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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 20-F
ANNUAL REPORT PURSUANT TO
SECTION 13 OR 15(d) OF
THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2020

Commission file number: 001-34175

ECOPETROL S.A.
(Exact name of Registrant as specified in its charter)

N / A
(Translation of Registrant's name into English)

REPUBLIC OF COLOMBIA
(Jurisdiction of incorporation or organization)

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Securities registered or to be registered pursuant to Section 12(b) of the Act.

Title of each class	Trading Symbol(s)	Name of each exchange on which registered:
American Depositary Shares (as evidenced by American Depositary Receipts), each representing 20 common shares par value COP\$ 609 per share	EC	New York Stock Exchange
Ecopetrol common shares par value COP\$ 609 per share		New York Stock Exchange (for listing purposes only)
5.875% Notes due 2023	EC23	New York Stock Exchange
4.125% Notes due 2025	EC25	New York Stock Exchange
6.875% Notes due 2030	EC30	New York Stock Exchange
5.375% Notes due 2026	EC26	New York Stock Exchange
7.375% Notes due 2043	EC43	New York Stock Exchange
5.875% Notes due 2045	EC45	New York Stock Exchange

Securities registered or to be registered pursuant to Section 12(g) of the Act: None

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act: None

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report.

41,116,694,690 Ecopetrol common shares, par value COP\$ 609 per share

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

☒ Yes ☐ No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.

☐ Yes ☒ No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

☒ Yes ☐ No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

☒ Yes ☐ No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definition of “large accelerated filer,” “accelerated filer,” and “emerging growth company” in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒

Accelerated filer ☐

Non-accelerated filer ☐

Emerging growth company ☐

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards[†] provided pursuant to Section 13(a) of the Exchange Act. ☐

[†] The term “new or revised financial accounting standard” refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark whether the registrant has filed a report on and attestation to its management’s assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

☒ Yes ☐ No

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

☐ U.S. GAAP

☒ International Financial Reporting Standards as issued by the International Accounting Standards Board

☐ Other

If “Other” has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow:

☐ Item 17 ☐ Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company
(as defined in Rule 12b-2 of the Exchange Act).

☐ Yes ☒ No

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1. Introduction

1.1 About This Annual Report

We file our Annual Report on Form 20-F and other information with the U.S. Securities and Exchange Commission.

We file reports, including annual reports on Form 20-F, and other information with the SEC pursuant to the rules and regulations of the SEC that apply to foreign private issuers. The materials included in this annual report on Form 20-F may be downloaded at the SEC's website: <http://www.sec.report>. Any filings we make are also available to the public over the Internet at the SEC's website at www.sec.gov and at our website at www.ecopetrol.com.co. (This URL is intended to be an inactive textual reference only. It is not intended to be an active hyperlink to our website. The information on our website, which might be accessible through a hyperlink resulting from this URL, is not and shall not be deemed to be incorporated into this annual report.)

Unless the context otherwise requires, the terms "Ecopetrol", "we", "us", "our", "Ecopetrol Group", or the "Company" are used in this annual report to refer to Ecopetrol S.A. and its subsidiaries on a consolidated basis.

For purposes of the section Business Overview—Exploration and Production, "we" refers to Ecopetrol S.A., its subsidiaries and the partnerships in which Ecopetrol has an interest.

References to the Nation in this annual report relate to the Republic of Colombia (Colombia), our controlling shareholder. References made to the Colombian government (or the Government) correspond to the executive branch including the President of Colombia, the ministries and other governmental agencies responsible for regulating our business.

1.2 Forward-looking Statements

This annual report on Form 20-F contains forward-looking statements within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. These statements are not based on historical facts and reflect our expectations for future events and results. Most facts are uncertain because of their nature. Words such as "anticipate", "believe", "could", "estimate", "expect", "should", "plan", "potential", "predicts", "prognosticate", "project", "target", "achieve" and "intend", among other similar expressions, are understood as forward-looking statements. We have made forward-looking statements that address, among other things:

- our exploration and production activities, including drilling;
- import and export activities;
- our liquidity, cash flow, and sources of funding;
- our projected and targeted capital expenditures and other cost commitments and revenues; and
- dates by which certain areas will be developed or will come on-stream.

Our forward-looking statements and sensitivity analysis are not guarantees of future performance and are subject to assumptions that may prove incorrect and to risks and uncertainties that are difficult to predict. Actual results could differ materially from those expressed or forecasted in any forward-looking statements as a result of a variety of factors. These factors may include, but are not limited to, the following:

- general economic and business conditions, including crude oil and other commodity prices, refining margins and prevailing exchange rates;
- competition;
- our ability to obtain financing;

- our ability to find, acquire or gain access to additional reserves and our ability to develop existing reserves;
- uncertainties inherent in making estimates of our reserves;
- significant political, economic and social developments in Colombia and other countries where we do business;
- natural disasters, pandemics and other public health events, including the coronavirus (“COVID 19”) pandemic, military operations, terrorist acts, wars or embargoes;
- regulatory developments, including regulations related to climate change;
- receipt of government approvals and licenses;
- technical difficulties; and
- other factors discussed in section Risk Review—Risk Factors of this document as “Risk Factors.”

All forward-looking statements attributed to us are qualified in their entirety by this cautionary statement. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information or for any other reason. Accordingly, readers should not place undue reliance on the forward-looking statements.

1.3 Selected Financial and Operating Data

The following table sets forth, for the periods and at the dates indicated, our selected historical financial and certain key operating data. The selected financial data has been derived from and should be read in conjunction with, and is qualified in its entirety by reference to, our consolidated audited financial statements, presented in Colombian Pesos.

Table 1 – Selected Operating Data

Operating Information	2020	2019	2018	2017	2016
Oil and gas production (mboed)	697.0	725.1	720.4	715.1	717.9
Proved oil and gas reserves (mmboe) ⁽¹⁾	1,770	1,893	1,727	1,659	1,598
Exploratory wells ⁽²⁾	18	20	17	20	6
Refinery throughput (bpd) ⁽³⁾	322,038	375,754	375,444	347,483	332,751
IP Reserves replacement ratio	48%	169%	129%	126%	(7)%

(1) Proved oil and gas reserves include natural gas royalties and exclude crude oil royalties.

(2) Gross exploratory wells.

(3) Refinery throughput includes the Barrancabermeja, Cartagena, Apiay and Orito refineries.

Financial Information

International Financial Reporting Standards (IFRS)

(Expressed in millions of Colombian Pesos, except for the net income per share, net operating income per share and dividends declared per share, which are expressed in Colombian Pesos, and common shares and weighted average shares outstanding, which are expressed as number)

Table 2 – Selected Financial Data

Financial Information	2020	2019	2018	2017	2016
Revenue	50,223,393	71,488,512	68,603,872	55,954,228	48,485,561
Operating income	7,181,765	21,027,158	22,458,414	16,171,855	8,904,548
Net income (loss) attributable to Ecopetrol's shareholders	1,586,677	13,744,011	11,381,386	7,178,539	2,447,881
Net operating income per share	175	511	546	393	217
Weighted average number of shares outstanding	41,116,694,690	41,116,694,690	41,116,694,690	41,116,694,690	41,116,694,690
Net income per share (basic and diluted)	39	334	277	175	59.5
Total assets	137,694,169	133,890,296	124,643,498	117,847,412	118,958,977
Total equity	53,499,363	58,231,628	57,107,780	48,215,699	43,560,501
Subscribed and paid-in capital	25,040,067	25,040,067	25,040,067	25,040,067	25,040,067
Number of common shares	41,116,694,690	41,116,694,690	41,116,694,690	41,116,694,690	41,116,694,690
Dividends declared per share	17	180	314	89	23
Total liabilities	84,194,806	75,658,668	67,535,718	69,631,713	75,398,476

Our consolidated financial statements for the years ended December 31, 2016, 2017, 2018, 2019 and 2020 were prepared in accordance with IFRS as issued by IASB. References in this annual report to IFRS mean IFRS as issued by the IASB.

IFRS differs in certain significant aspects from the current reporting standards as in effect in Colombia (Colombian IFRS), which is the accounting standard we use for local reporting purposes. As a result, our financial information presented under IFRS is not directly comparable to our financial information presented under Colombian IFRS. For a description of the differences between Colombian IFRS and IFRS, see section [Financial Review—Summary of Differences between Internal Reporting Policies and IFRS](#).

Our consolidated financial statements were consolidated line by line and all transactions and balances between subsidiaries have been eliminated. These financial statements include the financial results of all subsidiary companies controlled, directly or indirectly, by Ecopetrol S.A. See Exhibit 1 – [Consolidated companies, associates and joint ventures to our consolidated financial statements included in this annual report](#).

As indicated in IFRS 10 “Consolidated Financial Statements,” we must present our financial information on a consolidated basis as if we were a single entity, combining the financial statements of Ecopetrol S.A. and its subsidiaries line by line, adding assets, liabilities, shareholder's equity, revenues and expenses of similar nature, removing the reciprocal items among companies that are members of the Ecopetrol Group (Ecopetrol Group or EG) and recognizing non-controlling interest. We present our operating information on a consolidated basis in accordance with IFRS.

In this annual report, references to “US\$” or “U.S. dollars” are to United States dollars and references to “COP\$” “Colombian Peso” or “Colombian Pesos” are to Colombian Pesos, the Ecopetrol Group's functional and presentation currency under which we prepare our consolidated financial statements. This annual report translates certain Colombian Peso amounts into U.S. dollars at specified rates solely for the convenience of the reader. Unless otherwise indicated, such Colombian Peso amounts have been translated at the rate of COP\$3,691.27 per US\$1.00, which corresponds to the average *Tasa Representativa del Mercado* (TRM), or Representative Market Exchange Rate, for 2020. Such conversion should not be construed as a representation that the Colombian Peso amounts correspond to, or have been or could be converted into, U.S. dollars at that rate or any other rate. On April 5, 2021, the Representative Market Exchange Rate was COP\$3,679 per US\$1.00. Certain figures shown in this annual report have been subject to rounding adjustments, and, accordingly, certain totals may therefore not precisely equal the sum of the numbers presented. In this annual report a billion is equal to one with nine zeros.

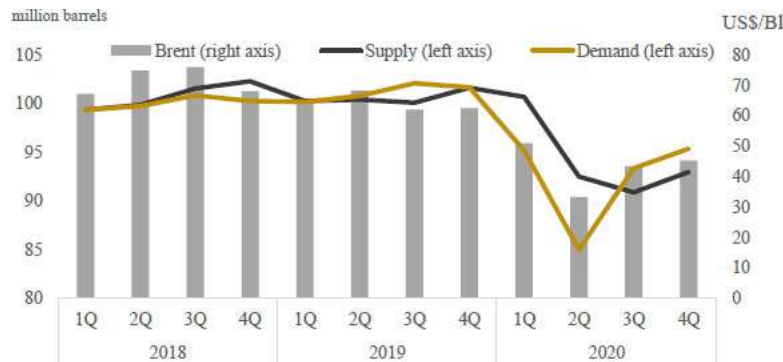
2. Strategy and Market Overview

Containment measures and economic disruptions related to the COVID-19 outbreak led to a slowdown in production and mobility worldwide, producing a significant drop in global demand for oil in 2020. Demand contracted for most refined products (especially jet fuel and gasoline), which brought the Brent price to US\$20/Bbl by the end of April 2020. Although demand recovered throughout the second half of the year, it did not reach pre-COVID-19 pandemic levels. The U.S. Energy Information Administration (EIA) estimates that demand contracted by 9.0 mmbd as compared to 2019, the largest annual decline registered in EIA data since 1980.

Oil supply slowly reacted to low prices. Moreover, a price war between Saudi Arabia and Russia in March and April further delayed the supply response. However, the Organization of the Petroleum Exporting Countries (OPEC) and its allies (including Russia) agreed to a supply cut at the end of April 2020. This, in conjunction with the drop in United States production, was key in balancing the oil market. In total, supply was reduced by 6.4 mmbd in 2020, of which OPEC's share was 4.1 mmbd, the US's share was 0.9 mmbd and the remaining 1.4 mmbd was contributed by others.

The drop in demand resulted in an increase in inventory and a decline in price during the first half of 2020. During much of the second half of the year, reduced oil production from the 14 OPEC member countries and ten of the world's major non-OPEC oil-exporting nations, including Russia (OPEC+) and the United States, along with a rising oil consumption, caused inventory to fall, driving Brent prices to a monthly average of US\$ 50/Bbl in December 2020.

Graph 1 – Supply/Demand Balance vs ICE Brent Price Evolution



Source: EIA: Short Term Report (January 2021)

Although international oil prices and global demand and supply dynamics are significant factors affecting our business and financial condition, Colombia's local economic factors have also influenced, and will continue to affect our performance, given that we conduct most of our business in Colombia.

The performance of Colombia's gross domestic product (GDP) is one of the main drivers of fuel consumption in Colombia. According to the National Administrative Department of Statistics (DANE for its acronym in Spanish), in 2020 Colombia's GDP fell 6.8% in real terms, as compared to 2019. The main reason for this contraction was derived from the COVID-19 pandemic and from the measures taken by the Colombian government to stop the spread of the virus, which included, among other measures, mandatory lockdowns and work slowdowns in certain industries. These measures particularly affected the construction, transportation, and mining industries, whereas the agriculture, financial services and real estate industries were still able to post positive growth rates along 2020. Within this context, local sales of liquid fuels decreased by 19.9% during 2020, primarily due to lower diesel and gasoline demand.

Natural gas demand in Colombia decreased by 1.4% in 2020 compared with 2019, due to lower demand from the industrial sector and refineries. In 2020, the natural gas market was challenged from the supply side itself, primarily due to the decrease in demand needs due to the COVID-19 pandemic, the latter generated several blockades and quarantines in different countries leading to a decrease in natural gas requirements for electricity generation as in the industrial sector. Additionally, it faced the harshness of the hurricane season in the Gulf of Mexico, which also forced the suspension of the mobilization of LNG ships, causing some terminals to suspend their operations. During the months of May to July, natural gas prices for Hubs such as TTF and JKF reached similar ranges to the ones of Henry Hub, placing them in ranges between US\$1.43 – US\$ 2.38 million British thermal unit (MMBtu). However, these same markers showed a significant recovery by the end of 2020, primarily due to the commencement of the winter season, leading to the production of natural gas from the Gulf of Mexico turning to serve the Asian market.

2.1 Our Corporate Strategy

2.1.1 2021 – 2023 Business Plan

The Ecopetrol Group's Organic Business Plan (the "Business Plan") for the 2021-2023 period, is aimed at restoring the Ecopetrol Group's growth trajectory post COVID-19, increasing competitiveness, laying the foundations of energy transition and going deeper into the Technology, Environment, Social and Governance (TESG) agenda through positive social and environmental impact in the territories where we operate. The Business Plan also seeks to maintain the effective response of the Ecopetrol Group to uncertain economic and environmental conditions, ensure the financial sustainability of the Ecopetrol Group and keep the value promise to stakeholders in the medium and long terms. The organic investment included in the Business Plan is expected to be financed mainly with internal cash generation. The Brent price assumptions under the Business Plan are as follows: US\$ 45/BI in 2021, US\$ 50/BI in 2022 and US\$ 54/BI in 2023.

The Business Plan features an organic investment between US\$ 12 billion and US\$ 15 billion for the three-year period, mainly focused in Colombia, and seeks to ensure capital allocation towards incorporation of more competitive reserves and resources within a new scenario of oil and gas prices, competitive positioning in the energy transition (such as gas, decarbonization, short-cycle hydrocarbons and the incorporation of renewable energies), reliability investments necessary for a responsible and sustainable operation, and strategic technologies and social investment for the future of the Ecopetrol Group.

76% of the investments are expected to be allocated towards growth opportunities aimed at continuing the exploration and profitable development of existing assets and accelerating adaptation to the energy transition, with investments focused on the continuation of the enhanced recovery programs and the growth of the gas value chain. The remaining 24% of investments are expected to be allocated to operational continuity, seeking to preserve the value of the assets and bring reliability and integrity to the Ecopetrol Group's consolidated operations.

The most relevant operational goals of the Business Plan are the following: (i) to reach production levels between 700 and 710 thousand barrels of oil equivalent per day in 2021, with a growth trajectory that allows the Ecopetrol Group to reach production levels of approximately 750 thousand barrels of oil equivalent per day by 2023; (ii) to reach a joint throughput at the Barrancabermeja and Cartagena refineries of between 340 and 365 thousand barrels per day in 2021, with a growth path that allows reaching a joint throughput at such refineries of approximately 420 thousand barrels per day by 2023 in an expected scenario of recovery in demand and refining margins, as well as the interconnection of the crude plants at the Cartagena refinery; and (iii) to reach transported volumes of over one million barrels per day – in line with the evolution of the production and demand for liquid fuels in the country.

Upstream

In terms of the upstream segment, the Business Plan allocates an investment range of between US\$ 9 billion and US\$ 11 billion. The Business Plan maintains the growth of this segment as a strategic objective, with a focus on accelerating the progression of resources and reserves, through exploration, drilling and enhanced recovery.

Of the aforementioned resources, (i) 69% is expected to be allocated in production activities, including the Rubiales, Castilla, Piedemonte and the Middle Magdalena Valley fields, with a continued focus on maturity and development of improved recovery activities, (ii) 22% is expected to be allocated internationally, where the main focus areas will be Brazil and the Permian Basin in the United States and (iii) 9% of the resources are expected to be allocated in exploration activities, with an expected drilling of more than 40 wells located in the basins of greater materiality, with emphasis on the Llanos Orientales, Middle Magdalena Valley, Lower Magdalena Valley and Sinú-San Jacinto areas.

In terms of unconventional reservoirs, the Ecopetrol Group will continue the development process for the initiatives associated to the Comprehensive Research Pilot Projects (*PPII for its Spanish acronym*) in the Middle Magdalena valley basin in Colombia, and well as increasing development activities in the Permian Basin in Texas.

Regarding the growth of the natural gas chain (one of the Ecopetrol Group's strategic pillars), between 9% and 10% of the investment called for by the Business Plan is expected to be allocated towards the development of Piedemonte and other sources of gas in the Middle Magdalena Valley, Guajira and the Sinú-San Jacinto basin areas in Colombia. Additionally, the Business Plan calls for investments for the evaluation and development of the largest offshore gas discoveries in the Colombian Caribbean.

The Business Plan foresees the achievement of reserves replacement ratio greater than 100% after 2022. However, such goal is subject to revision based on the evolution of both the Business Plan and market conditions.

Midstream

In terms of the midstream segment, the Business Plan allocates an investment of between US\$ 780 million and US\$ 960 million, mainly aimed at strengthening the integrity and reliability of the infrastructure, prioritizing resources for the growth of the multi-pipeline business, while advancing in increasing flexibility and efficiency in logistics for the evacuation of heavy crude and the growth of the pipeline infrastructure. These investments are also expected to enable future operating costs optimization by upgrading equipment and improving its performance.

Downstream

In terms of the downstream segment, the Business Plan allocates an investment between US\$ 1.2 billion and US\$ 1.4 billion focused on ensuring (i) the integrity and competitiveness of existing assets, and (ii) compliance with the fuel quality path. Regulatory compliance investments and major maintenance investment are expected to be made a part of the compliance with the life cycle of the plants in the Cartagena and Barrancabermeja refineries. The expected investments also call for the execution of the final phase of the interconnection project of the crude plants of the Cartagena refinery in an aggregate amount of approximately US\$ 77 million, which is expected to commence operations in 2022.

In order to advance with the production of cleaner fuels for the country, investments in the 2021-2023 period are expected to make possible to guarantee sustained internal quality of diesel of between 10 and 15 ppm of sulfur, and to bring gasoline to a maximum of 50 ppm of sulfur across Colombia.

Commercial Strategy

The Business Plan maintains the Ecopetrol Group's strategy of diversifying clients and destinations, with an important emphasis on the independent refining sector in China, while maintaining an active participation in the refining market of the United States. The foregoing is expected to be leveraged on our operational flexibility at ports, a stable quality of our crude oil and optimization of logistics.

In terms of TESG, the Business Plan allocates approximately COP\$ 1.7 trillion for the 2020-2024 period for social and environmental investment, aimed at closing social gaps and promoting the development and well-being of the communities where the Ecopetrol Group operates, with strategic projects expected in infrastructure, public services, education, sports and health, inclusive rural development and entrepreneurship and business development. Additionally, support will continue to be provided with resources in order to meet the COVID-19 pandemic needs of the communities and areas where the Ecopetrol Group operates.

Between US\$ 100 million and US\$ 150 million are expected to be allocated to the development of the Ecopetrol Group's digital strategy, in order to capture benefits related to artificial intelligence technologies, block chain and bots, among others. Furthermore, we expect to invest between US\$70 million and US\$110 million in projects to increase the recovery factor, energy transition and strategic studies on water issues and new materials.

In connection with the Ecopetrol Group's energy transition strategy, the Business Plan allocates investments of more than US\$600 million in initiatives focused on the decarbonization agenda, among which stand out solar, wind and geothermal energy projects, followed by energy efficiency and fuel quality projects, among others. Similarly, in March 2021, intermediate and long-term emissions reduction goals and achievement plan were defined in line with the Ecopetrol Group's growth strategy.

In 2021, the Ecopetrol Group also expects to consolidate its evaluation of opportunities associated with the hydrogen value chain and will seek to materialize partnerships in international agreements and with governments to identify business opportunities.

For more information on the TESG agenda see section entitled *Technology, Environment, Social and Governance (TESG) Strategies and Initiatives*.

2.1.1.1 Energy Transition

To acknowledge the risks and opportunities that transitioning to a low carbon economy implies for the Ecopetrol Group, we have defined four lines of action, including the aforementioned, to face the energy transition, as described below:

- (i) Continue strengthening the competitiveness of the oil and gas business: The Ecopetrol Group plans to gain resilience in the oil and gas portfolio, which is expected to continue to be our core activities until the peak in oil demand is reached, while increasing its commitment to new businesses resilient to the energy transition.
- (ii) Diversification of our business portfolio into low-carbon businesses: The Ecopetrol Group is exploring new business opportunities in the electricity value chain specifically in the energy transmission market as well as other potential future low-carbon businesses such as green hydrogen, carbon capture, utilization and storage (CCUS), nature-based solutions, among others, as long as that they meet the Ecopetrol Group's growth, cash protection, and capital discipline criteria.
- (iii) Achievement of decarbonization targets: Focused on accelerating and prioritizing energy efficiencies and reductions in carbon emissions the Ecopetrol Group plans on achieving the decarbonization goals mentioned in the section entitled *Technology, Environment, Social and Governance (TESG) Strategies and Initiatives*. Such targets are aligned with the Ecopetrol Group's objectives of reducing the carbon emissions associated with its operations, as well as reducing the vulnerability of its operation and infrastructure to climate change.
- (iv) Achievement of sustainability through the TESG strategy: The Ecopetrol Group's TESG strategy places a clear focus on climate change (including decarbonization targets), water management, and territorial development as well as biodiversity, circular economy, health, safety and environmental (HSE) practices and diversity, leveraged on technology as a key enabler.

Oil and gas companies are evaluating options to reposition themselves along the energy value chain in new business segments aligned with the market trends towards decarbonization and electrification, such as renewable generation, commercialization, and services to end customers, among others. It is Ecopetrol's view that the need to connect and integrate multiple points and types of generation will reinforce the role of transmission as an indispensable actor in the energy value chain, and a required enabler of the growth of clean generation and electrification.

Our announced interest in acquiring a 51.4% stake in Interconexión Eléctrica S.A. (ISA) is part of this strategy as it would allow us to achieve a relevant position in a strategic sector for the energy transition. Through a single transaction, we would position ourselves in a key link in the electricity business with clear prospects for future growth. For more information on this potential transaction see the section entitled [Business Overview-Recent Developments](#).

2.1.2 2021 Investment Plan

In December 2020, the Board of Directors approved between US\$ 3.5 billion and US\$ 4.0 billion for the 2021 investment plan at US\$ 45/Bt Brent. The Ecopetrol Group plans to produce between 700 and 710 thousand barrels of oil equivalent per day during 2021. The Ecopetrol Group expects to allocate 80% percent of these investments to projects in Colombia and the remainder to the positioning and development of the Ecopetrol Group's operations in the United States and Brazil.

The table below sets forth the details of the investment plan per business segment announced in December 2020:

Table 3 – 2021 Investment Plan

Business Segment	% Percentage ⁽¹⁾
Exploration	6%
Production	71%
Midstream	7%
Downstream	11%
Other	5%
TOTAL	100%

(1) Percentage over the upper range.

2.2. Unconventional Energy Sources

Ecopetrol's strategy for unconventional resources is based on the significant acreage position it has in the Middle Magdalena Basin in Colombia. In September 2019, the Colombian Council of State authorized the execution of the PPII to do the research on the eventual effects of using unconventional technology and made mandatory recommendations in respect of the pilot stage. However, a final decision on the development of unconventional reservoirs will not be issued until the government has evaluated the PPII results.

On February 28, 2020, the Ministry of Mines and Energy issued Decree 328 providing the general guidelines for developing PPII on unconventional reservoirs. Furthermore, on December 24, 2020, Ecopetrol signed a contract with the Agencia Nacional de Hidrocarburos - National Hydrocarbons Agency (the "ANH") in respect of a pilot program in the Middle Magdalena Basin pursuant to which the potential environmental and social impacts are to be evaluated and the multi-stage hydraulic fracturing in horizontal wells concept is to be assessed.

3. **Business Overview**

3.1 **Our History**

We were formed in 1951 by the Colombian government as *Empresa Colombiana de Petróleos* and began operating the crude oil fields at La Cira-Infantas, the oldest Colombian oil field, where production started in 1918, and the pipeline that connected that field with the Barrancabermeja refinery and the port of Cartagena. In 1961, we assumed the direct operation of the Barrancabermeja refinery and continued its transformation into an industrial complex. In 1974, we acquired the Cartagena refinery (as defined below), which had been in operation since 1957. Pursuant to Decree 0062 of 1970, we were transformed into a governmental, industrial and commercial company.

In 2003, pursuant to Decree Law 1760, the *Agencia Nacional de Hidrocarburos* - National Hydrocarbons Agency (the ANH) was created and Ecopetrol's public role as administrator and regulator of the national hydrocarbons resources was transferred to the ANH. Ecopetrol modified its organic structure and became Ecopetrol S.A., a publicly-held corporation, one hundred percent state-owned, and continued the development of exploration and production activities in a competitive basis with autonomy over business decisions. Since 2006, according to Law 1118, we have been evolving from a wholly state-owned entity to a mixed-economy company with private capital. This process has resulted in a substantial change in the legal framework to which we are subject and in the nature of our relationship with the Nation, as our controlling shareholder.

We carried out our initial public offering in November 2007, when our common shares were listed on the Colombian Stock Exchange. Our American Depositary Shares (ADSs) were listed on the New York Stock Exchange in 2008.

3.2 **Our Corporate Structure**

We operate in the following business segments: (i) Exploration and Production; (ii) Transportation and Logistics; (iii) Refining, Petrochemicals and Biofuels; and (iv) Sales and Marketing.

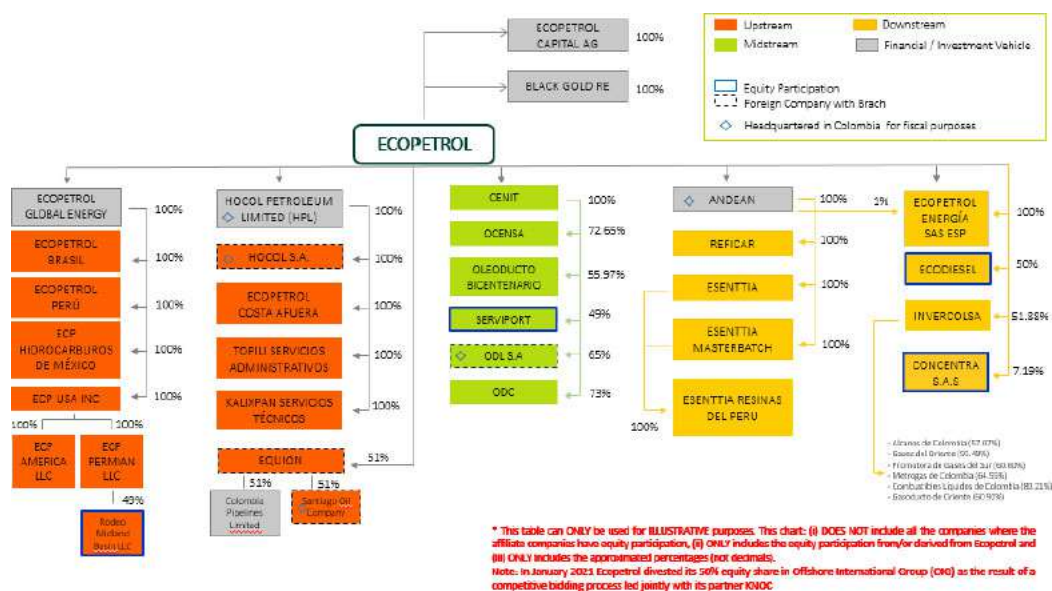
Our subsidiaries, Refinería de Cartagena S.A.S. (Reficar or Cartagena Refinery), Cenit Transporte y Logística de Hidrocarburos S.A.S. (Cenit) and Oleoducto Central S.A. (Ocensa) are significant subsidiaries, as such term is defined under SEC Regulation S-X.

We have a number of directly and indirectly held subsidiaries both in Colombia and abroad. As of December 31, 2020, we have eight directly owned and 19 indirectly owned subsidiaries.

During 2020, the following changes were made to the Ecopetrol Group's structure:

- (i) On March 10, 2020, Bioenergy and Bioenergy Zona Franca S.A.S. were admitted to reorganization processes by the Superintendence of Companies under Law 1116 of 2006. The reorganization ended on June 24, 2020, with the applicable regulatory authority ordering the judicial liquidation processes for both companies. Furthermore, as these entities were not material subsidiaries and are not currently under our control, these processes did not have a material adverse effect on Ecopetrol's results of operations or financial condition. For further information see section Risk Review—*Legal Proceedings and Related Matters*.
- (i) On December 18, 2020, the liquidation process of ECP Germany Oil and Gas GmbH was completed, with no material adverse effect on Ecopetrol's consolidated results.

Graph 2 – Ecopetrol's Corporate Structure⁽¹⁾



The stock ownership percentage listed refers to Ecopetrol S.A.'s direct and indirect participation as of December 31, 2020. The data in this structure shows neither the whole ownership nor its decimal figures, so they will be used only for information purposes.

Exhibit 8.1 to this annual report identifies our principal operating subsidiaries, their respective countries of incorporation, and our percentage ownership in each (both directly and indirectly through other subsidiaries).

3.3 Recent Developments

Sale of Ecopetrol's stake in Offshore International Group

On January 19, 2021, Ecopetrol signed a Share Purchase Agreement with De Jong Capital LLC, through one of its subsidiaries as buyer, pursuant to which Ecopetrol sold its 50% ownership interest in Offshore International Group (OIG). This divestment was the result of a competitive process between a number of bidders, jointly carried out by Ecopetrol and its partner, in respect of the sale of 100% of the capital stock of OIG.

Non-binding offer to acquire 51.4% of ISA's outstanding shares

On January 27, 2021, Ecopetrol announced its interest in acquiring 51.4% of the outstanding shares of ISA, currently owned by the Colombian Ministry of Finance and Public Credit (MHCP by its Spanish acronym). Ecopetrol is pursuing this transaction with a view that an equity stake in ISA can materially increase its exposure to global trends in electrification and decarbonization, provide access to growth opportunities and improve its risk profile by adding stable cash flows to the Ecopetrol Group's revenue composition. The transaction is expected to be funded through a combination of equity to be issued, in which the MHCP would maintain at least 80% of Ecopetrol's share ownership, cash from operations and/or other financing alternatives available to Ecopetrol. To the extent we decide to finance the ISA acquisition through an equity offering, we are analyzing whether to offer preemptive or similar rights to our existing shareholders.

ISA operates and maintains transmission networks in Colombia, Peru, Bolivia, Brazil and Chile, among others, and participates through its subsidiaries in the toll-road business, telecommunications and management of real-time systems. Based on its public reports as filed with the *Superintendencia Financiera de Colombia* (the "SFC"), ISA's consolidated operational revenues and net income for 2020 totaled COP 10.2 trillion and COP 2.1 trillion, respectively; and its total assets were COP 54.0 trillion as of December 31, 2020. As of March 31, 2021, ISA's market capitalization as reported on the Colombian Stock Exchange (BVC) was COP 24.9 trillion.

On February 12, 2021, Ecopetrol and the MHCP signed an exclusivity agreement through which the parties will carry out non-binding preliminary conversations on the terms and conditions of the potential transaction. The exclusivity period is initially scheduled to end on June 30, 2021 unless extended by mutual agreement of the parties. During this period, Ecopetrol will carry out a detailed due diligence of ISA and the MHCP has agreed to negotiate exclusively with Ecopetrol.

Although the Colombian Government, through the MHCP, is the majority shareholder of both ISA and Ecopetrol, and will be acting as seller in the proposed transaction for Ecopetrol's acquisition of ISA's shares, the transaction has been structured and negotiations will be carried out on an arm's length basis, with seller and buyer independent from each other. Ecopetrol and the Colombian Government will each engage their own financial and legal counsel for purposes of carrying out this transaction. In addition, for purposes of determining ISA's valuation, Ecopetrol has engaged two experienced investment banking firms. Ecopetrol intends to engage a separate independent advisor to deliver a fairness opinion related to ISA's valuation and Ecopetrol's final purchase price proposal. Moreover, the Board of Directors of Ecopetrol, which is composed by a majority of independent members, retains full oversight and autonomous decision rights over Ecopetrol's interest in the transaction.

In line with the aforementioned, on March 25, 2021, the Ecopetrol Group's Board of Directors approved the establishment of a Special Committee that will act as a temporary mechanism to evaluate the valuation of ISA, the price range and/or the price of the potential transaction and make the necessary recommendations to the Board of Directors. The committee will be comprised of the following independent members of Ecopetrol's Board of Directors:

- Carlos Gustavo Cano
- Sergio Restrepo
- Esteban Piedrahita
- Santiago Perdomo, who will chair the committee

For information on the regulation of the electricity sector in Colombia, see section Applicable Laws and Regulations—*Regulation of the Electric Energy Commercialization Activity and Regulation of the Electricity Self-Generation Activity*.

The potential acquisition of a percentage of ISA's shares would be subject to the approval of the Ecopetrol's Board of Directors. Likewise, the required authorizations from regulatory and supervisory entities in Colombia and other countries in which ISA has operations are being evaluated.

3.4 Our Business

We are a vertically integrated oil and gas company with presence primarily in Colombia and with activities in the U.S., Brazil and Mexico. The Nation currently owns 88.49% of our voting capital stock. We are among the world's largest public companies, ranking 313 on the Forbes Global 2000 Ranking – 2020, and the largest Colombian company in this ranking. We play a key role in the local Colombian hydrocarbon market.

3.5 Exploration and Production

Our exploration and production business segment includes exploration, development and production activities in Colombia and abroad. We began local exploration in 1955 and international exploration in 2006. Exploration and production activities are conducted directly by Ecopetrol S.A., and through some of our subsidiaries, as well as through joint ventures with third parties. As of December 31, 2020, we were the largest operator and the largest producer of crude oil and natural gas in Colombia, maintaining the largest acreage exploration position in Colombia.

Unless otherwise stated, all figures are given before deducting royalties.

3.5.1 *Exploration Activities*

Under our Business Plan, Ecopetrol is aiming to incorporate resources in high reward projects concentrated in: (i) near field exploratory activity, (ii) underexplored onshore basins in Colombia, such as Putumayo and Piedemonte, (iii) offshore Colombia, and (iv) international areas such as offshore Brazil in Pre-salt Santos and the U.S. Gulf of Mexico.

Graph 3 – Sedimentary basins where Ecopetrol executes exploration activities



During 2020, the exploration strategy was directed at leveraging our goal on three working fronts: onshore Colombia, offshore Caribbean, and strengthening our exploration overseas.

3.5.1.1 Exploration Activities in Colombia

During 2020, Ecopetrol and its subsidiaries drilled sixteen (16) wells in Colombia, of which ten (10) were exploratory and six (6) were appraisal wells. As of December 31, 2020, two (2) wells were successful, five (5) were plugged and abandoned, and nine (9) were under evaluation. This activity was concentrated mainly in the following basins: Llanos, Lower Magdalena Valley, Middle Magdalena Valley, Upper Magdalena Valley and Sinú San Jacinto.

In 2020, Ecopetrol participated in the drilling of two (2) successful wells in Colombia:

- (i) the Cayena-1 ST1 well, drilled at sole risk by our partner Parex Resources in the Fortuna Association contract (where Ecopetrol holds a 20% working interest and Parex Resources, as the operator, holds the remaining 80% working interest); and
- (ii) the Arrecife-3 well, where Ecopetrol holds a 100% working interest, through its subsidiary Hocol, at the VIM 8 Block.

Furthermore, during 2020 the Mercumbé-1 well was tested and declared successful after showing gas production in the Chengue Formation. This well was drilled by Lewis Energy in partnership with our subsidiary Hocol in 2019. As of the date of this annual report, this well is closed and under evaluation.

The following table sets forth, for the periods indicated, the number of gross and net productive, dry and under evaluation exploratory wells drilled by us and our joint venture partners, and the exploratory wells drilled by third parties pursuant to sole risk contracts with us.

Table 4 – Exploratory Drilling in Colombia

	For the year ended December 31,		
	2020	2019	2018
	(Number of wells)		
COLOMBIA			
Ecopetrol S.A			
Gross exploratory wells			
Owned and operated by Ecopetrol			
Productive	-	1.0	
Dry ⁽¹⁾	2.0	1.0	-
Under Evaluation ⁽²⁾⁽³⁾	1.0	-	-
Total	3.0	2.0	-
Operated by a partner in Joint Venture			
Productive	-	4.0	5.0
Dry ⁽¹⁾	-	1.0	1.0
Under Evaluation ⁽²⁾	1.0	1.0	3.0
Total	1.0	6.0	9.0
Operated by Ecopetrol in Joint Venture			
Productive	-	-	-
Dry ⁽¹⁾	-	-	-
Under Evaluation ⁽²⁾	2.0	-	1.0
Total	2.0	-	1.0
Net Exploratory Wells ⁽⁴⁾			
Productive	-	2.8	1.9
Dry ⁽¹⁾	2.0	1.4	0.3
Under Evaluation ⁽²⁾	2.5	0.4	2.0
Total	4.5	4.6	4.2
Sole Risk			
Productive	1.0	1.0	-
Dry ⁽¹⁾	1.0	5.0	2.0
Under Evaluation ⁽²⁾⁽⁵⁾	3.0	-	-
Total	5.0	6.0	2.0
Hocol			
Gross Exploratory Wells			
Productive	1.0	1.0	1.0
Dry ⁽¹⁾	2.0	2.0	4.0
Under Evaluation ⁽²⁾	2.0	2.0	-
Total	5.0	5.0	5.0
Net Exploratory Wells ⁽⁴⁾			
Productive	1.0	0.5	1.0
Dry ⁽¹⁾	2.0	2.0	3.2
Under Evaluation ⁽²⁾	1.0	1.0	-
Total	4.0	3.5	4.2

(1) A dry well or hole is an exploratory well found to be incapable of producing either crude oil or natural gas in sufficient quantities to justify completion as a crude oil or natural gas well.

(2) An “under evaluation” well is an exploratory well where there is not yet enough information to determine its result as successful or dry. This classification is maintained until additional well testing operations are carried out to determine the hydrocarbon production capacity or some petrophysical parameter of the rocks or fluids in the reservoir.

(3) The Flamencos-2 well was classified as “under evaluation” for the year ended December 31, 2020. However, as of January 2021, it has been declared successful.

(4) Net exploratory wells were calculated according to our percentage of ownership in these wells.

(5) The El Niño-1 well was classified as “under evaluation” for the year ended December 31, 2020. However, as of January 2021, it has been declared successful.

As a result of our divestment strategy, Hocol transferred 50% of its interest to Lewis Energy for the exploration of natural gas in a frontier play in the Perdices block. Additionally, the Agencia Nacional de Hidrocarburos approved the transfer of our 50% working interest in the COL-5, Purple Angel and Fuerte Sur blocks, where the Gorgon and Kronos gas discoveries are located, to Shell. With the arrival of a new operator with deep-water offshore experience, offshore drilling will recommence with an appraisal well, Gorgon-2, in December 2021. The appraisal well will be drilled in a 2,400 meters water depth, with an expected total depth of 4,543 meters. In case of success, additional drilling is to follow, with the expectations of accelerating the development of this material gas discovery.

Seismic

In Colombia, Ecopetrol purchased 273 km² of 3D seismic and 1,328 km of 2D seismic surveys in the Llanos, Middle Magdalena Valley and Upper Magdalena Valley basins, with the objective of improving our geological understanding of these prolific basins.

3.5.1.2 Exploration Activities Outside Colombia

Our international exploration strategy aims to expand and renew our exploration portfolio in basins with long term potential, dilute our risks and improve the possibility of increasing our reserves. Some key aspects of this strategy include participating in bidding rounds to secure blocks available for exploration and entering into joint ventures with international and regional oil companies that contribute with operational expertise and technology.

In 2020, Ecopetrol America LLC signed a cross-assignment with Chevron, through which new blocks in the US Gulf of Mexico were acquired and participation in other blocks was transferred to Chevron. As a result, Ecopetrol America LLC was able to diversify its portfolio while reducing risk and capital exposure.

On June 12, 2020, Ecopetrol Óleo e Gás do Brasil Ltda. officially entered the Gato do Mato discovery in the Brazilian Pre-Salt, located in the BM-S-54 and Sul de Gato do Mato blocks, where Ecopetrol holds a 30% working interest, Total holds a 20% working interest and Shell as the operator holds the remaining 50% working interest. The Gato do Mato-4 appraisal well was drilled and was declared successful.

In the pre-salt of the Santos Basin, Ecopetrol Óleo e Gás do Brasil Ltda. also drilled, together with its partners Shell (as operator) and Chevron, the Saturno-1 well, which was declared a dry hole. Further technical evaluations are being carried out during 2021 to decide the path forward with regards to remaining potential in the Saturno exploration block.

The following table sets forth information on our international exploratory drilling for the periods indicated.

Table 5 – Exploratory Drilling Outside Colombia

	For the year ended December 31,		
	2020	2019	2018
	(Number of wells)		
UNITED STATES			
Ecopetrol America LLC			
Gross exploratory wells			
Productive	-	1.0	-
Dry ⁽¹⁾	-	-	-
Under Evaluation ⁽²⁾	-	-	-
Total	-	1.0	-
Net Exploratory Wells ⁽³⁾⁽⁴⁾			
Productive	-	0.2	-
Dry ⁽¹⁾	-	-	-
Under Evaluation ⁽²⁾	-	-	-
Total	-	0.2	-
BRAZIL			
Ecopetrol Óleo e Gás do Brasil Ltda.			
Gross exploratory wells			
Productive ⁽⁵⁾	1.0	-	-
Dry ⁽¹⁾	1.0	-	-
Under Evaluation ⁽²⁾	-	-	-
Total	2.0	-	-
Net Exploratory Wells ⁽³⁾⁽⁴⁾			
Productive	0.3	-	-
Dry ⁽¹⁾	0.1	-	-
Under Evaluation ⁽²⁾	-	-	-
Total	0.4	-	-

(1) A dry well or hole is an exploratory well found to be incapable of producing either crude oil or natural gas in sufficient quantities to justify completion as a crude oil or natural gas well.

(2) An “under evaluation well” is an exploratory well where there is not yet enough information to determine its result as successful or dry. This classification is maintained until additional well testing operations are carried out to determine the hydrocarbon production capacity or some petrophysical parameter of the rocks or fluids in the reservoir.

(3) Net exploratory wells were calculated according to our percentage of ownership in these wells.

(4) None of our international wells were drilled pursuant to a sole risk contract.

(5) Gato do Mato-4 appraisal well was drilled before Ecopetrol Brasil formal entrance into the joint venture with Shell, while pending the governmental authorities’ approval. Therefore, the well expenditure was part of the acquisition cost under the sale and purchase agreement executed between Ecopetrol Brasil and Shell Brasil Petróleo Ltda. Due to that, the Gato do Mato-4 well cost was recorded as “acquisition cost” in the 2020 financial statements of Ecopetrol Brasil.

Seismic

Our subsidiary, Ecopetrol America LLC, purchased 2,423 km² of 3D seismic data to evaluate the exploratory potential of 77 U.S. Gulf of Mexico blocks, and to further evaluate the discovery made with the Esox-1 well drilled in 2019.

3.5.2 *Production Activities*

In 2020, our consolidated average production was 697 thousand barrels of oil equivalent per day (boepd), a decrease of 28 thousand boepd as compared to 2019. This was primarily due to the following factors: (i) the effects of the COVID-19 pandemic, which caused a significant reduction in oil and gas demand, (ii) the drop in oil prices which led to a slowdown in activity and investment, and (iii) public order issues caused by the slowdown in the economy, impacting our operations in different regions. The aforementioned situations were reflected in the temporary closure of some wells, negatively affecting the production of some fields. However, as of the date of this annual report, all affected wells have been reactivated.

The following table summarizes the results of our oil and gas production activities for the periods indicated:

Table 6 – Ecopetrol Group's Oil and Gas Production

	For the year ended December 31,								
	2020			2019			2018		
	Oil	Gas ⁽¹⁾	Total	Oil	Gas ⁽¹⁾	Total	Oil	Gas ⁽¹⁾	Total
	(Thousand boepd)								
Total gross production in Colombia ⁽²⁾	537.4	138.1	675.5	576.6	130.5	707.1	578.4	125.0	703.4
Total international gross production ⁽³⁾	17.4	4.2	21.5	15.0	3.0	18.0	14.1	2.9	17.0
Total gross production of Ecopetrol Group	554.7	142.3	697.0	591.6	133.5	725.1	592.5	127.9	720.4
Total production of Ecopetrol Group for presentation of reserves⁽⁴⁾	508.5	138.8	647.3	528.9	133.7	662.6	524.3	129.8	654.1

(1) Conversion between million cubic feet per day (mcfpd) and boepd is performed at 5,700 mcfpd to 1 boepd.

(2) Total production in Colombia corresponds to Ecopetrol S.A., Hocol and Equion (until February 2020). Includes royalties.

(3) Total international production corresponds to Ecopetrol Permian LLC, Savia Perú and Ecopetrol America LLC. Includes royalties.

(4) For the Company's presentation of reserves, the Company deducts from its total gross production the 100% of crude royalties from Ecopetrol Group companies and gas royalties from non-Colombian Ecopetrol Group companies, Savia Perú S.A. (Peru), Ecopetrol Permian LLC (United States) and Ecopetrol America LLC (United States). Gas royalties derived from Colombian production are not deducted because according to local regulation the Company is entitled to such gas royalties. Also includes self-consumption, which is only comprised of natural gas self-consumption and is immaterial. Oil production include NGL, which is immaterial.

3.5.2.1 *Production Activities in Colombia*

3.5.2.1.1 *Ecopetrol S.A.'s Production Activities in Colombia*

For the year ended December 31, 2020, Ecopetrol S.A. was the largest participant in the Colombian hydrocarbons industry, accounting for approximately 66.1% of crude oil production and 55.6% of natural gas production (calculations based on information from the Ministry of Mines and Energy). During 2020, Ecopetrol S.A. completed the drilling of 201 development wells, mainly in the Central and Orinoquía regions (156 through direct operations and 45 through associated companies).

Ecopetrol S.A. manages its production operations through a regional organization, which comprises a total of 79 oil fields with active production in 2020:

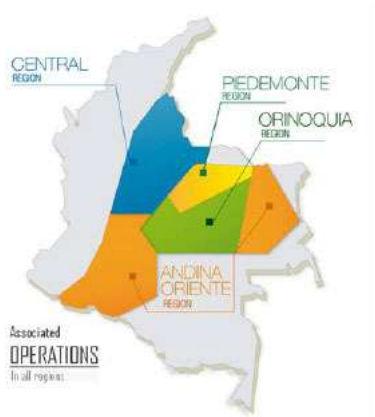
- Central Region
- Orinoquía Region
- Andina Oriente Region (resulting from the integrations of the former Oriente and South regions)
- Piedemonte Region

Additionally, we operate 104 fields with active production through Associated Operations with different partners.

In February 2020, the Vice-Presidency of Gas was created in order to lead and execute the Ecopetrol Group’s integrated gas strategy.

The map below shows the locations of Ecopetrol S.A.’s operations by regions.

Graph 4 – Ecopetrol S.A. Operations in Colombia



Note: Associated Operations are conducted through a countrywide Vice-presidency of Associated Operations.

Crude Oil Production

The average daily production of crude oil in Colombia by Ecopetrol S.A. (excluding its subsidiaries), was 516 mbod in 2020, 32 mbod lower than in 2019, which represents a year-to-year decrease of 6%.

The following chart summarizes Ecopetrol S.A.’s average daily crude oil production in Colombia by region, prior to deducting royalties, for the periods indicated.

Table 7 – Ecopetrol S.A.'s Average Daily Crude Oil Production in Colombia by Region

	For the year ended December 31,		
	2020	2019	2018
	(Thousand bpd)		
Central Region			
La Cira – Infantas	19.51	25.90	28.10
Casabe	13.11	13.20	13.90
Yarigui	18.90	17.90	14.40
Other	16.95	15.90	17.30
Total Central Region	68.47	72.90	73.70
Orinoquía Region			
Castilla	112.22	114.10	113.90
Chichimene	68.80	69.10	67.70
CPO-09	5.25	10.90	4.50
Apiay	6.33	7.30	7.60
Other	7.16	5.60	4.40
Total Orinoquía Region	199.76	207.00	198.10
Piedemonte Region			
Floreña ⁽¹⁾⁽²⁾	25.54	22.70	25.90
Cupiagua ⁽³⁾	6.22	7.20	8.30
Cusiana ⁽³⁾	2.13	3.10	4.00
Total Piedemonte Region	33.90	33.00	38.20
Andina Oriente Region⁽⁴⁾			
Rubiales	106.27	119.30	119.50
Caño Sur	5.06	4.50	3.20
San Francisco	4.05	6.20	6.00
Huila Area	5.55	3.80	3.50
Tello	4.33	3.40	3.60
Other	7.50	10.40	11.70
Total Andina Oriente Region	132.77	147.60	147.50
Associated Operations			
Quifa	14.73	20.50	21.20
Caño Limon	24.14	25.70	25.30
Nare	9.53	10.90	12.00
Floreña ⁽¹⁾⁽²⁾	2.62	-	-
Other	30.15	30.40	32.70
Total Associated Operations	81.17	87.50	91.20
Total average daily crude oil production Ecopetrol S.A. (Colombia)	516.03	548.00	548.70

(1) The Piedemonte fields changed their name to the Floreña fields as of December 2020.

(2) The Floreña fields were included in Associated Operations until February 2020, when the association contract with Equión ended. Starting in March 2020, these fields are reported under the Piedemonte Region.

(3) In our annual report on form 20-F for the year ended December 31, 2019, the Cupiagua and Cusiana fields were included in the Orinoquía Region, whereas for the year ended December 31, 2020, these fields are reported under the Piedemonte Region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

(4) In July 2020, the former Southern and Eastern regions joined to form the Andina region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

Table 8 – Ecopetrol S.A. Production per Type of Crude

	2020 (Mbod)	Year-on-Year Δ (%)	2019 (Mbod)	Year-on-Year Δ (%)	2018 (Mbod)
Light	39.0	6.8%	36.5	(10.3)%	40.7
Medium	140.6	(6.5)%	150.3	(2.7)%	154.4
Heavy	336.4	(6.9)%	361.2	2.1%	353.6
Total	516.0	(5.8)%	548.0	(0.1)%	548.7

Ecopetrol S.A.'s crude oil production in Colombia during 2020 was approximately 35% light and medium crudes and 65% heavy crudes. In 2019, approximately 34% of the crude oil production consisted of light and medium crudes, and 66% consisted of heavy crudes. In 2018, approximately 36% of the crude oil production consisted of light and medium crudes, and 64% consisted of heavy crudes.

Natural Gas Production

In 2020, the average daily production of natural gas by Ecopetrol S.A. (excluding its subsidiaries) reached 121.82 mboed, including natural gas liquids (NGLs), corresponding to a 4.3% increase compared to 2019 production. This production was supplied from the following fields: Cupiagua (35%), Cusiana (24%), Floreña (18%), Guajira (11%), and the remaining 12% from other fields.

By the end of December 31, 2020, the Liquefied Petroleum Gas (LPG) plant of the Cupiagua field produced 7,500 LGP barrels per day. The plant produces LPG and other products such as natural gas liquids (NGL) and penthane (C5).

Starting May 2020, our subsidiary Hocol took in the position of operator of the Chevron's stake in the Chuchupa and Ballena fields, following the approval of the transaction by the Superintendence of Industry and Commerce of Colombia in November 2019.

Table 9 – Ecopetrol S.A.'s Average Daily Natural Gas Production in Colombia

	For the year ended December 31,					
	2020		2019		2018	
	Thousand bpd	mmcfpd	Thousand bpd	mmcfpd	Thousand bpd	mmcfpd
Central Region						
La Cira – Infantas	0.10	0.57	0.12	0.68	0.16	0.91
Provincia	1.48	4.84	1.58	4.96	1.96	7.30
Yarigui	0.42	2.41	0.43	2.45	0.42	2.39
Gibraltar	5.71	29.12	6.25	31.86	6.87	34.94
Other	2.00	10.42	1.68	8.84	1.86	10.20
Total Central Region	9.71	47.36	10.06	48.79	11.27	55.75
Orinoquia Region						
Apiay	0.32	-	0.29	-	0.49	-
Other	0.58	-	0.64	-	0.25	-
Total Orinoquia Region	0.90	-	0.93	-	0.74	-
Piedemonte Region						
Floreña ⁽¹⁾⁽²⁾	22.22	109.93	1.95	8.72	2.06	9.41
Cupiagua ⁽³⁾	42.68	194.99	36.45	196.08	26.97	153.73
Cusiana ⁽³⁾	29.57	136.63	35.72	164.67	34.73	159.83
Total Piedemonte Region	94.47	441.55	74.12	369.47	63.76	322.96
Andina Oriente Region⁽⁴⁾						
Huila Area	0.19	0.34	0.09	0.40	0.13	0.68
Tello	0.08	0.47	0.07	0.40	0.11	0.63
Other	0.19	0.53	0.25	0.23	0.25	0.23
Total Andina Oriente Region	0.46	1.34	0.41	1.03	0.49	1.54
Associated Operations						
Guajira	12.80	72.92	17.92	102.14	23.02	131.21
Floreña ⁽¹⁾⁽²⁾	2.15	9.91	12.50	57.51	12.20	55.46
Other	1.33	5.37	0.82	3.48	1.01	4.50
Total Associated Operations	16.28	88.20	31.24	163.13	36.23	191.18
Total Natural Gas Production (Colombia)	121.82	578.45	116.76	582.43	112.49	571.43

(1) The Piedemonte fields change their name to the Floreña fields as of December 2020.

(2) The Floreña fields were included in Associated Operations until February 2020, when the association contract with Equión ended. Starting in March 2020, these fields are reported under the Piedemonte Region.

(3) In our annual report on form 20-F for the year ended December 31, 2019, the Cupiagua and Cusiana fields were included in the Orinoquia Region, whereas for the year ended December 31, 2020, these fields are reported under the Piedemonte Region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

(4) In July 2020, the former Southern and Eastern regions joined to form the Andina region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

Note: Conversion between mcfpd and boepd is performed at 5,700 mcfpd to 1 boepd. Conversion was done only in respect of natural gas, since natural gas liquids cannot be converted into mcfpd. Therefore, when the Company's natural gas production is measured in boepd, it is higher as that includes natural gas and natural gas liquids. The Company's sales of natural gas liquids represented less than 1% of the Company's consolidated sales for the periods presented in this annual report.

Projects to Increase Recovery Factor

In 2020, Ecopetrol continued the implementation of secondary and tertiary recovery programs to improve the fields' recovery factor. By the end of 2020, the fields with secondary and tertiary recovery programs contributed with 36% of the daily production of the Ecopetrol Group, underpinned by the good results obtained from the water injection expansion projects in the Chichimene, Castilla and Llanito fields.

The recovery programs increased proven reserves by 113 million boe with an investment of approximately US\$ 345 million executed throughout the year. Of 42 recovery projects, 34 correspond to secondary recovery and eight to tertiary recovery.

Development Wells

The following table sets forth the number of gross and net development wells drilled in Colombia, both solely by Ecopetrol S.A. and with its associates, that reached total depth for the years ended December 31, 2020, 2019 and 2018.

Table 10 – Ecopetrol S.A.'s Gross and Net Development Wells in Colombia⁽¹⁾

	For the year ended December 31,					
	2020		2019		2018	
	Productive Wells	Dry Wells	Productive Wells	Dry Wells	Productive Wells	Dry Wells
Central Region						
Gross development wells owned and operated by Ecopetrol	51.0	-	84.0	1.0	12.0	-
Orinoquía Region						
Gross development wells owned and operated by Ecopetrol	32.0	-	87.0	2.0	77.0	-
Andina Oriente Region⁽²⁾						
Gross development wells owned and operated by Ecopetrol	73.0	-	124.0	-	134.0	4.0
Piedemonte Region⁽³⁾						
Gross development wells owned and operated by Ecopetrol	-	-	-	-	-	-
Total gross development wells owned and operated in Colombia	156.0	-	295.0	3.0	223.0	4.0
Associated Operations						
Gross development wells in joint ventures	45.0	-	268.0	5.0	311.0	4.0
Net development wells ⁽⁴⁾	29.0	-	137.0	2.6	148.7	1.8
Total gross development wells in joint ventures Ecopetrol S.A. in Colombia	45	-	268.0	5.0	311.0	4.0
Total net development wells in joint ventures Ecopetrol S.A. in Colombia⁽⁴⁾	29.0	-	137.0	2.6	148.7	1.8
Total gross development wells Ecopetrol S.A. in Colombia	201	-	563.0	8.0	534.0	8.0
Total net development wells Ecopetrol S.A. in Colombia⁽⁴⁾	185.0	-	432.0	5.6	370.7	5.8

(1) Includes only wells that were drilled and completed.

(2) In July 2020, the former Southern and Eastern regions joined and formed the Andina Oriente region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

(3) In our annual report on form 20-F for the year ended December 31, 2019, the Cupiagua and Cusiana wells were included in the Orinoquía Region and the Floreña wells were included in Associated Operations, whereas for the year ended December 31, 2020, these wells are reported under the Piedemonte Region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

(4) Net wells correspond to the sum of wells owned and operated by Ecopetrol plus the net wells in our associated operations. Net wells in the associated operations are the result of our working interest in wells owned in joint ventures with our partners, as defined in the contract obligations.

The following tables set forth activities by geographical area, including the number of gross and net wells in the process of being drilled, completed, or waiting on completion for the year ended December 31, 2020.

Table 11 – Ecopetrol S.A.’s Gross and Net In Process Wells

	For the year ended December 31, 2020			
	Drilled but not completed	Mobilization	Being drilled	Being completed
	(Number of wells)			
COLOMBIA				
Central Region				
Gross in process wells owned and operated by Ecopetrol	7.0	-	4.0	8.0
Orinoquia Region				
Gross in process wells owned and operated by Ecopetrol	-	-	-	-
Andina Oriente Region ⁽¹⁾				
Gross in process wells owned and operated by Ecopetrol	1.0	1.0	2.0	-
Piedemonte Region ⁽²⁾				
Gross in process wells owned and operated by Ecopetrol	-	-	-	-
Total gross in process wells owned and operated in Colombia	8.0	1.0	6.0	8.0
Associated Operations				
Gross in process wells in joint ventures	8.0	-	1.0	-
Net in process wells ⁽³⁾	6.2	-	1.0	-
Total gross in process wells in joint ventures Ecopetrol S.A.	8.0	-	1.0	-
Total net in process wells in joint ventures Ecopetrol S.A. ⁽³⁾	6.2	-	1.0	-
Total gross in process wells Ecopetrol S.A. in Colombia	16.0	1.0	7.0	8.0
Total net in process wells Ecopetrol S.A. in Colombia ⁽³⁾	14.2	1.0	7.0	8.0

(1) In July 2020, the former Southern and Eastern regions joined to form the Andina Oriente region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

(2) In our annual report on form 20-F for the year ended December 31, 2019, the Cupiagua and Cusiana wells were included in the Orinoquia Region and the Floreña wells were included in Associated Operations, whereas for the year ended December 31, 2020, these wells are reported under the Piedemonte Region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

(3) Net wells correspond to the sum of wells owned and operated by Ecopetrol plus the net wells in our associated operations. Net wells in the associated operations are the result of our working interest in wells owned in joint ventures with our partners, as defined in the contract obligations.

Production Acreage

The following table sets forth Ecopetrol S.A.'s developed and undeveloped gross and net acreage of crude oil and natural gas production in Colombia for the year ended December 31, 2020.

Table 12 – Ecopetrol S.A.'s Developed and Undeveloped Gross and Net Acreage of Crude Oil and Natural Gas Production in Colombia

	As of December 31, 2020			
	Developed		Undeveloped	
	Gross	Net	Gross	Net
	(Acres)			
Ecopetrol S.A.	471,969	371,489	4,633,683	3,443,517

Gross and Net Productive Wells

The following table sets forth Ecopetrol S.A.'s total gross and net productive wells by region as of December 31, 2020.

Table 13 – Ecopetrol S.A.'s Gross and Net Productive Wells by Region⁽¹⁾

	For the year ended December 31, 2020			
	Crude Oil ⁽²⁾		Natural Gas ⁽³⁾	
	Gross	Net ⁽⁴⁾	Gross	Net ⁽⁴⁾
	(Number of wells)			
COLOMBIA				
Central Region	2,049	1,548	4.0	4.0
Orinoquía Region	996	985	-	-
Andina Oriente Region ⁽⁵⁾	1,087	1,034	8.0	8.0
Piedemonte Region ⁽⁶⁾	58	58	17.0	17.0
Associated Operations Region	2,711	1,473	34.0	16.0
Total	6,901	5,098	63.0	45.0

(1) Includes only wells that were drilled and completed.

(2) We consider crude oil wells to be those in which the main operation is oil production, although many of these wells produce gas associated with oil production that, in some cases, have a commercial purpose.

(3) Natural gas wells are those in which operations are directed only toward the production of commercial gas.

(4) Net productive wells are calculated by multiplying gross productive wells by our ownership percentage.

(5) In July 2020, the former Southern and Eastern regions joined and formed the Andina Oriente region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

(6) In our annual report on form 20-F for the year ended December 31, 2019, the Cupiagua and Cusiana wells were included in the Orinoquía Region and Floreña wells were included in Associated Operations, whereas for the year ended December 31, 2020, these wells are reported under the Piedemonte Region. Information as of December 31, 2019 and December 31, 2018 was reclassified in this annual report to conform to the presentation as of December 31, 2020.

3.5.2.1.2 Ecopetrol S.A.'s Affiliates and Subsidiaries' Production Activities in Colombia

In 2020, the subsidiaries' production in Colombia came from Hocol and Equiön. During the year, the production obtained from these two companies was 37.6 thousand boepd, which represents 5.4% of the Ecopetrol Group's total production.

Crude Oil Production

The following table sets forth our average daily crude oil production from Hocol and Equiön, prior to deducting royalties, for the periods indicated.

Table 14 – Ecopetrol S.A.'s Subsidiaries in Colombia Average Daily Crude Oil Production⁽¹⁾

	For the year ended December 31,		
	2020	2019	2018
	(Thousand bpd)		
COLOMBIA			
Hocol			
Joint venture operation	1.06	2.00	2.30
Direct operation	19.14	18.80	18.40
Total Hocol	20.20	20.80	20.70
Equion ⁽¹⁾			
Joint venture operation	-	-	-
Direct operation	1.13	7.90	9.00
Total Equion	1.13	7.90	9.00
Production Tests	-	-	-
Total Average Daily Crude Oil Production	21.33	28.70	29.70

(1) Equiön fields were in operation until February 2020.

The 86% decrease in Equiön's production in 2020, as compared to 2019, was mainly due to the termination of the Piedemonte's association contract in February 2020.

Natural Gas Production

The following table sets forth our subsidiaries' average daily natural gas production, prior to deducting royalties, for the periods indicated.

Table 15 – Ecopetrol S.A.'s Subsidiaries in Colombia Average Daily Natural Gas Production

	For the year ended December 31,					
	2020		2019		2018	
	Thousand bpd	mmcfpd	Thousand bpd	mmcfpd	Thousand bpd	mmcfpd
COLOMBIA						
Hocol						
Joint venture operation	2.18	12.43	2.00	11.40	1.60	9.10
Direct operation ⁽¹⁾	13.24	75.48	6.70	38.20	5.90	33.60
Total Hocol	15.42	87.91	8.70	49.60	7.50	42.80
Equiön⁽²⁾						
Joint venture operation	-	-	-	-	0.20	1.10
Direct operation	0.86	4.10	5.00	23.29	4.80	22.34
Total Equiön	0.86	4.10	5.00	23.29	5.00	23.44
Production Tests						
	-	-	-	-	-	-
Total Average Daily Gas Production (Subsidiaries in Colombia)	16.28	92.01	13.70	72.89	12.50	66.24

(1) In November 2019, our subsidiary Hocol acquired Chevron's interest in the Chuchupa and Ballena fields and took the position of operator, this represents the increase in production related to direct operation.

(2) Equiön fields were in operation until February 2020.

Note: Conversion between mcfpd and boepd is performed at 5,700 mcfpd to 1 boepd. Conversion was done only in respect of natural gas, since natural gas liquids cannot be converted into mcfpd. Therefore, when the Company's natural gas production is measured in boepd, it is higher as that includes natural gas and natural gas liquids. The Company's sales of natural gas liquids represented less than 1% of the Company's consolidated sales for the periods presented in this annual report.

The following table sets forth the number of gross and net development wells drilled exclusively by our subsidiaries and in their joint ventures in Colombia for the periods indicated.

Table 16 – Ecopetrol S.A.'s Subsidiaries in Colombia Gross and Net Development Wells⁽¹⁾

	For the year ended December 31,					
	2020		2019		2018	
	Productive Wells	Dry Wells	Productive Wells	Dry Wells	Productive Wells	Dry Wells
(Number of wells)						
Hocol						
Gross development wells owned and operated by Hocol	24.0	-	21.0	2.0	12.0	-
Gross development wells in joint ventures	-	-	2.0	-	2.0	-
Net development wells ⁽²⁾	24.0	-	22.0	2.0	13.0	-
Equion						
Gross development wells owned and operated by Equion ⁽³⁾	-	-	-	-	-	-
Gross development wells in joint ventures	-	-	-	-	-	-
Net development wells ⁽²⁾	-	-	-	-	-	-
Total gross development wells owned and operated in Colombia	24.0	-	21.0	2.0	12.0	-
Total gross development wells in joint ventures in Colombia	-	-	2.0	-	2.0	-
Total net development wells (Subsidiaries in Colombia)⁽²⁾	24.0	-	22.0	2.0	13.0	-

(1) Includes only wells that were drilled and completed.

(2) Net wells correspond to the sum of wells owned and operated by Ecopetrol plus the net wells in our associated operations. Net wells in the associated operations are the result of our working interest in wells owned in joint ventures with our partners, as defined in the contract obligations.

(3) Equion fields were in operation until February 2020.

Note: There were no dry wells in our Colombian subsidiaries' operations for the year ended December 31, 2018 and December 31, 2020.

Table 17 – Ecopetrol S.A.'s Subsidiaries in Colombia Gross and Net In Process Wells⁽¹⁾

	For the year ended December 31, 2020			
	Drilled but not completed	Mobilization	Being drilled	Being completed
	(Number of wells)			
Hocol				
Gross in process wells owned and operated by Hocol	-	1.0	-	1.0
Gross in process wells in joint ventures	-	-	-	-
Net in process wells ⁽¹⁾	-	1.0	-	1.0
Equión⁽²⁾				
Gross in process wells owned and operated by Equión	-	-	-	-
Gross in process wells in joint ventures	-	-	-	-
Net in process wells ⁽¹⁾	-	-	-	-
Total gross in process wells owned and operated in Colombia	-	1.0	-	1.0
Total gross in process wells in joint ventures in Colombia	-	-	-	-
Total net in process wells (Subsidiaries in Colombia)	-	1.0	-	1.0

(1) Net wells correspond to the sum of wells owned and operated by Ecopetrol plus the net wells in our associated operations. Net wells in the associated operations are the result of our working interest in wells owned in joint ventures with our partners, as defined in the contract obligations.

(2) Equion fields were in operation until February 2020.

Production Acreage

The following table sets forth our subsidiaries' developed and undeveloped gross and net acreage of crude oil and natural gas production in Colombia for the year ended December 31, 2020.

Table 18 – Ecopetrol S.A.'s Subsidiaries in Colombia Developed and Undeveloped Gross and Net Acreage of Crude Oil and Natural Gas Production

	As of December 31, 2020			
	Developed		Undeveloped	
	Gross	Net	Gross	Net
	(Acres)			
Hocol ⁽¹⁾	62,774	37,608	3,005	2,967
Equión ⁽²⁾	-	-	-	-
Total	62,774	37,608	3,005	2,967

(1) In November 2019, our subsidiary Hocol acquired Chevron's interest in the Chuchupa and Ballena fields and took the position of operator since May 2020, this represents the increase in acreage related to Undeveloped Gross and Net Acreage of Crude Oil and Natural Gas Production.

(2) Equion fields were in operation until February 2020.

The following table sets for the expiration dates of material concentrations of the Company's consolidated undeveloped acreage by geographic area as of December 31, 2020.

Table 19 – Undeveloped Production Acreage as of December 31, 2020 by Expiration Year

	For the year ended December 31,									
	2021		2022		2023		2024		2025 and beyond	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
(Acres)										
COLOMBIA										
Ecopetrol S.A.	-	-	-	-	-	-	-	-	551,999	321,721
Hocol	-	-	-	-	-	-	-	-	-	-
Equión ⁽¹⁾	-	-	-	-	-	-	-	-	-	-
Total Colombia	-	-	-	-	-	-	-	-	551,999	321,721
PERÚ										
Savia Perú ⁽²⁾	-	-	-	-	57,671	28,836	-	-	-	-
Total Perú	-	-	-	-	57,671	28,836	-	-	-	-
UNITED STATES OF AMERICA										
Ecopetrol America LLC	-	-	-	-	-	-	-	-	-	-
Ecopetrol Permian LLC	-	-	-	-	-	-	-	-	-	-
Total United States of America	-	-	-	-	-	-	-	-	-	-

(1) Equion fields were in operation until February 2020.

(2) Savia's fields will end operation in November 2023 when the contract expires.

Gross and Net Productive Wells

The following table sets forth our subsidiaries' total gross and net productive wells in Colombia for the year ended December 31, 2020.

Table 20 – Ecopetrol S.A.'s Subsidiaries in Colombia Gross and Net Productive Wells⁽¹⁾⁽²⁾

	For the year ended December 31, 2020			
	Crude Oil		Natural Gas	
	Gross	Net ⁽³⁾	Gross	Net ⁽³⁾
(Number of wells)				
Hocol ⁽⁴⁾	279.0	240.0	52.0	34.0
Equión ⁽⁵⁾	-	-	-	-
Total (Subsidiaries in Colombia)	279.0	240.0	52.0	34.0

(1) Information in the table above reflects productive wells that directly contribute to hydrocarbons production and therefore excludes wells used for injection, disposal, water abstraction or other similar activities. We consider crude oil wells to be those in which the main operation is oil production, although many of these wells produce gas associated with oil production that, in some cases, have a commercial purpose. Natural gas wells are those in which operations are directed only towards production of commercial gas.

(2) Includes only wells that were drilled and completed.

(3) Net wells correspond to the sum of wells entirely owned by us or our subsidiaries and our ownership percentage of wells owned in joint ventures with our partners.

(4) In November 2019, our subsidiary Hocol acquired Chevron's interest in the Chuchupa and Ballena fields and took the position of operator since May 2020, this represents the increase in the increase in Gross and Net Productive Natural Gas Wells.

(5) Equion fields were in operation until February 2020.

3.5.2.2 Production Activities Outside Colombia

In 2020, the subsidiaries' production outside Colombia came from Ecopetrol America LLC, Ecopetrol Permian LLC and Savia. In 2020, the production obtained from these three companies was 21.4 thousand boepd, which represents 3.1% of the Ecopetrol Group's total production.

Crude Oil Production

The following table sets forth our average daily crude oil production outside Colombia, prior to deducting royalties, for the periods indicated.

Table 21 – Ecopetrol S.A.'s Subsidiaries Outside Colombia Average Daily Crude Oil Production⁽¹⁾

	For the year ended December 31,		
	2020	2019	2018
	(Thousand bpd)		
PERÚ			
Savia Perú ⁽¹⁾	3.11	3.50	3.90
UNITED STATES OF AMERICA			
Ecopetrol America LLC	10.41	11.40	10.20
Ecopetrol Permian LLC	3.85	0.10	-
Total average daily crude oil production (International)	17.37	15.00	14.10

(1) In January 2021 Ecopetrol S.A. divested its 50% equity share in Savia Peru as the result of a competitive bidding process led jointly with its partner KNOC.

Natural Gas Production

The following table sets forth our average daily natural gas production outside Colombia, prior to deducting royalties, for the periods indicated.

Table 22 – Ecopetrol S.A.'s Subsidiaries Outside Colombia Average Daily Natural Gas Production

	For the year ended December 31,					
	2020		2019		2018	
	Thousand bpd	mmcfpd	Thousand bpd	mmcfpd	Thousand bpd	mmcfpd
PERÚ						
Savia Perú ⁽¹⁾	0.91	2.44	0.90	3.99	1.10	2.90
UNITED STATES OF AMERICA						
Ecopetrol America LLC	1.78	10.15	1.80	10.26	1.80	10.30
Ecopetrol Permian LLC	1.46	3.26	-	-	-	-
Total average daily natural gas production (International)	4.15	15.85	2.70	14.30	2.90	13.10

(1) In January 2021 Ecopetrol S.A. divested its 50% equity share in Savia Peru as the result of a competitive bidding process led jointly with its partner KNOC.

Note: Conversion between mcfpd and boepd is performed at 5,700 mcfpd to 1 boepd. Conversion was done only in respect of natural gas, since natural gas liquids cannot be converted into mcfpd. Therefore, when the Company's natural gas production is measured in boepd, it is higher as that includes natural gas and natural gas liquids. The Company's sales of natural gas liquids represented less than 1% of the Company's consolidated sales for the periods presented in this annual report.

Development Wells

The following table sets forth the number of gross and net development wells outside Colombia, drilled exclusively by us and in joint ventures for the periods indicated.

Table 23 – Ecopetrol S.A.'s Subsidiaries Outside Colombia Gross and Net Development Wells⁽¹⁾

Number of wells	For the year ended December 31,					
	2020		2019		2018	
	Productive Wells	Dry Wells	Productive Wells	Dry Wells	Productive Wells	Dry Wells
PERÚ						
Savia Peru⁽²⁾						
Gross development wells	-	-	-	-	-	-
Net development wells ⁽³⁾	-	-	-	-	-	-
UNITED STATES OF AMERICA						
Ecopetrol America LLC						
Gross development wells	-	-	2.0	-	1.0	-
Net development wells ⁽³⁾	-	-	0.5	-	0.3	-
Ecopetrol Permian LLC⁽⁴⁾						
Gross development wells	18.0	-	6.0	-	-	-
Net development wells ⁽³⁾	8.8	-	2.0	-	-	-
Total gross wells (International)	18.0	-	8.0	-	1.0	-
Total net wells (International)⁽³⁾	8.8	-	2.5	-	0.3	-

(1) Includes only wells that were drilled and completed.

(2) In January 2021 Ecopetrol divested its 50% equity share in Savia Peru as the result of a competitive bidding process led jointly with its partner KNOC.

(3) Net wells correspond to the sum of wells entirely owned by us or our subsidiaries and our ownership percentage of wells owned in joint ventures with our partners.

(4) Includes only wells drilled and completed under direct operation by Occidental Petroleum Corp (OXY). Non-operated wells are not included because they are not considered material. Wells operated by others are not included because Ecopetrol's share is not material.

Table 24 – Ecopetrol S.A.'s Subsidiaries Outside Colombia Gross and Net In Process Wells

	For the year ended December 31, 2020			
	Drilled but not completed	Mobilization	Being drilled	Being completed
	(Number of wells)			
PERÚ				
Savia Perú⁽¹⁾				
Gross in process wells	-	-	-	-
Net in process wells ⁽²⁾	-	-	-	-
UNITED STATES OF AMERICA				
Ecopetrol America LLC				
Gross in process wells	-	-	-	-
Net in process wells ⁽²⁾	-	-	-	-
Ecopetrol Permian LLC⁽³⁾				
Gross in process wells	18.0	2.0	2.0	3.0
Net in process wells ⁽²⁾	8.8	1.0	1.0	1.5
Total gross in process wells (International)	18.0	2.0	2.0	3.0
Total net in process wells (International)⁽²⁾	8.8	1.0	1.0	1.5

(1) In January 2021 Ecopetrol divested its 50% equity share in Savia Peru as the result of a competitive bidding process led jointly with its partner KNOC.

(2) Net wells correspond to the sum of wells owned and operated by Ecopetrol plus the net wells in our associated operations. Net wells in the associated operations are the result of our working interest in wells owned in joint ventures with our partners, as defined in the contract obligations.

(3) Includes only wells under direct operation by OXY. Non -operated wells are not included because they are not material.

Production Acreage

The following table sets forth our developed and undeveloped gross and net acreage of crude oil and natural gas production outside Colombia for the year ended December 31, 2020.

Table 25 – Ecopetrol S.A.’s Subsidiaries Outside Colombia Developed and Undeveloped Gross and Net Acreage of Crude Oil and Natural Gas Production

	For the year ended December 31, 2020			
	Developed		Undeveloped	
	Gross	Net	Gross	Net
	(Acres)			
PERÚ				
Savia Perú ⁽¹⁾	79,575	39,787	57,671	28,836
UNITED STATES OF AMERICA				
Ecopetrol America LLC	55,440	14,479	23,040	6,566
Ecopetrol Permian LLC	65,358	47,825	1,498	258
Total (International)	200,373	102,091	82,209	35,660

(1) In January 2021 Ecopetrol divested its 50% equity share in Savia Peru as the result of a competitive bidding process led jointly with its partner KNOC.

Gross and Net Productive Wells

The following table sets forth our total gross and net productive wells outside Colombia for the year ended December 31, 2020.

Table 26 – Ecopetrol S.A.’s Subsidiaries Outside Colombia Gross and Net Productive Wells⁽¹⁾⁽²⁾

	For the year ended December 31, 2020	
	Crude Oil	
	Gross	Net ⁽³⁾
	(Number of wells)	
PERÚ		
Savia Perú ⁽⁴⁾	599.0	299.5
UNITED STATES OF AMERICA		
Ecopetrol America LLC	16.0	3.9
Ecopetrol Permian LLC ⁽⁵⁾	22.0	10.8
Total (International)	637.0	314.2

(1) Includes only wells that were drilled and completed.

(2) Information in the table above reflects productive wells that directly contribute to hydrocarbons production and therefore excludes wells used for injection, disposal, water abstraction or other similar activities. We consider crude oil wells to be those in which the main operation is oil production, although many of these wells produce gas associated with oil production that, in some cases, have a commercial purpose. Natural gas wells are those in which operations are directed only towards production of commercial gas.

(3) Net wells correspond to the sum of wells entirely owned by us or our subsidiaries and our ownership percentage of wells owned in joint ventures with our partners.

(4) In January 2021 Ecopetrol S.A. divested its 50% equity share in Savia Peru as the result of a competitive bidding process led jointly with its partner KNOC.

(5) Includes only wells drilled and completed under direct operation by Occidental Petroleum Corp (OXY). Non-operated wells are not included because they are not material.

3.5.2.3 Marketing of Crude Oil and Natural Gas

In 2020, Ecopetrol sold 883 mboed, out of which 425 mboed represented sales of crude oil (48%), 87 mboed of natural gas (10%) and 371 mboed of fuels and petrochemicals (42%).

Crude Oil Export Sales

In 2020, crude oil export sales increased by 13 mboed compared to 2019, mainly due to the greater availability of crude oil, supported by our sales and marketing strategy in response to lower crude oil runs at the refineries, which in turn was primarily due to a decrease in the domestic demand for fuels and refined products. Ecopetrol's crude oil export sales are traded both in the spot and contract markets, primarily to refiners in the United States and Asia.

The Castilla blend is the main type of crude oil for export sales, with 371 mboed sold during 2020 (a 89% share of the crude oil basket) followed by Vasconia with 24 mboed (a 6% share of the crude oil basket), the domestic crudes sold by Ecopetrol America LLC with 8 mboed, (a 2% share of the crude oil basket), and Mares blend with 7 mboed (a 2% share of the crude oil basket).

Ecopetrol places its exports in markets that provide the best value for its crudes. In 2020, Asia was the main destination, representing 49% of crude oil exports, closely followed by the United States with 43%. The expansion of refining capacity in countries like China as well as the fast recovery in crude demand of key refining hubs in Asia after lockdown measures to curb the spread of the COVID-19 pandemic were eased in Asia have supported the increase of crude oil flows from Colombia to Asia.

Moreover, volatility in the production of regional competitors has given refiners in the United States, India and other markets an incentive to diversify their supply sources, which in turn has opened opportunities for Colombian producers. Our crude basket realization price decreased by US\$ 24/Bl year over year due to market conditions stemming from the effects of the COVID-19 pandemic mentioned above.

Crude Oil Purchase Contracts

Ecopetrol has signed several crude oil purchase contracts with third parties and business partners. Ecopetrol also purchases the country's crude oil royalties from the National Hydrocarbons Agency. These crudes are processed in Ecopetrol's refineries or exported. The purchase price is referenced to export parity based on international market prices, plus a commercial fee. See section [Business Overview—Related Party and Intercompany Transactions](#).

The table below sets forth the volumes of crude oil purchased from our business partners and third parties and volumes of crude oil purchased from the ANH from royalties for the years ended on December 31, 2020, 2019 and 2018.

Table 27 – Ecopetrol Consolidated Crude Oil Purchases

	For the year ended December 31,		
	2020	2019	2018
	(Million barrels)		
Crude oil purchased from ANH royalties	31.0	35.4	37.6
Crude oil purchased from third parties	34.0	30.0	20.7
Crude oil imported from third parties	5.6	9.1	14.0

During 2020, part of Ecopetrol's crude strategy was centered on increasing the purchase and subsequent commercialization of crude oil from third parties, which enables further optimization of the supply chain and margin capture.

Import of Diluents

In 2020, Ecopetrol decreased the imports of diluent by 32% (17 mbod) compared to 2019, due to the use of domestic produced naphtha. Diluent is used to transport heavy crudes through the pipeline system.

Natural Gas Sales

Ecopetrol sells natural gas to distribution companies through firm, interruptible and conditional contracts. These distributors supply natural gas to the residential market, as compressed natural gas for vehicles market and to large industrials in Colombia. We also market and sell natural gas directly to the industrial sector and to gas-fired power plants.

Ecopetrol's natural gas sales and self-consumption increased by 2% (2.9 mboed) compared to 2019, due to higher production primarily as a result of Hocol's acquisition of Chevron's interest in the Guajira association contract.

Natural Gas Delivery Commitments

The table below sets forth the commitments we have in Colombia under firm contracts with local natural gas distribution companies, local industries, gas-fired power generators and internal agreements with our refineries and fields.

Table 28 – Ecopetrol Consolidated Natural Gas Delivery Commitments

	For the year ended December 31,			
	2021	2022	2023	2024
	(gbtud)			
Volume for sales third parties	503.3	483.3	420.9	311.1
Volume for self-consumption	188.2	169.4	160.9	157.1
Volume for intercompany sales	89.4	18.5	18.5	16.8
Total Commitments	780.9	671.2	600.3	485.0

The table above is based on current contracts of Ecopetrol S.A. and the official report made to the Ministry of Mines and Energy in 2020. Self-consumption volumes decreased over time as a result of more efficient operations in our refineries. Third party volumes do not include potential production coming from exploratory projects. According to current regulations, these volumes will be committed and commercialized after declaring exploratory success.

3.5.3 Reserves

The reserves reporting process was conducted in accordance with SEC definitions and rules set forth in Rule 4-10(a) of Regulation S-X and the disclosure guidelines contained in the SEC's Modernization of Oil and Gas Reporting final rule dated December 31, 2008 and effective as of January 1, 2010.

The estimated reserve amounts presented in this annual report, as of December 31, 2020, are based on the average prices during the 12-month period prior to the ending date of the period covered in this annual report, determined as the unweighted arithmetic averages of the prices in effect on the first day of the month for each month within such period, unless prices were defined by contractual arrangements, as required by the SEC regulations.

Our crude oil and natural gas net proved reserves include reserves from our subsidiaries located in the United States and Peru, and from Hocol's assets in Colombia.

Estimated Net Proved Reserves

The following table sets forth our estimated net proved developed reserves of crude oil and gas by region for the years ended December 31, 2020, 2019 and 2018.

Table 29 – Net Proved Developed Reserves

	Colombia	North America	South America excluding Colombia	Total
Net Proved Developed oil reserves in million barrels oil equivalent				
At December 31, 2020 ⁽¹⁾	757.4	16.3	2.3	776.0
At December 31, 2019	832.0	12.0	3.8	848.0
At December 31, 2018	814.0	13.0	5.0	832.0
Net Proved Developed NGL reserves in million barrels oil equivalent				
At December 31, 2020	57.0	1.1	0.4	58.0
At December 31, 2019	49.0	0.1	0.5	50.0
At December 31, 2018	50.5	-	0.6	51.1
Net Proved Developed gas reserves in billion standard cubic feet				
At December 31, 2020 ⁽²⁾	2,617.0	15.0	4.4	2,636.4
At December 31, 2019	2,645.0	11.0	7.0	2,662.0
At December 31, 2018	2,865.5	10.0	7.0	2,882.5
Net Proved Developed oil, NGL and gas reserves in million barrels oil equivalent				
At December 31, 2020	1,273.3	20.0	3.5	1,296.8
At December 31, 2019	1,345.0	14.0	6.0	1,365.0
At December 31, 2018	1,368.0	14.0	7.0	1,389.0

(1) Oil Reserves included 14 million barrels of Fuel Oil.

(2) Gas Reserves included 411 bcf of Fuel Gas.

Totals may not exactly equal the sum of the individual entries due to rounding. The conversion rate used is 5,700 standard cubic feet = 1 barrel of oil equivalent.

We are required, as are all oil companies undertaking exploratory and production activities in Colombia, to pay a percentage of our production to the Government as royalties. However, the ANH's Resolution 877 of 2013, Resolution 351 of 2014 and Resolution 640 of 2014 require natural gas royalties to be paid in cash, which means that the determination of the property rights to the quantities of natural gas we produce is based on the total volume produced without deductions on account of royalties. The main producing gas fields are Cupiagua, Pauto, Cusiana, Chuchupa and Gibraltar.

Ecopetrol S.A. owns 100% of Cenit, a subsidiary that operates in Colombia and is dedicated to the storage and transportation of hydrocarbons through pipelines. Cenit provides transportation services for the entire Ecopetrol Group and we fully consolidate Cenit into our consolidated results of operations. Therefore, the difference between the tariffs set by the Ministry of Mines and Energy and the real transportation costs (fixed and variable operating expenses) does not affect our consolidated income statement. Thus, in presenting our reserves information in the 2018, 2019 and 2020 annual reports, we have used our real transportation costs, rather than the regular tariffs set by the Ministry of Mines and Energy.

The following table summarizes our proved oil, NGL and natural gas reserves, which includes 14 million barrels of fuel oil, 411 billion standard cubic feet of fuel gas within our natural gas results and 429 billion cubic feet of royalties, as of December 31, 2020.

Table 30 – Proved Oil, NGL and Natural Gas Reserves for 2020

	Oil (mmb)	NGL (mmb)	Natural Gas (bcf)	Total Oil and Gas (mmboe)
PROVED DEVELOPED RESERVES				
Colombia	757.4	56.8	2,617.0	1,273.3
International				
North America	16.3	1.1	15.0	20.0
South America ⁽¹⁾	2.3	0.4	4.4	3.5
TOTAL PROVED DEVELOPED RESERVES	776.0	58.2	2,636.4	1,296.8
PROVED UNDEVELOPED RESERVES				
Colombia	290.5	6.1	179.9	328.2
International				
North America	105.8	21.0	105.1	145.2
South America ⁽¹⁾	-	-	-	-
TOTAL PROVED UNDEVELOPED RESERVES	396.4	27.1	285.0	473.4
TOTAL PROVED RESERVES	1,172.4	85.3	2,921.5	1,770.2

(1) The reserves in South America include participation in Savia Peru, where we sold our interest on January 19, 2021.

Note: Totals may not exactly equal the sum of the individual entries due to rounding. The conversion rate used is 5,700 standard cubic feet = 1 barrel of oil equivalent.

The following table summarizes our proved oil, NGL and natural gas reserves, which includes 17 million barrels of fuel oil, 381 billion standard cubic feet of fuel gas within our natural gas results and 517 billion cubic feet of royalties, as of December 31, 2019.

Table 31 – Proved Oil, NGL and Natural Gas Reserves for 2019

	Oil (mmb)	NGL (mmb)	Natural Gas (bcf)	Total Oil and Gas (mmboe)
PROVED DEVELOPED RESERVES				
Colombia	832.0	49.0	2,645.0	1,345.0
International				
North America	12.0	0.1	11.0	14.0
South America	3.8	0.5	7.0	6.0
TOTAL PROVED DEVELOPED RESERVES	847.8	50.0	2,662.0	1,365.0
PROVED UNDEVELOPED RESERVES				
Colombia	306.0	28.0	111.0	353.0
International				
North America	123.0	29.0	133.0	175.0
South America	-	-	-	-
TOTAL PROVED UNDEVELOPED RESERVES	429.0	57.0	244.0	529.0
TOTAL PROVED RESERVES	1,277.0	107.0	2,906.0	1,893.0

Note: Totals may not exactly equal the sum of the individual entries due to rounding. The conversion rate used is 5,700 standard cubic feet = 1 barrel of oil equivalent.

The following table summarizes our proved oil, NGL and natural gas reserves, which includes 16 million barrels of fuel oil, 327 billion standard cubic feet of fuel gas within our natural gas results and 534 billion cubic feet of royalties, as of December 31, 2018.

Table 32 – Proved Oil, NGL and Natural Gas Reserves for 2018

	Oil (mmb)	NGL (mmb)	Natural Gas (bcf)	Total Oil and Gas (mmboe)
PROVED DEVELOPED RESERVES				
Colombia	814.0	50.5	2,866.0	1,368.0
International				
North America	13.0	-	10.0	14.0
South America	5.0	0.5	7.0	7.0
TOTAL PROVED DEVELOPED RESERVES	832.0	51.0	2,883.0	1,389.0
PROVED UNDEVELOPED RESERVES				
Colombia	285.0	22.0	113.0	327.0
International				
North America	10.0	-	6.0	11.0
South America	-	-	-	-
TOTAL PROVED UNDEVELOPED RESERVES	295.0	22.0	119.0	338.0
TOTAL PROVED RESERVES	1,127.0	73.0	3,002.0	1,727.0

Note: The conversion rate used is 5,700 standard cubic feet = 1 barrel of oil equivalent.

Changes in Proved Reserves

Table 33 – Changes in Proved Reserves

	For the year ended December 31,		
	2020	2019	2018
	(Mmboe)		
Revisions of previous estimates	(71.5)	83.0	120.5
Improved Recovery	113.1	94.0	129.1
Extensions and discoveries	42.7	67.0	57.4
Purchases	29.9	164.0	-
Sales	(1.0)	-	-
Total reserves additions	113.2	408.0	307.0
Production	(236.3)	(242.0)	(239.0)
Net change in proved reserves	(123.0)	166.0	68.0

Reserves Replacement

The reserves replacement ratio is defined as the sum of additions and revisions of proved reserves divided by produced volumes in any given period. The following table presents the changes in reserves in each category relating to the reserve replacement ratio for the years 2020, 2019 and 2018.

The reserves replacement ratio for 2020 was 48% compared to 169% in 2019 and 129% in 2018.

The average replacement ratio for the last three years was 115%.

Table 34 – Reserves Replacement Ratio (Including Purchases and Sales)

	For the year ended December 31,		
	2020	2019	2018
Annual	48%	169%	129%
Three-year average	115%	140%	83%

Revisions of Previous Estimates

In 2020, revisions decreased reserves by 71 million boe, mainly as a result of:

- (i) A 215 million boe decrease attributed to economic factors and reevaluated projects. More specifically, we were negatively impacted by the substantial decrease in oil prices, with the ICE Brent crude price being 32% lower in 2020 as compared to 2019, which resulted in the lowering of economic limits in some of our fields and some projects becoming uneconomical under SEC standards.
- (ii) An offsetting positive 114 million boe increase in reserves related to new projects in the Caño Sur, Quifa, Cusiana, Pauto and Rubiales fields as well as new areas included in the approved five-year development plan for our North American fields.
- (iii) An offsetting positive 30 million boe increase related to field performance studies and development activities in existing fields.

In 2019, revisions increased reserves by 83 million boe, mainly as a result of:

- (i) An increase of 33 million boe due to improved reservoir performance in the Rubiales field and continuous development with drilling activities.
- (ii) An increase of 36 million boe in reserves due to the review of the curve type of new development activities according to updated new wells results in the Caño Sur field and additional gas processing plant capacity to extract NGL in the Cupiagua field.
- (iii) An increase of 14 million boe in reserves, due to better production performance mainly in the Akacias, Caño Limón and Chichimene fields.

Nonetheless, due to the decrease in oil price compared to the Brent reference price used in the reserve estimation process at \$63 per barrel in 2019 (as compared to \$72 per barrel in 2018), the Company removed volumes of total proved reserves in the amount of 19 million boe, which have become uneconomical. This impact was partially offset by improved reservoir performance and new projects in several fields.

In 2018, revisions increased reserves by 121 million boe, mainly as a result of:

- (i) An increase of 87 million boe due to the continuous development of the Rubiales, Chichimene and Quifa fields, of which a 68 million boe increase in reserves is due to improved reservoir performance in the Rubiales field.

- (ii) An increase 14 million boe increase in reserves due to development activities in the Bonanza and Ocelote fields.
- (iii) An increase of 19.8 million boe, due to other development activities and good well performance in other fields.

Improved Recovery

In 2020, improved recovery activities increased reserves by 113 million boe. This increase was associated with new proved areas under water flooding in the Chichimene and Castilla fields, and optimization of the gas injection and blowdown strategy of the Cupiagua field.

In 2019, improved recovery increased reserves by 94 million boe. An increase of 25 million boe was associated with new proved areas under water flooding in the Chichimene and Akacias fields. Furthermore, the continued development of water flooding projects at existing wells in the Castilla, Chichimene, Yarigui, La Cira-Infantas fields accounted for a 45 million boe increase. The remaining 26%, or 24 million boe, increase was due primarily to water injection reservoir responses at various fields.

In 2018, improved recovery increased reserves by 129 million boe. The additions were associated with new proved areas under water flooding in the Chichimene, Castilla, La Cira-Infantas, Apiay, Suria, Yarigui, Casabe and Dina Cretaceo fields (86 million boe increase). In addition, the new steam injection project at the Teca-Cocomá field accounted for a 19 million boe increase in reserves. The remaining 19%, or 24 million boe, increase was due primarily to water injection reservoir responses at various fields.

On average, improved recovery has added 112 million boe each year over the last three years.

Extensions and Discoveries

The following table sets forth the change in the Company's proved reserves attributed to extensions and discoveries in millions of boe for the periods indicated.

Table 35 – Changes in Proved Reserves Attributed to Extensions and Discoveries

	For the year ended December 31,		
	2020	2019	2018
	(Mmboe)		
Extensions and discoveries			
Total change	42.7	67.0	57.4
Proved Undeveloped Reserves Change	14.6	34.0	39.9
Change from unproved to proved developed reserves	28.0	33.0	17.5

The difference between the change of developed proved reserves and undeveloped proved reserves is related to the drilling of new wells in unproved acreage that led to new proved producing reserves.

The Company's extensions and discoveries during 2020 amounted to 43 million boe primarily due to extensions of proved acreage, which in turn were mainly from activities in new proved areas in the Rubiales, Suria, Yarigui and Llanito fields (accounting for 38.5 million boe of the total change) and newly discovered fields Andina and Esox (accounting for 4 million boe of the total change). The Company's extensions and discoveries during 2019 amounted to 67 million boe primarily due to extensions of proved acreage, which in turn were mainly from activities in new proved areas in the Rubiales, Quifa, Suria, Tisquirama, Cupiagua Sur, Castilla and Garzas fields (accounting for 55 million boe). The remaining 12 million boe corresponded to smaller changes in 26 fields with variations between 0.01 to 2.1 million boe.

The Company's extensions and discoveries during 2018 amounted to 57 million boe primarily due to extensions of proved acreage, which in turn were mainly from activities in new proved areas in the Rubiales, Castilla, Cupiagua, Pauto and Caño Sur fields (accounting for 45 million boe) and newly discovered fields and reservoirs (accounting for 12 million boe). The remaining 9 million boe corresponded to smaller changes in several other fields.

Purchases

Starting May 2020, Hocol S.A. took on the position of operator of the Guajira Contract, after the approval of the transaction in which Ecopetrol S.A. through its wholly owned subsidiary, Hocol S.A., acquired 100% of Chevron Petroleum Company's participation in the contract (comprising the Ballena and Chuchupa fields in Colombia which corresponds to 43% of the total contract). This purchase increased proved reserves by 29.9 million boe.

In 2019, Ecopetrol S.A. through its wholly owned subsidiary, Ecopetrol Permian LLC acquired 49% of Rodeo Midland Basin LLC, a company whose economic activity is directed towards the execution of a joint development plan under the joint venture between Ecopetrol and Occidental Petroleum Corp, announced on July 31, 2019, which represented 164 million boe. Through this joint venture, the Company and Occidental Petroleum Corp are pursuing development of unconventional reservoirs in approximately 97,000 acres of the Permian Basin in Texas. For the acquisition and closing of the transaction, Ecopetrol S.A. made an initial payment of approximately US \$876.5 million dollars. As of December 31, 2020, Ecopetrol had paid a total of US\$ 121.8 million of the initial US\$ 750 million carry obligation.

There were no purchases or acquisitions in 2018.

Sales

Pursuant to a public auction process carried out by Ecopetrol and Hocol in December 2020, an offer was received from Cordillera Resources SAS, Nikoil Energy Corp and Petroleum Blending International for 100% of our working interest in the La Punta and Santo-Domingo fields, which was declared the winning offer. We are now pending approval of such sale from the ANH, a process that typically takes 18 months. Based on that timing, we do not expect the formal approval to be received until July 2022.

Development of reserves

As of December 31, 2020, our total proved undeveloped oil and gas reserves amounted to 473 million boe, 69% of which is related to development activities at the Rubiales, Castilla and Chichimene fields in Colombia, among others, and 31% of which is related to development activities in North American fields.

Ecopetrol's year-end development plans are consistent with SEC guidelines for the development of proved undeveloped reserves within five years. The development plan of Rubiales Field goes beyond the five years due to the water disposal restrictions in the facilities. The drilling of two wells in the United States Gulf of Mexico and one well onshore in Colombia also goes beyond five years due to drilling schedule. These wells are part of the ongoing development projects and all remaining development investments for the latter three wells will be completed within six years from their initial disclosure. These exemptions were reviewed and approved by the external certification agent.

As of December 31, 2019, our total proved undeveloped oil and gas reserves amounted to 529 million boe, 46% of which is related to development activities in the Rubiales, Castilla, Caño Sur Chichimene, Teca, Akacias and Pauto fields and 31% of which is related to development of unconventional reservoirs of the U.S. Permian Basin in Texas. The remaining 23% comes from activities at several other fields.

In 2019, Ecopetrol's year-end development plans were consistent with SEC guidelines for the development of proved undeveloped reserves within five years. The development plan of Rubiales Field went beyond the five years due to the limitations in water handling in the facilities. These exemptions were reviewed and approved by the external certification agent.

As of December 31, 2018, our total proved undeveloped oil and gas reserves amounted to 338 million boe, 21% of which is related to new drilling activities in the Rubiales field, 41% is related to development activities in the Castilla, Caño Sur, Chichimene, Quifa, Cupiagua and Yarigui fields and 22% of which is related to the new development activities in the Teca, Pauto, Bonanza and Ryberg fields. The remaining 16% comes from activities at several other fields.

In 2018, the development plan of Rubiales and Caño Sur Field went beyond 5 years due to the limitations in water handling in the facilities and Ryberg offshore field. These exemptions were reviewed by the external certification agent.

Our proved undeveloped reserves represent 27% of our total proved reserves as of December 31, 2020, 28% as of December 31, 2019, and 20% as of December 31, 2018.

The following table reflects the developed and undeveloped proved reserves estimates through the past three fiscal years.

Table 36 – Developed and Undeveloped Proved Reserves

	Oil (mmb)	NGL (mmb)	Natural Gas (bcf)	Total Oil and Gas (mmboe)
2020 Proved Reserves				
Developed	776	58	2,636	1,297
Undeveloped	396	27	285	473
2019 Proved Reserves				
Developed	848	50	2,662	1,365
Undeveloped	429	57	244	529
2018 Proved Reserves				
Developed	832	51	2,882	1,389
Undeveloped	295	23	119	338

Of the total amount of proved undeveloped reserves that Ecopetrol had at the end of 2019 (529 million boe), we converted approximately 69 million boe, or 13%, to proven developed reserves during 2020. Approximately 86% of the total conversion is mainly associated with the development of crude oil and gas projects in the Castilla, Rubiales, and Cupiagua fields, among others, and 14% is associated with development execution in fields, such as the Ocelote field, among others. The amount of investments made during 2020 to convert proved undeveloped reserves to proved developed reserves was US\$353 million.

Of the total amount of proved undeveloped reserves that Ecopetrol had at the end of 2018 (338 million boe), we converted approximately 89 million boe, or 26%, to proven developed reserves during 2019. Approximately 75% of the total conversion is primarily associated with the development of crude oil and gas projects in the Castilla, Rubiales, Chichimene and Yarigui fields (67 million boe), while the remaining 25% is associated with development execution in other fields such as the Suria, Casabe, Quifa, Caño Sur and Ocelote fields, among others. The amount of investments made during 2019 to convert proved undeveloped reserves to proved developed reserves was US\$791 million.

Of the total amount of proved undeveloped reserves that Ecopetrol had at the end of 2017 (287 million boe), we converted approximately 84 million boe, or 29%, to proven developed reserves during 2018. Approximately 69% of the total conversion is primarily associated with the development of crude oil and gas projects in the Castilla, Rubiales and Chichimene fields (58 million boe), while the remaining 31% is associated with development execution in other fields such as the Ocelote, La Cira-Infantas, Caño Sur and K2 fields, among others. The amount of investments made during 2018 to convert proved undeveloped reserves to proved developed reserves was US\$841 million.

Changes in Undeveloped Proved Reserves

The following table reflects the main changes in undeveloped proved reserves as of December 31, 2020, 2019 and 2018.

Table 37 – Changes in Undeveloped Proved Reserves

	For the year ended December 31,		
	2020	2019	2018
	(Mmboe)		
Consolidated companies			
Revisions of previous estimates	(46.3)	43.0	28.4
Improved Recovery	45.9	40.0	67.1
Extensions and discoveries	14.6	34.0	39.9
Purchases	-	163.0	-
Proved undeveloped converted to proved developed	(69.4)	(89.0)	(83.7)
Net change in unproved reserves	(55.2)	190.0	51.7

Note: The conversion rate used is 5,700 standard cubic feet = 1 barrel of oil equivalent. Totals may not exactly equal the sum of the individual entries due to rounding.

Undeveloped Proved converted to Developed Proved: Of the total amount of undeveloped proved reserves that Ecopetrol had at the end of 2019 (529 million boe), we converted approximately 69 million boe, or 13%, to developed proved reserves during 2020. Approximately 86% of the total conversion was primarily associated with the development of crude oil and gas projects in Ecopetrol S.A Fields as Castilla, Rubiales and Cupiagua fields, among others and 14% was associated with development execution in fields where our subsidiaries are operating.

All the explanations that were included in Changes in Proved Reserves apply for this section.

Reserves Process

Ecopetrol's reserves process is coordinated by Fidel Antonio Delgado Loria the Corporate Resources and Reserves Manager. Mr. Delgado Loria is a Petroleum Engineer with over 19 years of experience in the upstream sector of production business in Ecopetrol and other companies in the industry in Colombia and Venezuela. He received his engineering degree from Universidad Central de Venezuela. He reports to the Upstream Chief Financial Officer. In addition, the Ecopetrol reserves team is comprised of reserves coordinators who are geologists and petroleum engineers, each of them with more than fifteen years of experience in reservoir characterization, field development, estimation and reporting of reserves by SEC Guidelines. This team supports and interacts with the specialists involved in the estimation and reporting process, following an established procedure with its corresponding internal controls. As in previous years, reserves are estimated and certified by recognized external independent engineers, this year consisting of DeGolyer and MacNaughton, Gaffney Cline & Associates, Nederland, Sewell & Associates, Inc., Ryder Scott Company, and Sproule International Limited, in compliance with the definitions of the Society of Petroleum Engineers and the applicable SEC rules. According to our corporate policy, we report the reserves values obtained from the external engineers, even if they are lower than our expected reserves.

The reserves estimation process ends when the Corporate Reserves Manager consolidates the results and together, with the Development Vice-President and the Upstream Chief Financial Officer, presents the outcome to the Reserves Committee, which comprises the Ecopetrol Group's CEO, CFO and the Vice-President of Development and Production, among others. Results are later presented to the Audit and Risk Committee of the Board of Directors and finally reviewed and approved by the Board of Directors.

The aforementioned external independent engineering consultants have estimated and certified Ecopetrol's proved reserves as of December 31, 2020. These external engineers estimated 99% of our estimated net proved reserves for the year ended December 31, 2020, 2019 and 2018. The reserves reports of the external engineers are included as exhibits to this annual report.

Ecopetrol's reserves process uses deterministic methods which are commonly used internationally to estimate reserves. These methods whilst reliable, have some inherent uncertainty, and thus, estimates should not be interpreted as exact amounts. The majority of the producing proved reserves were estimated by applying appropriate decline curves or other performance relationships. In analyzing decline curves, reserves were estimated by calculating economic limits that are based on current economic conditions. In certain cases, where the methods previously employed could not be used, reserves were estimated by analogy with similar reserves for which more complete data was available.

Estimates of reserves were prepared by geological and engineering standard methods commonly used in the oil and gas industry. The method or combination of methods used in the analysis of each reserve was adopted from experience analogy reserves, including information on the stage of development, quality and completeness of basic data and production history.

The following table reflects the estimated proved reserves of oil and gas as of December 31, 2018 through 2020, and the changes therein.

Table 38 – Estimated Proved Reserves of Oil and Gas

	Colombia	North America	South America excluding Colombia	Total
Consolidated Companies	Net proved oil, NGL and gas reserves in mmboe			
At December 31, 2018	1,695.0	25.0	7.2	1,727.2
Revisions	78.4	4.3	0.2	83.0
Improved Recovery	94.3	-	-	94.0
Extensions and Discoveries	66.0	0.7	-	67.0
Purchases	-	164.0	-	164.0
Production	(236.0)	(4.2)	(1.4)	(242.0)
At December 31, 2019	1,698.0	189.7	5.6	1,893.0
Revisions	(49.8)	(20.8)	(0.9)	(71.5)
Improved Recovery	113.1	-	-	113.1
Extensions and Discoveries	40.8	1.8	-	42.7
Purchases	29.9	-	-	29.9
Sales	(1.0)	-	-	(1.0)
Production	(229.6)	(5.6)	(1.2)	(236.3)
At December 31, 2020	1,601.1	165.1	3.5	1,770.2

Note: Totals may not exactly equal the sum of the individual entries due to rounding. For more information regarding the potential impacts of oil prices on our reserve estimates, see the sections [Financial Review—Trend Analysis and Sensitivity Analysis](#) and [Risk Review—Risk Factors](#).

3.5.4 Joint Venture and Other Contractual Arrangements

We conduct our exploration and production business through a variety of contractual arrangements with the Colombian government or with third parties. Below is a general description of the main types of contractual arrangements to which we were a party as of December 31, 2020.

Association Contract

The purpose of this type of contract, created by Decree 2310 of 1974, is the exploration of the areas covered by the contract, and the exploitation of hydrocarbons found in that area. This type of contract, together with E&P contracts and Special Contracts (Casabe, La Cira and Teca-Cocorná fields) which are described below, are the most significant in terms of our production and proved reserves.

Under association contracts, the exploratory risk is assumed entirely by Ecopetrol S.A.'s contractual partner, the associate. If there is a discovery and Ecopetrol S.A. agrees that the relevant field is commercially viable, Ecopetrol S.A. will participate in the field's development. A joint account will be created, and Ecopetrol S.A. and the partner will participate in the expenses and investments in the proportions established in the corresponding contract. Ecopetrol S.A. will reimburse the direct exploratory expenses incurred by the contractual partner in the proportions established by the contract.

If Ecopetrol S.A. does not believe that the relevant field is commercially viable, the partner has the right to execute on its own all activities considered necessary for the field's exploitation as a "sole risk operation", and to be reimbursed for a defined percentage of all investments for such sole risk operation in accordance with the corresponding contract.

Every association contract provides for an executive committee that makes all technical, financial and operational decisions if Ecopetrol S.A. has agreed that a field is economically viable. All major decisions of this committee must be made unanimously by the parties.

The maximum term of an association contract is 28 years. The first six years of the contract are for the exploratory phase, which are extendible for 1 or 2 more years at the partner's request. The remaining time is for the exploitation phase.

Incremental Production Contract

We enter into incremental production contracts to obtain additional hydrocarbon production beyond a base production curve that is established based on the proven reserves of a specific field or well. Under this type of arrangement, Ecopetrol S.A. owns 100% of the hydrocarbons defined by the base production curve. The incremental production (*i.e.*, the hydrocarbon volume obtained beyond the basic production as a result of investment activities), will be owned by the contract parties in the proportions established by such contract.

The initial phase of an incremental production contract has a term of up to 3 years, in which the contractual partner executes an initial work program approved by Ecopetrol S.A. in order to gain the right (but not the obligation) to continue with the second phase. If Ecopetrol's partner decides to continue with the project for the second phase (the complementary phase), it must inform Ecopetrol S.A. in writing no later than 90 days prior to the termination date of the initial phase and deliver a proposed development plan for each covered field. The second phase is the production phase and has a maximum term of 22 years minus the length of the initial phase.

Incremental production contracts provide for an executive committee that is responsible for taking all decisions in order to approve, control and supervise all operations that take place during the duration of the contract. These contracts also provide for a steering committee, which is responsible for the supervision of the execution of the work programs, the annual budget and other items.

Special Contracts

We are party to a Joint Venture Contract for Exploration and Exploitation of "La Cira-Infantas" Area, "Teca Cocorná" Area; and a Services and Technical Collaboration Contract for the "Casabe" field.

Joint Venture Contracts for Exploration and Exploitation of “La Cira-Infantas” Area and of “Teca-Cocorná” Area

These contracts between Ecopetrol S.A. and SierraCol Energy, formerly known as Occidental Andina LLC, which were executed on September 6, 2005 and June 24, 2014, respectively, have as their purpose, a joint collaboration between the parties with the goal of increasing the economic value of the La Cira-Infantas fields and the Teca-Cocorná field by means of hydrocarbon exploration and production activities, including, among others, an incremental production project to improve the recovery factor, process optimization and exploratory activities.

Ecopetrol S.A. partially assigned its exploratory and production rights in the contracted areas to SierraCol Energy. Additionally, pursuant to these contracts, Ecopetrol S.A. provides financial resources and the preferential rights of use for the existing infrastructure in that zone and SierraCol Energy provides financial resources and the technical and operative experience in mature fields redevelopment projects and enhanced recovery technologies.

Ecopetrol S.A. is the operator under both Joint Venture Contracts, and on behalf of the parties is responsible for the conduction, execution and control, directly or via contractors, of the operational activities.

The La Cira-Infantas contract term is divided in three phases. The first phase lasts 180 days, the second 730 days and the third phase lasts up to the economical limit of the field.

The incremental production, after deduction of the royalties, is owned 52% by Ecopetrol S.A. and 48% by SierraCol Energy. These same percentages apply to the participation in the operational and direct expenses. Adjustments to the participations for the benefit of Ecopetrol S.A. will occur if there are high production levels or high prices.

The Teca-Cocorná contract term is divided in two phases. The first phase lasts three years, extendable for up to an additional year, the second term is 20 years and will be reduced by the term of any extensions of the first phase.

The basic production is 100% owned by Ecopetrol S.A. The incremental production, after deduction of the royalties, is owned 60% by Ecopetrol S.A. and 40% by SierraCol Energy. These same percentages apply to the participation in the operational and direct expenses. Adjustments to the participations for the benefit of Ecopetrol S.A. will occur if there are high production levels and high prices.

Services and Technical Collaboration Contract “Casabe”

The purpose of the contract executed between Ecopetrol S.A. and Schlumberger Surencó S.A. on April 26, 2004, was the evaluation, design and execution of work programs specifically with the purpose of increasing the value in the Casabe field by means of hydrocarbon exploration and production activities to obtain incremental production, application of new technologies, application of techniques for deposits management and operational costs reduction. Ecopetrol S.A. was the operator and Schlumberger Surencó S.A. kept the right of first option regarding the activities to be executed in the area of interest.

Both parties could invest in all the activities seeking to evaluate, obtain and incorporate incremental value in the area of interest. Such activities were developed directly by the parties or via contractors (Ecopetrol) or subcontractors (Schlumberger). Amounts expended pursuant to the contract were reimbursed depending on the incremental value (monthly valuation in US\$ of the results obtained from the execution of the work programs) created through the contract and the activities executed thereunder.

Both Ecopetrol S.A. and Schlumberger Surencó S.A. committed to assume full responsibility for damages and/or losses suffered by their respective personnel and goods in development of the contract, regardless of the cause. The maximum authority is the Executive Committee.

The contract had an initial term of 10 years and was amended several times to include an additional term of six years for which a new business was structured. The contract ended in April 2020 and is currently in liquidation.

The National Hydrocarbons Agency (ANH) and its Contracts

The ANH was created by Decree Law 1760 of 2003 and was given the authority to administer all national hydrocarbon reserves under contracts executed beginning on January 1, 2004. Decree Law 1760 of 2003 states, “The Empresa Colombiana de Petróleos, Ecopetrol, is split, its organic structure is modified, and the Agencia Nacional de Hidrocarburos and the Sociedad Promotora de Energía de Colombia S.A. are created.” Prior to January 1, 2004, Ecopetrol S.A. had the authority to contract with third parties for the exploration and production of new areas.

The creation of the ANH did not modify the rights or obligations of Ecopetrol or other parties with respect to contracts in existence before January 1, 2004 when the ANH was created and therefore Ecopetrol retains the authority to execute agreements with respect to all areas that it held prior to that date.

Below, we include a brief description of each type of contract that we have entered into with the ANH:

Technical Evaluation Agreement

This type of contract grants the contractor the right to develop technical evaluation operations with operational autonomy at its own cost and risk, seeking to appraise the hydrocarbon potential, with the purpose of identifying the zones of prospective interest in the area by means of the execution of an exploratory program. The contractor has the option to request the conversion of a technical evaluation agreement (Technical Evaluation Agreement or TEA) into one or more E&P Contracts that cover the area of the TEA (or a portion thereof).

The contractor can conduct evaluation activities for terms that vary between 18, 24 and 36 months, depending on the terms of reference of the ANH’s bidding round.

E&P Contract

The ANH enters into concession contracts pursuant to which the Nation grants exploration and production rights and receives royalties and taxes. In turn, the contractor provides 100% of the investment and expenses resources and receives 100% of the production after royalties and taxes. The ANH has named this contract an “Exploration and Production Contract” (E&P Contract).

The ANH only receives a percentage of oil revenues in two cases:

- i. when the international oil prices rise beyond a specified price (high price fee), above which the ANH has a right to participate in a share of the increased revenues generated, or
- ii. in the case of recognition of production rights in an extended contractual phase (additional production share).

Under all E&P contracts executed since ANH’s 2008 bidding round, the ANH receives a percentage of the production share, upon the commencement of the production phase, and not only in the extension phase of the contract (additional production share) as mentioned in the previous paragraph. In addition, ANH has economic rights when the price of oil exceeds a reference price set in the contract (high price fee) as well as the surface fee based on the hectares of the assigned area of the contract (both with and without production).

E&P contracts have three phases: (i) an exploration period, which term is 6 years counted from the effective date, renewable for two additional years, (ii) an evaluation period of two years, assuming a discovery is made, to determine the commercial potential of the discovery and (iii) a production period, which is, with respect to each production field, 24 years plus any extensions, which are counted from the date of declaration of commerciality of the corresponding field. The abovementioned terms have been modified during ANH’s 2014 bidding round for unconventional and offshore reservoirs to an exploration period of nine years and a 30-year production period. As per the new model E&P contract published by the ANH on June 29, 2018, the term of the evaluation period for offshore contracts entered into as of 2019 will be three, five or seven years, depending on the depth of the water where the discovery is located.

ANH and Ecopetrol Agreements (Convenios)

Decree Law 1760 of 2003, established that the rights over the production area and over the movable and immovable assets of: (i) all fields that were directly operated by Ecopetrol S.A. as of December 31, 2003, and (ii) all fields in which there were an association contract before said date will continue to belong to Ecopetrol S.A.

Pursuant to Article 2 of Decree 2288 of 2004, which regulates Decree Law 1760 of 2003, Ecopetrol S.A. must execute an agreement with the ANH to regulate the exploration and exploitation terms and conditions of the relevant area, which was previously subject to an association contract.

Decree 2288 of 2004 also established that Ecopetrol S.A. would have to execute agreements with ANH covering fields directly operated by Ecopetrol S.A. Under these agreements ANH recognizes the exclusive right of Ecopetrol S.A. to explore and exploit the hydrocarbons property of the Nation that are obtained in the areas they cover, until resource depletion or until Ecopetrol S.A. returns the area to the Nation through the ANH.

These agreements also provide the conditions under which Ecopetrol S.A. is able to assign, partially or completely, its rights and duties thereunder to third parties.

3.6 Transportation and Logistics

3.6.1 Transportation Activities

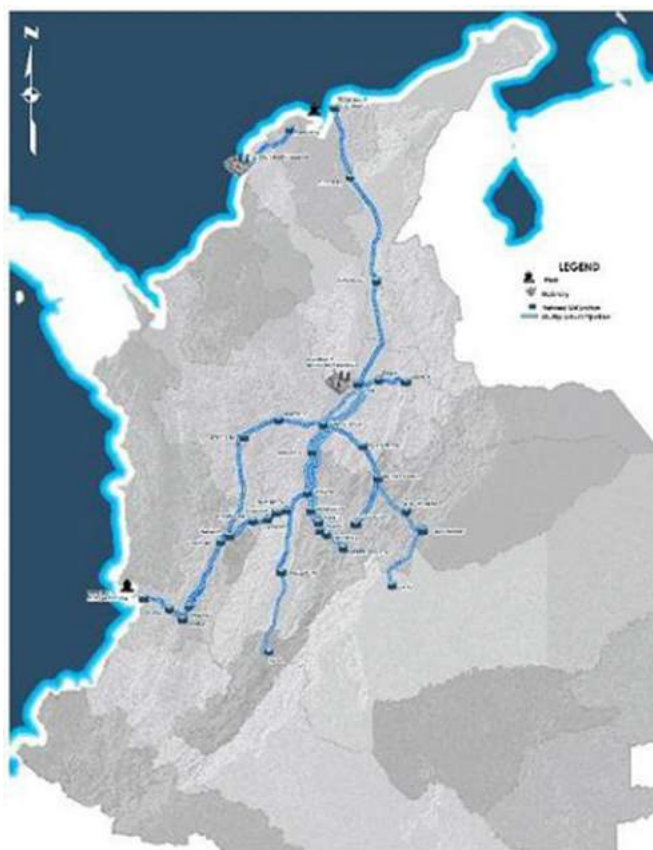
The transportation and logistics segment includes the transportation of crude oil, motor fuels, fuel oil and other refined products including diesel, jet and biofuels. We conduct most of these activities through our wholly owned subsidiary Cenit and its subsidiaries.

The map below shows the locations of the main transportation networks owned by our business partners and us.

Graph 5 – Map of Oil Pipelines



Graph 6 – Map of Multi-purpose Pipeline



The table below sets forth the volumes of crude oil and refined products transported through the crude oil pipelines and multi-purpose pipelines owned by us.

Table 39 – Volumes of Crude Oil and Refined Products Transported

	For the year ended December 31,		
	2020	2019	2018
	(thousand bpd)		
Crude oil transport ⁽¹⁾	785.6	877.7	836.2
Refined products transport ⁽²⁾	231.5	275.3	273.4
Total	1,017.1	1,153.0	1,109.6

(1) The crude oil transported volumes correspond to the following systems: Ocesa Segment 3, ODC, Vasconia-Galan, Ayacucho-Galan, Ayacucho-Coveñas and Trasandino Pipeline.

(2) The pipelines transporting refined products include the following: Galan-Sebastopol, Galan-Salgar, Galan-Bucaramanga, Buenaventura-Yumbo and Cartagena-Baranoa.

The volume of crude oil transported by Cenit's main systems and those of its subsidiaries decreased by 10.5% in 2020 compared to the previous year. This decrease was mainly the result of (i) lower production levels, primarily due to low crude oil prices in the international markets (ii) a decrease in crude oil demand, primarily due to the lockdowns instituted around the world in response to the COVID-19 pandemic, which in turn resulted in lower transported volumes to the refineries and (iii) slow recovery rates at production fields, primarily due to market uncertainty and lower consumption. Of the total volume of crude transported by oil pipelines, approximately 82.3% belonged to the Ecopetrol Group.

The volume of refined products transported by Cenit decreased by 15.9% in 2020 compared to the previous year, mainly due to the impact caused by the different sanitary measures taken by the Colombian government to control the spread of COVID-19. More specifically, measures such as lockdowns and mobility restrictions that led to a decrease in demand for refined products and hence reduced wholesalers' needs to transport such products through Cenit's pipelines. Of the total volume of refined products transported by multi-purpose pipelines in 2020, 35.7% belonged to the Ecopetrol Group.

Transportation Capacity

Our main crude oil pipeline systems' operating capacity decreased from 1,486 kbd in 2019 to 1,469 kbd in 2020 primarily due to scheduled maintenance. Our main multi-purpose pipeline transportation capacity increased from 511 kbd in 2019 to 519 kbd in 2020.

References to our crude oil transportation capacity in this annual report refer to the capacity of the pipelines that belong to Cenit and its subsidiaries to transport crude oil volumes either to the refineries or to our export facilities. In addition, we have other feeder systems that transport oil volumes from producing facilities or other pumping stations to these main pipelines. References to our refined products transportation capacity refer to the capacity of pipelines that begin in the Galan station (Barrancabermeja refinery) and Cartagena station (Cartagena refinery).

3.6.1.1 Pipelines

As of December 31, 2020, we, directly or indirectly with private partners, own, operate and maintain an extensive network of crude oil and multi-purpose pipelines. These pipelines connect our own and third-party production centers, import facilities and terminals to refineries, major distribution points and export facilities in Colombia.

Cenit directly owns 45% of the total crude oil pipeline shipping capacity in Colombia. When aggregated with the crude oil pipelines in which Cenit owns an interest, Cenit owns 81% of the oil pipeline shipping capacity in Colombia. By December 31, 2020, our network of crude oil and multi-purpose pipelines was approximately 9,127 kilometers in length. The transportation network consists of approximately 5,387 kilometers of main crude terminals and oil pipeline networks connecting various fields to the Barrancabermeja refinery and Cartagena refinery, as well as to our export facilities.

We also own 3,739 kilometers of multi-purpose pipelines for transportation of refined products from the Barrancabermeja and Cartagena refineries to major distribution points. Out of the 5,378 kilometers of crude oil pipelines, owned by us, 3,175 kilometers of crude oil pipeline are wholly owned, and 2,212 kilometers of crude oil pipeline are owned through non-wholly owned subsidiaries.

The following table sets forth our main pipelines in which we own an indirect interest as of December 31, 2020.

Table 40 – Our Main Pipelines

Pipeline	Kilometers	Capacity (kbd)	Product Transported	Origin	Destination	Indirect Ownership Percentage
Caño Limón-Coveñas	774	250	Crude Oil	Caño Limón	Coveñas	100.00%
Oleoducto de Alto Magdalena (OAM)	391	102	Crude Oil	Tenay	Vasconia	95.80%
Oleoducto de Colombia (ODC)	483	236	Crude Oil	Vasconia	Coveñas	73.00%
Oleoducto Central – Ocesa ⁽¹⁾	848	745	Crude Oil	Cupiagua	Coveñas	72.65%
Oleoducto de los Llanos (ODL) ⁽²⁾	260	296	Crude Oil	East fields	Monterrey Cusiana	65.00%
Oleoducto Bicentenario de Colombia ⁽³⁾	230	110	Crude Oil	Araguaney	Banadia	55.97%

(1) Ocesa has four segments with different capacities. 745 kbd refers to the capacity of segment two (El Porvenir-Vasconia). The capacity of the other segments are as follows:

- a. Cupiagua-Cusiana (segment zero): 198 kbd
- b. Cusiana-El Porvenir (segment one): 745 kbd
- c. Vasconia-Coveñas (segment three): 550 kbd

(2) Transportation capacity for this pipeline is measured by using crude oil viscosity of 1.350 cStk (30° C).

(3) Represents the contractual crude oil transportation capacity for the pipeline currently in operation.

As of December 31, 2020, we owned 75 stations, 41 located in crude oil pipelines, 30 in refined products pipelines, 2 in crude oil ports and 2 in refined product ports.

As of December 31, 2020, we had a nominal storage capacity associated with the transportation network of 16.7 million barrels of crude oil and 4.7 million barrels of refined products. We do not own any tankers.

Pipeline Projects

San Fernando – Monterrey

The San Fernando – Monterrey project objectives and scope include ensuring the ability to transport 300,000 barrels per day at 300 cSt of diluted crude oil from the Chichimene and Castilla fields to the Monterrey pumping station and the transportation of 45,000 barrels per day of diluent (naphtha) between the Apiay station and the Castilla and Chichimene fields. The project foresees the construction of a new 30" 119-km crude oil pipeline, a new pumping station to include reception, storage and dilution facilities, the conversion of the existing pipeline of 10" between the Castilla II plant and the Apiay station, and the construction of a new 10" pipeline between Chichimene and San Fernando fields in order to transport diluent (naphtha) from the Apiay station to the San Fernando plant.

In 2018, the project completed the maximum pumping test, in accordance with the operational system parameter and owner's requirements; as a result, the main functional services of the project were validated. The construction, startup phase and commissioning of all systems were completed in January 2018. The system is able to transport crude oil at 750 cSt between the San Fernando and Apiay stations. During 2019, 17 kms of the 30" oil pipeline infrastructure designed to bypass the Apiay station were under construction. The project was commissioned in April 2020. The commissioning of this project resulted in the reduction of 13,430 tons of CO2 emissions for the year and it reduced our energy and drag reducing agent (DRA) consumption by approximately 30%.

Coveñas - Cartagena

The objective of the Coveñas - Cartagena project is to increase this system's reliability, capacity, and pipeline infrastructure. To date, this pipeline has a nominal capacity of 135 kbd and feeds the Cartagena refinery with national crudes. As the demand for national crudes from the Cartagena refinery continued to increase, Cenit identified a need to expand this system. In May 2020, Cenit approved the project to increase the system's nominal capacity by 20 kbd to 155 kbd. The project is currently under construction and it is expected to be in operation by November 2021.

Replacement of Tanker Loading Unit TLU - Coveñas

In 2019, Ocesa invested US\$ 32.8 million in offshore infrastructure as a part of the investment plan signed with the Infrastructure National Agency (ANI), which allows Ocesa to continue operating in a public area of the Morrosquillo Gulf, loading tankers with a capacity of up to 2 million barrels of crude oil. Investments during 2019 consisted of the following: the acquisition of a new, more efficient CALM Turret Buoy and PLEM (Pipeline End Manifold), which will improve the loading times of the tankers; the acquisition of two fiber optic systems, one of which communicates the TLU-2 with land and the other monitors the deformations of the submarine pipeline caused by sea currents; the maintenance of a string of floating hoses; the improvement of the inland transport and handling system; and the completion of integrity works such as inspections of the underwater pipeline, which lead to the repair of four welded joints of 42" and the stabilization of the last 72 meters of the seabed of the offshore pipeline.

In 2020, Ocesa invested US\$ 9.1 million in offshore infrastructure according to an updated investment plan signed with the ANI on December 4, 2019. The new CALM Turret buoy and PLEM are in Colombia and are in the preparation phase with integration tests currently taking place prior to the replacement of the TLU system. The installation of two fiber optic systems was successfully completed.

The maintenance of floating marine hoses and the integrity works of the subsea pipeline was performed according to the plan.

Ocesa Segment 3 Connection to CENIT Tanks in Coveñas

Seeking operational efficiencies for the Ocesa terminal in Coveñas, the Segment 3 Connection Project was developed. This connection consists of enabling direct deliveries from the entrance of the Ocesa pipeline to the tank system of the CENIT station in Coveñas. Previously, crude oil was received in Ocesa's tanks in Coveñas and then transferred to CENIT's tanks. The operation of this connection is governed by an agreement between CENIT and Ocesa, which defines the rate and operating conditions that should be in place with the project expected to result in additional income for Ocesa.

In 2019, the engineering for the project was completed and the execution phase was approved.

In 2020, due to the impact of the COVID-19 pandemic in the oil and gas industry, construction was postponed until October 2020, with construction, pre-commissioning and commissioning activities completed in December 2020. The tests and entry into service of the system were undertaken in January 2021 and the project is currently fully operational.

Vasconia Energy Recovery (RECVA)

Given that Vasconia station operates 24 hours a day, an opportunity was identified to recover energy from the system, converting hydraulic energy (flow and pressure) into electrical energy through the installation of a hydraulic power recovery turbine (HPRT). In 2019, the HPRT was purchased, manufacturing was completed, and the engineering development was concluded.

In May 2020, the HPRT was received on site, and during Ocesa's scheduled plant shutdown in November 2020, the turbine connection points were installed in the existing process lines and 20" valves were installed in the high- and low-pressure line. The project is expected to be commissioned at the end of June 2021.

3.6.1.2 Export and Import Facilities

We currently have concessions granted by the Colombian Government for four export/import docks for crude oil and refined products: Coveñas, Tumaco, Pozos Colorados and Cartagena. Our export capacity reached 1.87 million barrels per day for crude oil. Our import capacity of refined products and crude oil reached 0.61 million barrels per day and 0.14 million barrels per day, respectively.

Our crude oil loading facilities can load tankers of up to 350 thousand deadweight tonnage (DWT). Adjacent to these loading facilities we also have storage facilities that are capable of storing 9.58 million barrels. Our docks used for import and export of refined products can load tankers of 70 thousand DWT. Additionally, these facilities have storage capacity of up to 1.1 million barrels.

3.6.2 Other Transportation Facilities

We have entered into transportation agreements with tanker truck and barge companies in order to transport crude oil from locations that do not have pipeline connections to refineries and export facilities. The volume of refined products that cannot be transported by pipelines or tanker trucks because of capacity limitation is transported by barges. During 2020, 18.4 million barrels of crude oil and refined products were transported by tanker trucks, and 5.7 million barrels of refined products were transported by barges, particularly using the Magdalena River, connecting Barrancabermeja with Barranquilla and Cartagena.

3.6.3 Marketing of Transportation Services

Cenit and its subsidiaries' main line of business is the crude oil pipeline transport (76.9% of revenues), followed by the refined products pipeline transport (14.26% of revenues) and ports and related services (4.25% of revenues). Both crude and refined product pipeline transport are regulated activities; crude oil pipeline transport services are regulated by the Ministry of Mines and Energy, while refined product pipeline transport services are regulated by the Comisión de Regulación de Energía y Gas (CREG).

Transportation contracts of crude oil may take several forms: ship or pay (payment for the availability of a fixed capacity in the system), ship and pay (payment for volumes actually transported) or spot contracts. The main users for the crude oil transportation business are Ecopetrol S.A., Frontera Energy, Trafigura, Mansarovar, Metapetroleum and Gran Tierra, who collectively represented 74.94% of this business segment's revenues in 2020. Transportation services for crude oil provided to Ecopetrol S.A. represented 87.32% of this business segment's crude oil transport revenues.

Cenit also transports refined products. Its main client for this service is Ecopetrol S.A., which accounted for 44.92% of refined products pipeline transport revenues in 2020, mainly due to the transport of naphtha, diesel, and gasoline. Cenit also has 31 other fuel wholesalers' customers for whom it transports refined products. The most significant among them are Organización Terpel, Primax Colombia, Chevron Petroleum Company, Biocombustibles S.A.S. and Petrobras Colombia.

Deregulated businesses, such as ports and crude-loading facilities, represent a smaller portion of Cenit and its subsidiaries revenue (4.25% in 2020). Clients for these businesses include some of the same parties for which Cenit provides crude oil and refined products transportation services.

Developments with certain clients of Bicentenario and Cenit

Oleoducto Bicentenario de Colombia S.A.S.

During July 2018, the carriers Frontera Energy Colombia Corp. (Frontera), Canacol Energy Colombia S.A.S. (Canacol) and Vetra Exploración y Producción Colombia S.A.S. (Vetra and, together with Frontera and Canacol, the Carriers) sent letters to Oleoducto Bicentenario de Colombia S.A.S. (Bicentenario) alleging there were early termination rights under the Ship-or-Pay Transport Agreements entered by each of them and Bicentenario in 2012 (the Transport Agreements). Bicentenario has rejected the terms of the letters, noting that there is no option for early termination and reiterating to the Carriers that the Transport Agreements are current and therefore the Carriers must fulfill their obligations under the Transport Agreements in a timely fashion. Under Bicentenario's understanding that the Transport Agreements remain current and that the Carriers are in violation of their obligations under such agreements, Bicentenario declared the Carriers delinquent because of their failure to pay for transport service under the aforementioned agreements. Consequently, Bicentenario executed the standby letters of credit posted as guarantee for the Transport Agreements. On October 19, 2018, Bicentenario notified Frontera of the existence of a "Dispute" pursuant to Clause 20 of the respective Transport Agreement and moved to the party dispute settlement stage as provided for in such clause. Such discussions ended without an agreement on December 19, 2018. On January 28, 2019, Bicentenario filed an Arbitration Claim against Frontera in accordance with the arbitration clause of the Transportation Agreement to claim any compensation, indemnification or other restitution deriving from the alleged early termination of said agreements.

Similarly, on November 1, 2018, Bicentenario notified Vetra and Canacol of the existence of a "Dispute" pursuant to Clause 20 of the respective Transport Agreement and moved to the party dispute settlement stage as provided for in each such respective clause. Such discussions ended without agreement in March 2019.

On June 14, 2019, and June 26, 2019, Bicentenario filed arbitration claims against Vetra and Canacol, respectively, in accordance with the arbitration clause of the Transportation Agreement to claim any compensation, indemnification or other restitution deriving from the alleged early termination of said agreements.

As part of the litigation strategy of Bicentenario, the above-mentioned claims were withdrawn, and new claims were filed, as explained below:

On November 12, 2019, Bicentenario filed an arbitration claim against Frontera, before the Center for Arbitration and Conciliation of the Bogotá Chamber of Commerce (Case No. 119448), in order to obtain the corresponding compensation, indemnification or other restitution deriving from the alleged early termination of the Transportation Agreement up to the end of the *Ship or Pay* term (2024).

On December 10, 2019, Bicentenario filed an arbitration claim against Vetra, before the Center for Arbitration and Conciliation of the Bogotá Chamber of Commerce (Case No. 120089) in order to obtain the corresponding compensation, indemnification or other restitution deriving from the alleged early termination of the Transportation Agreement up to the end of the *Ship or Pay* term (2024).

On December 26, 2019, Bicentenario filed an arbitration claim against Canacol, before the Center for Arbitration and Conciliation of the Bogotá Chamber of Commerce (Case No. 120179) in order to obtain the corresponding compensation, indemnification or other restitution deriving from the alleged early termination of the Transportation Agreement up to the end of the *Ship or Pay* term (2024).

On December 3, 2019, Bicentenario also filed an arbitration claim against its shareholders Frontera, Pacific OBC, Corp., Pacific OBC 1, Corp., Pacific OBC 4, Corp., Canacol and Vetra under clause 23(d) of the *Acuerdo Marco de Inversión* before the Center for Arbitration and Conciliation of the Bogotá Chamber of Commerce (Case No. 119872) contending that since Frontera, Pacific OBC, Corp., Pacific OBC 1, Corp., Pacific OBC 4, Corp. Canacol and Vetra did not perform the actions requested by Bicentenario necessary to support the indebtedness of the Bicentenario Project, they are in breach of the *Acuerdo Marco de Inversión* and therefore must compensate and indemnify Bicentenario due to their unlawful conduct. This arbitration claim was withdrawn by Bicentenario on October 22, 2020, in order to present its claims on the arbitration described in the following paragraph.

On December 3, 2019, Frontera, Pacific OBC Corp., Pacific OBC 1, Corp., Pacific OBC 4, Corp. filed an international arbitration request against Bicentenario and Cenit under Commerce (Case No. 120488) to resolve the disputes between the parties concerning: (i) the alleged dividends due by Bicentenario, (ii) the alleged abuse of Cenit as the majority shareholder of Bicentenario, (iii) the termination of the Transportation Agreements and (iv) the tariffs dispute with Cenit.

On January 10, 2020, Bicentenario filed an arbitration claim against Canacol under the storage agreement (*contrato de almacenamiento terminal coveñas*) before the Center for Arbitration and Conciliation of the Bogotá Chamber of Commerce (Case No. 120386) in order to obtain the corresponding compensation, indemnification or other restitution deriving from the alleged early termination of the storage agreement up to the end of the *Ship or Pay* term (2024). See the section *Business Overview—Marketing of Transportation Services—Bicentenario, CENIT and Frontera Settlement Agreement*.

Cenit Transporte y Logística de Hidrocarburos S.A.S.

In July 2018, the carriers Frontera, Vetra and Canacol (carriers) sent notifications to Cenit Transporte y Logística de Hidrocarburos SAS (Cenit) alleging they were exercising their early termination right under the Ship-or-Pay Crude Oil Transport Agreements (SoP agreements) entered among each of them and Cenit for the transportation of crude oil through the Caño Limón – Coveñas pipeline (owned by Cenit).

In response to the alleged termination of SoP Agreements, CENIT issued letters stating its position and that the alleged event which would have given the carriers early termination rights had not occurred as provided for in Clause 13.3 and other clauses of the aforementioned SoP agreements. In the same letters, CENIT stated that it would continue invoicing and charging for the transport services as stipulated in the SoP agreements, since they remain in force, and therefore, Carriers must fulfill their contractual obligations.

In November 2018, CENIT filed an arbitration claim against Frontera Energy Group claiming that SoP Agreements are in full force and effect and that Frontera is obliged to comply with their terms and conditions. In similar terms, arbitration claims were also filed against Vetra and Canacol in March and June 2019, respectively. See the section *Business Overview—Marketing of Transportation Services—Bicentenario, CENIT and Frontera Settlement Agreement*.

Bicentenario, CENIT and Frontera Settlement Agreement

On November 17, 2020, CENIT and Frontera reached an agreement, for the joint filing of a petition for a binding settlement which, upon completion and approval by the competent Colombian court, will resolve all the disputes pending among them, related to the Caño Limón – Coveñas pipeline, and will terminate all the pending arbitration proceedings related to such disputes. This transaction eliminates any uncertainty related to the potential outcomes of the disputes, thus protecting the interests of all the parties and those of their stakeholders and create new business opportunities for the parties involved. The settlement arrangement includes a full and final mutual release upon closing of all present and future amounts claimed by all parties in respect of the terminated transportation contracts for the Bicentenario and Caño Limón – Coveñas pipelines. Frontera will also enter into new transportation contracts with CENIT and Bicentenario. The new ship or pay commitment is projected to be approximately 3,900 bbls/day, based on the current oil price, for a term of five years subject to adjustments, at a current rate of US\$ 11.5/bl. Frontera will not have to make payments for oil it may have to ship through alternate pipelines. These contracts will allow CENIT and Bicentenario to obtain payment of certain amounts included in the settlement, during the term of the contracts. Additionally, as part of the agreement Frontera will transfer to Cenit its 43.03% of the outstanding shares of Bicentenario, and will transfer to Bicentenario its participation in the Bicentenario pipeline line fill. The arrangement is conditional upon certain regulatory approvals, including approval of the settlement arrangement as a conciliation under Colombian law, which requires an opinion from the Attorney General's Office (*Procuraduría General de la Nación*), which was issued on March 24, 2021, and approval of the Administrative Tribunal of Cundinamarca. Once all approvals are obtained and the parties perform all their obligations under the agreement, the Ecopetrol Group's stake in Bicentenario will be 100%. As of the date of this annual report, the final approval by the Administrative Tribunal of Cundinamarca was pending.

Bicentenario, Cenit and Canacol Settlement Agreement

On October 30, 2020, Cenit and Canacol reached an agreement to settle all their aforementioned disputes. The settlement arrangement includes a full and final mutual release upon closing of all present and future amounts claimed by all parties in respect of the terminated transportation contracts for the Caño Limón – Coveñas pipelines. On November 18, 2020, the competent arbitration tribunal approved the settlement agreement entered into by Cenit and Canacol, according to which Canacol was obliged to transfer all its outstanding shares in Bicentenario to Cenit. Additionally, as part of the settlement, Canacol entered into new transportation contracts with Cenit. These contracts will allow Cenit to obtain payment of certain amounts included in the settlement, during the term of the contracts. Furthermore, on March 8, 2021, Bicentenario and Canacol reached an agreement to settle all their aforementioned disputes. The agreement established a formula that seeks to end all contractual obligation disputes between the parties and settle all the outstanding obligations between the companies. As of the date of this annual report, approval of the settlement agreement between Bicentenario and Canacol is still pending.

Bicentenario, Cenit and Vetra Settlement Agreement

On November 23, 2020, Cenit and Vetra reached an agreement to settle all their aforementioned disputes. The settlement arrangement includes a full and final mutual release upon closing of all present and future amounts claimed by all parties in respect of the terminated transportation contracts for Caño Limón – Coveñas pipelines. On February 18, 2021, the competent arbitration tribunal approved the settlement agreement entered into by Cenit and Vetra, according to which Vetra is obliged to transfer all its outstanding shares in Bicentenario to Cenit and to make a cash payment for the remaining balance of the amounts included in the settlement. Furthermore, on January 13, 2021, Bicentenario and Vetra reached an agreement to settle all their aforementioned disputes. The agreement established a formula that seeks to end all contractual obligations between the parties and settle all the outstanding obligations between the companies. As of the date of this annual report, approval of the settlement agreement between Bicentenario and Vetra is still pending.

3.7 Refining and Petrochemicals

3.7.1 Refining

Our main refineries are the Barrancabermeja refinery, which Ecopetrol S.A. directly owns and operates, and a refinery in the Free Trade Zone in Cartagena owned by Reficar, a wholly owned subsidiary of Ecopetrol S.A., who operates this refinery and two other minor refineries -Orito and Apiay-, but these are considered part of the upstream segment since the majority of production is for self-consumption.

Our refineries produce a full range of refined products, including gasoline, diesel, jet fuel, LPG and heavy fuel oils, among others.

The following table sets forth our average daily installed and actual refinery capacity for each of the last three years:

Table 41 – Average Daily Installed and Actual Refinery Capacity

	For the year ended December 31,								
	2020			2019			2018		
	Capacity (bpd)	Throughput (bpd)	Use (%)	Capacity (bpd)	Throughput (bpd)	Use (%)	Capacity (bpd)	Throughput (bpd)	Use (%)
Barrancabermeja	250,000	179,210	72%	250,000	218,612	87%	250,000	221,946	89%
Reficar	150,000	140,866	94%	150,000	155,049	103%	150,000	151,331	101%
Apiay	2,500	887	35%	2,500	779	31%	2,500	939	38%
Orito	2,300	1,074	47%	2,300	1,314	57%	2,300	1,228	53%
Total	404,800	322,038	80%	404,800	375,754	93%	404,800	375,444	93%

3.7.1.1 Barrancabermeja Refinery

The Barrancabermeja refinery supplies approximately 51.9% of the fuels consumed in Colombia according to internal calculations made by us and Colombia's fuel consumption as reported by the Ministry of Finance.

The following table sets forth the production of refined products of the Barrancabermeja refinery for the periods indicated.

Table 42 – Production of Refined Products from the Barrancabermeja Refinery

	For the year ended December 31,		
	2020	2019	2018
	(bpd)		
LPG, Propylene and Butane	9,101	10,114	11,813
Gasoline Fuels and Naphtha	50,167	64,063	58,623
Diesel	54,261	57,469	58,305
Jet Fuel and Kerosene	11,910	24,320	23,604
Fuel Oil	25,112	32,009	36,636
Lube Base Oils and Waxes	577	797	729
Aromatics and Solvents	2,274	2,652	3,106
Asphalts and Aromatic Tar	27,018	29,593	31,104
Polyethylene, Sulphur and Sulphuric Acid	856	1,139	1,479
Total	181,276	222,156	225,399
Difference between Inventory of Intermediate Product	1,046	(703)	(1,018)
Total Production	182,322	221,453	224,381

In 2020, total production from the Barrancabermeja refinery decreased by 17.7% compared with 2019 mainly due to a contraction in the demand for fuels and petrochemical products caused by mobility restrictions imposed at the national level due to the health emergency caused by the COVID-19 pandemic.

We own and operate four petrochemical plants and one paraffin and lube plant located within the Barrancabermeja refinery. In 2020, we produced 20,945 tons of low-density polyethylene, a decrease of 37.1% compared to the production of 33,309 tons in 2019. This decrease was primarily due to the impact on the operation of ethylene production in the cracking units as a result of a lower demand for gasoline due to the health emergency caused by the COVID-19 pandemic. We produced 551.1 mboe of aromatics (benzene, toluene, xylene, orthoxylene, heavy aromatics and cyclohexane), a 16.2% decrease as compared with the production of 657.9 mboe of aromatics in 2019. The decrease was mainly the result of the decrease in demand by our national clients given a decrease in their activity, which in turn was due to mobility and work restrictions imposed at the national level due to the health emergency caused by the COVID-19 pandemic.

The gross refining margin decreased from US\$ 10.6/Bl in 2019 to US\$ 9.1/Bl in 2020, primarily due to the lower positive differential in product prices versus the Brent price, and the higher cost of the crude oil basket. The average conversion index for the Barrancabermeja refinery was 87.6% in 2020 and 86.8% in 2019. This increase was primarily due to a better quality of the diet and higher deliveries of asphalt compared to the crude load of 2019.

3.7.1.2 Cartagena Refinery

The following table sets forth the production of refined products from the Cartagena Refinery for the periods indicated.

Table 43 – Production of Refined Products from the Cartagena Refinery

	For the year ended December 31,		
	2020	2019	2018
	(bdp)		
LPG, Propylene and Butane	3,321	4,255	4,227
Gasoline Fuels and Naphtha	43,259	49,904	51,703
Diesel	72,170	79,069	76,833
Jet Fuel and Kerosene	7,424	9,331	8,057
Fuel Oil	2,375	3,660	4,671
Sulphur	466	585	581
Total	129,015	146,804	146,072
Difference between Inventory of Intermediate Product	5,318	2,262	39
Total Production⁽¹⁾	134,333	149,066	146,111
Petcoke (Metric Tons)	828,931	922,460	984,558

(1) Does not include petcoke.

The following tables set forth the imports and sales of refined products from the Cartagena Refinery for the periods indicated.

Table 44 – Imports and Sales of Refined Products from the Cartagena Refinery

	For the year ended December 31,		
	2020	2019	2018
	(bpd)		
Imports			
Motor Fuels	-	521	-
Jet Fuel and Kerosene	-	-	466
LPG and Butane	1,132	990	739
Total Imports	1,132	1,511	1,205

During 2020, the Cartagena refinery imported butane in order to achieve the planned feed of the Butamer Unit and to increase the production of alkylate.

	For the year ended December 31,		
	2020	2019	2018
	(bdp)		
Sales			
Motor Fuels	43,979	49,865	52,126
Diesel	73,188	77,981	78,007
Jet Fuel and Kerosene	7,394	9,063	8,082
Fuel Oil	2,552	3,713	4,704
Other Products	24,275	22,435	19,942
Total Sales	151,388	163,057	162,861

Total sales decreased from US\$3,904 million in 2019 to US\$2,399 million in 2020. A total of 51.6 million barrels of crude were processed in 2020 compared to 56.6 million barrels of crude processed in 2019. Exports to international markets represented 43.66% of total sales (US\$1,047 million).

The Cartagena refinery's 2020 figures already reflect the operation of all units. The gross refining margin decreased to US\$6.6/Bl in 2020 from US\$9.2/Bl in 2019 mainly due to the reduction of product demand as consequence of the COVID-19 public health emergency and the Russia-Saudi Arabia oil price war. Throughput decreased during 2020, from an average of 155 mbd in 2019 to 141 mbd in 2020.

3.7.1.3 Esentia S.A.

During 2020, Esentia's production totaled 490 thousand tons of petrochemical products, a 6.5% increase compared to the 460 thousand tons produced in 2019, primarily due to effective articulation of the supply chain and the ability of Esentia to maintain its work schedule in in safe conditions given the COVID-19 pandemic. Average capacity increased by 10 thousand tons in 2020, primarily due to the expansion of the extruder capacity and the installation of a second desorber, investments that improved efficiency and reliability in plant performance. The total contribution margin in 2020 (including the contribution of polypropylene, polyethylene and masterbatches) was 3% lower than in 2019 (from US\$ 242 per ton in 2019 to US\$ 235 per ton in 2020), even in adverse market conditions caused by the COVID-19 pandemic.

Table 45 – Operating Capacity of Esentia

	For the year ended December 31,		
	2020	2019	2018
	(Metric Tons)		
Average capacity	480,000	470,000	470,000
Throughput	489,627	459,737	447,290
% Use	102%	98%	95%

3.7.1.4 Invercolsa

During 2020, Inversiones de Gases de Colombia S.A. (Invercolsa), registered 1.26 million users of natural gas, a slight increase of 3% compared to the 1.22 million users of natural gas in 2019, due to the contraction of residential natural gas installations given the COVID-19 pandemic. In 2020, Invercolsa continued to integrate its operations into the Ecopetrol Group, in connection with the increase in stake completed by Ecopetrol in November 2019. Invercolsa embraced an HSE culture and leadership model based on Ecopetrol Group's practices.

3.7.1.5 Biofuels

As of the date of this annual report, we have investments in the biofuel company Ecodiesel Colombia S.A., in which we own 50% of the shares, currently in operation with a theoretical capacity of 100,000 tons per year of biodiesel.

On March 10, 2020, Bioenergy S.A.S. and Bioenergy Zona Franca S.A.S were admitted to reorganization processes by the Superintendence of Companies of Colombia under Law 1116 of 2006. The reorganization process ended on June 24, 2020, with applicable regulatory authority ordering the start of the liquidation process of both companies. For more information, see the section *Risk Review—Legal Proceedings and Related Matters*.

3.7.2 Marketing and Supply of Refined Products

We are the main producer and supplier of refined products in Colombia. We market a full range of refined and feedstock products, including regular and high-octane gasoline, diesel fuel, jet fuel, LPG and petrochemical products, among others.

Domestic sales of products decreased by 53 mboed, 17% lower as compared to 2019. This decrease is primarily the result of the mandatory lockdowns imposed by the Colombian national government in order to curb the spread of the COVID-19 pandemic, which in turn led to sales of middle distillates and gasoline.

During 2020, 3.5 million barrels of diesel and 2.5 million barrels of gasoline produced by the Cartagena Refinery were allocated to complement the supply from the Barrancabermeja refinery and fulfill Colombia's demand, avoiding larger imports and allowing Ecopetrol to maintain the share of the national market. In the same way, 5.1 million barrels of diluent produced by Reficar were used to transport crude reducing diluent imports. In addition, Ecopetrol imported petrochemicals in order to complement the national supply, generating additional sales of lubricating bases, polyethylene, hexanes and others.

Exports of products decreased by 9% compared to 2019, 8 mboed from Reficar and 5 mboed from Ecopetrol, primarily due to lower crude oil runs at the refineries.

3.8 Research and Development: Intellectual Property

Our innovation and technology center is the Colombian Petroleum Institute (ICP for its Spanish acronym), established in 1985 and located in Piedecuesta, Santander. Technology and innovation as a key lever of our TESG strategy, are essential to our efforts to add value to our business segments through the development of proprietary technologies and competitive advantages and the adaptation of third-party technologies to our processes, and for embracing the low carbon energy transition.

Our research, technology development and innovation efforts are focused on four main pillars: (i) extending the technical limits for reserves growth, (ii) increasing the efficiency and sustainability of our operations, (iii) preparing the corporation for decarbonization and energy transition, and (iv) increasing the digitalization of our company. The scope of the Colombian Petroleum Institute activities covers all of our value chain segments: exploration, production, refining, transportation and sales and marketing, as well as environmental sustainability and asset integrity.

We will monitor the progress of technological advances that could enable us to increase the share of low emissions hydrogen in our refining and petrochemical processes. As water is a fundamental resource, our efforts will also include a technology-enabled water management program that encompasses the conservation, recycling, reuse and valorization of production water streams. Finally, we are also exploring avenues for the production of high performance, materials from petroleum molecules, for advanced non-combustion applications.

Each year Ecopetrol presents to the Colombian National Council for Tax Benefits (Consejo Nacional de Beneficios Tributarios, or CNBT) its research, technology development projects and innovation initiatives, in order to obtain certifications for its science and technology investments. The CNBT certifies eligible science and technology investments, which are deductible from income tax upon execution; and Ecopetrol applies the tax benefit.

Our intangible assets are preserved through a technological value-generation process and an intellectual property protection process, which include the consolidation of trade secrets, patents, copyrights, trademarks, industrial designs, and publications in specialized journals. Ecopetrol has filed 266 patent applications in the last 15 years, 19 of them in 2020. Our most recent patent applications include innovative technologies, such as (i) a device for the coalescence of oil droplets dispersed in industrial wastewaters, (ii) synthesis and formulation of a nanofluid based on polymer-coated silica nanoparticles for the modification of relative permeability, (iii) a three dimensional superhydrophobic foam and its preparation method, and (iv) an online inspection tool for the efficient detection and classification of damages in transportation pipelines.

In 2020, the Colombian authorities granted us 8 new patents all in Colombia. We currently hold 101 patents in Colombia, the United States, Mexico, Russia, Peru, Venezuela, Ecuador, Brazil, Nigeria, Indonesia, India and Malaysia.

In 2020, Ecopetrol S.A. licensed 10 of its technologies to private companies for manufacturing, marketing commercialization and technical support including 5 to a North American company for tackling oil theft in pipelines.

We currently have 52 technologies licensed to Colombian and multi-national companies.

3.9 Applicable Laws and Regulations

3.9.1 Regulation of Exploration and Production Activities

3.9.1.1 Business Regulation

Pursuant to the Colombian Constitution, the Nation is the exclusive owner of minerals and non-renewable resources located in the subsoil and has full authority to determine the rights to be held and royalties or compensation to be paid by investors for the exploration or production of any hydrocarbon reserves. The Ministry of Mines and Energy and the ANH are the authorities responsible for regulating all activities related to the exploration and production of hydrocarbons in Colombia.

Decree Law 1056 of 1953 (the Petroleum Code, or *Código de Petróleos*) declares that the hydrocarbon industry and its activities of exploration, exploitation, refinement, transportation and distribution are of public interest, which means that, in the interest of the hydrocarbon industry, the Colombian government may order, for example, necessary expropriations in order to develop such industry. The hydrocarbon industry is under governmental supervision and control, regulated mainly by the Ministry of Mines and Energy and the ANH.

Ministry of Mines and Energy Resolution 181495 of 2009, as amended by Resolution 40048 of 2015, establishes a series of regulations regarding hydrocarbon exploration and production.

Ministry of Mines and Energy Resolution 180742 of 2012, partially repealed by Resolution 90341 of 2014, includes a series of technical regulations for unconventional hydrocarbon resources, including the procedures for advancing the exploration and exploitation of unconventional reserves. It also establishes the types of wells and their classification, as well as the fulfillment of those minimum (drilling and abandoning) conditions necessary to initiate or perform E&P activities. Furthermore, it contemplates the applicable procedure to resolve disputes between the mining sector and the oil and gas sector, regarding the coexistence of their rights in some specific projects.

Decree 3004 of 2013, issued by the Ministry of Mines and Energy, sets forth guidelines regarding future regulation related to the exploration and exploitation of unconventional hydrocarbon resources in Colombia. Under Decree 3004, an unconventional field is defined as a rock formation with low primary permeability that requires stimulation in order to improve the conditions of mobility and recovery of hydrocarbons. This regulation contains a series of guidelines regarding the regulation for unconventional hydrocarbon resources, including a definition of unconventional reservoirs and the term in which the Ministry of Mines and Energy has to issue the specific technical regulation regarding the exploration and exploitation of unconventional hydrocarbons and the proceedings that interested actors have to follow in order to seek the exploration and exploitation of unconventional hydrocarbons in Colombia. Resolution 90341 was issued on March 27, 2014 in development of the mandate of Decree 3004 setting the technical conditions, requirements and procedures for the exploration and exploitation of unconventional fields. Resolution 90341 of 2014 is currently suspended by order of the Council of State, as a precautionary measure in the analysis of a legal action filed by the Universidad del Norte. This precautionary measure covers both the Decree 3004 of December 26, 2013 and Resolution N° 90341 of March 27, 2014, related to unconventional fields.

On May 26, 2015, Decree 1073 compiled the majority of Colombian decrees in force regarding the administrative sector of mines and energy.

Decree Law 4137 of 2011, which modified the legal nature of the ANH regulates what corresponds to the integral administration of the hydrocarbon reserves and resources owned by the nation of Colombia.

In accordance with the aforementioned Decree Law, it is the responsibility of the Board of Directors of the ANH to define the criteria for administration and allocation of the areas; approve model contracts for their exploration and exploitation, while establishing the rules and criteria for their management and monitoring the contribution to the economic and social development of the country through the promotion and sustainable use of reserves and resources.

Agreement (*Acuerdo*, a type of regulation) 004 of 2012, as issued by the ANH, amends Agreement 008 of 2004 and sets forth the rules governing the award of exploration and production areas and the execution of contracts. As set forth below, Agreement 002 of 2017 replaces this *Acuerdo*.

Agreement 003 of 2014, as issued by the ANH, complements Agreement 004 of 2012 by setting forth the contractual framework for the carrying out of activities in unconventional reservoirs, the procurement regulations for the exploration and exploitation of unconventional fields and the procurement process for the awarding of hydrocarbon exploration and exploitation areas.

Agreement 002 of 2015, as issued by the ANH, partially amends Agreement 004 of 2012 and sets forth the initial rules and measures the Government can take to mitigate the adverse effects of the decline of international oil prices. The main measures established by this agreement are the following:

- i. The extension of terms and deadlines for the execution of activities related to investments in exploration and evaluation phases and for the declaration of commercial discoveries;
- ii. The establishment of procedures to transfer investments in exploration programs between allocated areas; and
- iii. The leveling of the contractual terms of offshore contracts entered before 2014 to the ones included in the contracts executed as a result of the 2014 Colombian Round.

Agreement 003 of 2015, as issued by the ANH, modifies and, also partially amends, Agreement 004 of 2012, and provides certain rules and measures the Government can take to mitigate the adverse effects of the decline of international oil prices. This agreement permits performance guarantees required under E&P contracts to be reduced in the same amount as the works actually performed during the term of the respective phase.

Agreement 004 of 2015, as issued by the ANH, also partially amends Agreement 004 of 2012, and provides certain rules and measures for the Government to mitigate the adverse effects of the decline of international oil prices. This agreement allows contractors to attribute additional activities carried out under a TEA to commitments under the first phase of an E&P contract.

Agreement 002 of 2017, as issued by the ANH on May 18, 2017, replaces Agreement 004 of 2012, Agreement 003 of 2014, and Agreements 002, 003, 004 and 005 of 2015. It establishes the general structure of the New Regulation for Administration and Assignment of Areas and the general guidelines regarding future hydrocarbon contracts in Colombia. Seeking the interests of the Nation, the market conditions, the national hydrocarbon sector strategy, the competitive context of producer countries and the Nation's social and environmental evolution.

Agreement 002 of 2017 adapts the existing regulations for the selection of contractors, and the applicable rules for the award, execution, termination, liquidation, monitoring, control and surveillance of the contracts signed with the ANH. In regard to unconventional reservoirs, this agreement also establishes the need to sign additional contracts and additional arrangements for the industry to exploit unconventional reservoirs in Colombia.

On November 8, 2018, the High Court for Administrative Matters (*Consejo de Estado*) analyzed the potential annulment of Decree 3004 of 2013 and Resolution 90341 of 2014 and issued an interim order to suspend their effects as of such date. However, the aforementioned Court established that, "... if the National Government is interested in investigation, clarifying and exploring the feasibility of the hydraulic fracturing procedure for the exploration and exploitation of hydrocarbons in unconventional reservoirs (YNC), it could advance in the PPII to identify the risks of unconventional activity."

On February 4, 2019, the ANH published the new model contract for offshore exploration and production. The purpose of this new model contract is to foster and stimulate investments in exploration and the exploitation of offshore hydrocarbons, enhancing Colombia's competitiveness to attract and retain investments from large and experienced O&G operators.

On February 5, 2019, the ANH by implementing the *Acuerdo No. 2* (Agreement No. 2) opened a Permanent Competitive Bidding Procedure (PPAA), which aims to select, among previously qualified proponents on equal terms, the most favorable offers to allocate the areas previously determined, demarcated and classified by the ANH. Several addendums have modified the terms of references of the PPAA, but, as to date, the applicable terms of reference of such bidding process are included in Addendum No. 19 of November 4, 2020.

The Agreement 02 of 2017 was partially modified by agreement 03 of February 18, 2019 to clarify the moment in which contractors may withdraw from the contracts signed with the ANH and also presents another alternative for those interested in the PPAA when they belong to business groups, other than the issuance of a parent company guarantee.

Resolution 078 of 2019, as issued by the ANH, approved the final terms of reference and the model of the onshore and offshore contract for the PPAA. Pursuant to this procedure, the ANH will select areas over which proposals may be received at any time, without the need of launching specific bidding procedures for their allocation.

As a result, in 2019, the ANH issued terms of references for the PPAA and carried out two cycles both of which were divided in the following four stages: (i) submission of the proposals and selection of the initial proponent, (ii) submission of counterproposals and selection of the most favorable counterproposal, (iii) the exercise of the right of option of improvement by the initial proponent and (iv) allocation of areas, contract awards and execution of contracts. In 2020 a third cycle was carried out by the ANH.

As result of the first cycle of the PPAA, the ANH awarded 11 onshore areas and 1 offshore area. As part of the second cycle, the ANH allocated 14 onshore blocks. Finally, as a result of the third cycle, the ANH awarded 4 onshore areas.

Agreement 01 of March 27, 2020 of the ANH regulates the transfer of activities or investments between legal instruments signed with the ANH to promote exploratory investment in the country and to seek the incorporation of new reserves, repealing the articles of Agreement 02 of 2017.

Agreement 02 of April 7, 2020 of the ANH regulates temporary measures to strengthen the hydrocarbon sector due to the effects generated by the fall in international oil prices. This agreement takes into account what is regulated by Decree 417 of 2020, where the Government declared the State of Economic, Social and Ecological Emergency throughout the national territory, and the declaration by the World Health Organization (WHO) of the outbreak of COVID-19 as a global pandemic. Among the legal measures enacted were: (i) the extension of terms and deadlines in the contracts signed with the ANH; (ii) exceptions to the requirements established in Agreement 01 of 2020 mentioned above, which considers the status of the international oil prices; (iii) possibility of allocating resources from the Benefit Programs to the Communities "PBC" to strengthen measures applied by the Government to face the crisis; and (iv) reduction of contractual guarantees, complying with the requirements established there.

Agreement 06 of September 11, 2020 of the ANH added Agreement 18 of 2004, Agreement 04 of 2005, Agreement 21 of 2006, and Agreement 2 of 2017 to incorporate into the Contracting Regulations for the Exploration and Exploitation of Hydrocarbons, the contractual elements that allow entities to carry out PPII on hydrocarbons in unconventional reservoirs (YNC) with the use of the *Multistage Hydraulic Fracturing with Horizontal Drilling* (FHPH) technique.

Through Resolution 0613 of September 14, 2020, the ANH opened a competitive process for the development of Research Projects in Unconventional Reservoirs by the use of the FHPH technique.

A first round was carried out between September 14, 2020 and November 25, 2020, allocating one area to Ecopetrol S.A. Therefore, by means of Resolution 0802 of November 25, 2020, the ANH awarded a Special Contract for Research Projects (CEPI) to Ecopetrol S.A. This contract will allow Ecopetrol, to execute activities in the interest of investigation, clarifying and exploring the feasibility of the hydraulic fracturing procedure for the exploration and exploitation of hydrocarbons in unconventional reservoirs in Colombia. The name of the contract is KALÉ and is located in Puerto Wilches (Department of Santander). As of the date of this annual report, the second round had commenced and was concluded in March 2021.

Temporary regulation for the Comprehensive Research Pilot Projects (PPII)

Ecopetrol has actively participated in the formulation of specific regulation for the implementation of the PPII. The regulatory framework includes:

- Resolution 40185 of 2020 of the Ministry of Mines and Energy. Technical regulations for the development of PPII.
- Resolution 0904 of 2020 of the Ministry of Interior and the Ministry of Mines and Energy. Social Guidelines for the development of PPII.
- Resolution 304 of 2020 of the Colombian Geological Service. Guidelines for the monitoring of seismicity and the inclusion of a seismic traffic light for the PPII.
- Agreement 006 of 2020 of the ANH. Regulations for the selection of contractors for CEPIs (Special Contract for Pilot Projects).

As of the date of this annual report, additional items of the PPII regulatory framework are being discussed with the Colombian Government pursuant to which we have made comments. In particular, the Colombian Government and the oil & gas industry are waiting for the final versions of the regulatory framework for pilot evaluation criteria, radioactive materials monitoring, health base lines and evaluation variables.

3.9.1.1.1 Environmental Licensing and Prior Consultation

Law 99 of 1993 and other environmental regulations, such as Decree 1076 of 2015 in particular (compilation decree regarding the administrative sector of environment and sustainable development), impose to companies, including oil and gas companies, the obligation to obtain an environmental license prior to undertaking any activity that may result in the serious deterioration of renewable natural resources, or that may have the capacity of materially modifying the physical environment.

The National Authority on Environmental Licensing (ANLA), created by means of Decree 3573 of 2011, is the authority responsible for evaluating the applications and issuing the environmental licenses for oil & gas-related activities, as well as surveilling and overseeing all hydrocarbon projects and monitoring the environmental compliance of such activity.

If the projects or activities could have a direct impact over the territories or the interests of indigenous, Afro-Colombian or Raizal communities, the Colombian Constitution provides that the companies developing such projects or activities must conduct the prior consultation process with those communities before initiating such projects or activities. This consultation process is a prerequisite for obtaining the required environmental licenses.

In addition, the Colombian Constitution and laws establish that, as part of the public participation mechanisms, Colombian individuals may request information regarding the activities of the project and their potential impacts. They may also request to undertake an environmental hearing so as to obtain information of the project subject to environmental licensing.

On May 26, 2015, the Ministry of Environment and Sustainable Development (MESD) issued Decree 1076, which compiles most of Colombian regulations in force regarding environment and sustainable development.

The environmental license encompasses all of the necessary permits, authorizations, concessions and other control instruments necessary under Colombian environmental law to undertake a project or activity that may result in the serious deterioration of renewable natural resources, or that have the capacity of materially modifying the physical environment. The license shall define specific conditions under which the beneficiary of the license may undertake such project or activity. The procedure to obtain an environmental license begins when the company files an Environmental Impact Study (EIA) related to the project before the ANLA. The licensing process includes an application for the use of natural renewable resources (water, soil and air), according to Decree 2106 of 2019. When the project or activity requires permits for the use of forestry species that are banned, these should be included in the environmental license process. The EIA must be filed as well as a plan to prevent, mitigate, correct and compensate for any activity that may harm the environment, known as the Environmental Management Plan (PMA).

The environmental licensing procedure in Colombia is set forth in Decree 1076 of 2015. According to the regulation currently in effect, the procedure to obtain an environmental license shall not take more than 90 business days. But, depending on the complexity of the information requested by the ANLA and administrative delays, including an oral hearing to determine the viability of the project, the procedure may take between 165 and 265 business days, depending on whether the applicant is required to file additional information. The actual procedure incorporates an oral hearing between the ANLA and the applicant in order to evaluate the information provided in the license application and whether it is necessary or not to request additional information about the proposed project. The ANLA will have no other opportunities to request additional information after this hearing.

The environmental licensing process for activities in unconventional reservoirs is that of Decree 1076 of 2015. However, the Ministry of Environment and Sustainable Development issued resolution 0821 of September 24, 2020, which established the terms of reference for the preparation of the Environmental Impact Study of the PP2, on unconventional hydrocarbon reservoirs using the FHPH technique.

The Ministry of Environment and Sustainable Development (MESD) is also responsible for issuing regulation and establishing climate change policies for different sectors in Colombia. The Ecopetrol Group comply with all applicable regulations. In particular, MESD is responsible for issuing regulation regarding Law 1931 of 2018 (Climate Change Law), which outlines provisions for the establishment of a National Program of Greenhouse Gas (GHG) Tradable Emission Quotas (PNCTE for its Spanish acronym). The PNCTE is expected to enter into force in 2022. The MESD is also responsible for the National Emission Reductions Registry (RENARE for its Spanish acronym), in which companies must register verified GHG emission reductions. RENARE is expected to start operating in 2021. As part of our continuous monitoring of climate change requirements, we also identified ongoing regulatory processes related to the reduction of fugitive emissions and routine flaring, led by the Ministry of Energy and Mines. A company that does not comply with the applicable environmental laws and regulations, does not execute the corresponding Environmental Management Plans (PMA) approved by the environmental authority or ignores the requirements imposed by an environmental license may be subject to an administrative sanction proceeding initiated either by the ANLA or the regional environmental authorities established by Law 1333 of 2009. The proceeding may result in oral or written warnings, monetary penalties, fines, license revocation or the temporary or permanent suspension of the activity being undertaken. Apart from administrative sanctions, the Colombian judiciary or other law enforcement authorities may also impose civil and even criminal sanctions if environmental damages are verified as a consequence of having breached the environmental laws and regulations applicable to the project.

3.9.1.1.2 Royalties

In Colombia, the Nation is the owner of minerals and non-renewable resources located in the subsurface, including hydrocarbons. Thus, companies engaged in exploration and production of hydrocarbons, such as Ecopetrol, must pay the National Hydrocarbons Agency, as representative of the Government of Colombia, a royalty on the production volume of each production field, as determined by the ANH.

Royalties may be paid in kind or in cash. Each production contract has its applicable royalty arrangement in accordance with applicable law. In 1999, a modification to the royalty regime established a sliding scale for royalty payments for crude oil and natural gas production fields discovered after July 29, 1999 and depending on the quality of the crude oil produced. Since 2002, as a result of the enactment of Law 756 of 2002, the royalty rate was fixed as a sliding scale depending on the produced volume from 8% for fields producing up to 5 mbd to 25% for fields producing in excess of 600 mbd. Notwithstanding the royalties for Incremental Production Contracts, Contracts for Undeveloped and Inactive Fields, and Incremental Production Projects defined in paragraph 3 Article 16 Law 756 of 2002, and Article 29 of the Law 1753 of 2015, the changes in the royalty regime only apply to new discoveries and do not apply to fields already in the production stage as of July 29, 1999. Producing fields pay royalties in accordance with the royalty law in force at the time of the discovery.

With the issuance of Law 2056 of 2020, ("Through which the organization and operation of the general system of royalties is regulated"), the royalties regime applicable to the hydrocarbon fields on which there have been made additional investments aimed at increasing the recovery factor of existing deposits was established. Article 18 of this law established that all the volumes produced in these fields will be considered incremental.

Regarding natural gas, in accordance with Resolution 877 of 2013, as amended by Resolution 640 of 2014, starting on January 1, 2014, the ANH has received royalties in cash rather than in kind. Thus, the producer may dispose of its gas production volumes corresponding to royalties paid in cash.

3.9.2 Regulation of Transportation Activities

Hydrocarbon transportation activity is a public interest activity in Colombia and a public service. As such, it is under governmental supervision and control, regulated mainly by the Ministry of Mines and Energy and the *Comisión de Regulación de Energía y Gas* (CREG as per its Spanish acronym).

Transportation and distribution of crude oil, liquefied petroleum gas and refined products must comply with the Petroleum Code, the Code of Commerce and all governmental decrees and resolutions. However, liquefied petroleum gas-related activities are regulated by CREG. According to Law 681 of 2001, multi-purpose pipelines owned by Cenit (a company wholly owned by Ecopetrol) must be open to third-party use on the basis of equal access to all.

Notwithstanding the general rules for hydrocarbon transportation in Colombia, Law 142 of 1994 defines the regulatory framework for the provision of public utility services, including the provision of natural gas. Moreover, natural gas transportation is subject to regulations specific to the natural gas industry as issued by CREG, due to the categorization of natural gas distribution as a public interest activity under Colombian laws.

Transportation systems, classified as crude oil pipelines and refined product pipelines, may be owned by private parties. Pipeline construction, operation and maintenance must comply with environmental, social, technical and economic requirements under national guidelines and international standards for the oil and gas industry.

Construction of transportation systems requires licenses and local permits awarded by the Ministry of Mines and Energy, the MESD and regional environmental authorities, respectively.

Crude oil transport

The regulatory framework relating to crude oil transportation accounts for both private use and public use pipelines. Private use pipelines are those built by the operating or refining entity for its own exclusive right and that of its affiliates. Public access pipelines are defined as pipelines built and operated by a public or private legal entity, for the purpose of publicly providing crude oil transportation services. The Colombian government, through the ANH, has a preferential right to use up to 20% of the total capacity of any public or private access pipeline to transport its crude oil royalties. However, for both private and public access pipelines, the ANH must pay the tariff for the pipeline use to transport its percentage of production.

The Ministry of Mines and Energy is responsible for reviewing and approving the design of and tracks for crude oil pipelines and establishing transport rates based on information provided by the service providers. It also oversees the calculation and payment of hydrocarbon transport-related taxes and manages the information system for the oil product distribution chain.

In 2014, the Ministry updated the transport regulation and the rate calculation method for this line of business. It introduced a framework for the secondary market and incentives for new pipeline construction and current pipeline capacity expansions. According to the Petroleum Code, rates must be revised every four years.

During the scheduled revision of 2019, the Ministry of Mines and Energy, by means of Resolutions 31123 and 31132 of 2019 established the applicable rules for transportation and oil production companies to negotiate tariffs for the next four years. Once the negotiation period was over, the Ministry of Mines and Energy through a series of resolutions set the applicable tariffs for transportation of crude oil through pipelines. Such resolutions, were in line with the tariff methodology that has been in place since 2014, providing more regulatory stability for the Midstream companies through June 2023.

In August 2020, the MME started a consulting process to carry out a study with the purpose of reviewing, adjusting, and updating the crude oil tariff setting methodology. The scope of the study requires the contractor to prepare a document proposing changes to the current methodology and analyze whether it would be possible to implement the proposed methodology once the current tariff period (2019-2023), determined by Resolution 72146 of 2014 has been finalized. The results of such study will be analyzed and discussed between all the stakeholders prior to the enforcement of any changes.

The Port Superintendence is the authority that oversees the port business for crude oil and refined products. Although this business is not highly regulated, market participants are required to report certain information to the Port Superintendence.

As a result of the enactment of Decree 119 of 2015, operators of private use hydrocarbon ports are currently able to provide hydrocarbon transport services to third parties pursuant to a mechanism established under that decree.

Decree 119 of 2015 was incorporated into Decree 1079 of 2015 issued by the Ministry of Transport, which compiles the majority of Colombian decrees and regulations in force regarding the administrative sector of transportation.

Refined products and liquefied petroleum gas transport

In 2014, CREG assumed responsibility for regulating product pipeline transportation from the Ministry of Mines and Energy, in addition to its pre-existing regulatory responsibility for liquefied petroleum gas, natural gas and electric energy transportation.

The applicable framework regarding LGP transportation was established by CREG Resolution 092 of 2009 (amended by Resolution 153 of 2014), which, among other issues, sets forth: (i) the obligation of the owners and operators of transportations infrastructure to guarantee access to their infrastructure to other market agents, as long as they pay the fees regulated by CREG; (ii) the general obligations applicable to LGP transporters; (iii) the requirements applicable to the LGP transportation agreement; and (iv) establishes the non-discrimination principle regarding the access to the national transportation infrastructure.

In January 2021, CREG presented a new draft resolution 232 of 2020, which establishes the Regulations for Transportation by multipurpose pipeline. The draft resolution was open to comments from the public and the oil and gas industry until February 26, 2021. The main objectives of the proposed regulation are: (i) to ensure free access to the transportation system without discrimination; (ii) offer optimal conditions in the operation and provision of the public transport service. In 2021, CREG also plans to define the methodology for calculating transportation rates for multipurpose pipelines.

In February 2021, CREG issued resolution 004 of 2021. Through this resolution CREG defined the Weighted Average Cost of Capital (WACC) methodology that will be applicable to the different activities that this entity regulates. The activities regulated by CREG include energy distribution and transmission, gas distribution and transportation and refined products transportation. The discount rate for transportation of refined products will be calculated in accordance with the inputs defined by the resolution and will be applicable once the tariff methodology for this activity is updated and published. As required by article 87 of Law 142 of 1994, regulatory agencies may modify the tariff methodologies every five (5) years. As of the date of this annual report, the tariff methodology had not yet been issued.

3.9.3 Regulation of Refining and Petrochemical Activities

Article 58 of the Petroleum Code establishes that oil refining activities can be developed throughout the Colombian territory and are not reserved to the State. However, Article 4 establishes that such activities are considered of public interest subject to governmental regulation, and the development of those activities must comply with technical requirements established by regulation.

In 2008, Law 1205, further developed by Resolution 180689 of 2010, issued by the Ministry of Mines and Energy, was issued with the main purpose of contributing to a cleaner environment. It established the minimum quality specifications for liquid fuels in Colombia. Since August 2010, Ecopetrol has been producing and selling diesel and gasoline that comply with the requirements of the aforementioned law.

Since 1995, under Resolution number 898 of August 23, 1995 the Ministries of Environment and Sustainable Development and of Mines and Energy, have regulated the environmental criteria for liquid and solid fuels used in commercial and industrial furnaces and boilers, as well as automobile internal combustion engines. Resolution 898 has been subject to numerous modifications through the years, the most recent by Resolution 40619 of June 30, 2017 as amended by Resolution 40575 of 2019, which extended the validity period. Ecopetrol has been complying with this regulation and working with governmental entities in order to improve air quality in the most critical areas in Colombia.

3.9.3.1 Regulation of Liquefied Petroleum Gas (LPG) and Liquid Fuels

Wholesale marketing, transport, distribution and retail marketing of LPG are mainly regulated by CREG Resolution 74 of 1996, and subsequent resolutions. LPG in Colombia is primarily obtained through Ecopetrol's refineries, field production and imports. The LPG must meet minimum quality standards to be marketed. Our marketing activities are regulated by CREG Resolution 53 of 2011 (as amended by CREG Resolutions 108 of 2011, 154 of 2014, 19 of 2015, 18, 34, 63, 64 of 2016 and 171 of 2017). The LPG price is regulated by CREG Resolutions 66 of 2007 (as amended by CREG Resolutions 59 of 2008, 002 of 2009, 123 of 2010, 95 of 2011, and 65 and 129 of 2016) as well as by CREG Resolution 80 of 2017 which sets forth that the price of LPG imported by Ecopetrol, which is meant to be marketed for the provision of public utilities, shall be the result of competitive procedures.

According to Article 4 and 212 of the Petroleum Code and Law 39 of 1987 (added by Law 26 of 1989 and as amended by Law 812 of 2003), the distribution of crude oil and its derivatives has a public purpose (*utilidad pública*), and the distribution of fuel oil and crude oil by-products is considered a public utility activity. Consequently, individuals or entities engaged in these activities are subject to regulations issued by the Colombian government. The Government has the power to determine quality standards, measurement and control of liquid fuels, and establish penalties that may apply to dealers who do not operate in compliance therewith.

The Ministry of Mines and Energy is the entity that controls and exercises technical supervision over the distribution of liquid fuels derived from petroleum, including the refining, import, storage, transportation and distribution in the country. Article 61 of Law 812 of 2003 (whose validity was extended by Law 1955 of 2019) identified the agents of the supply chain of petroleum-based liquid fuels. In this context, the Ministry of Mines and Energy through Resolution 40344 of 2017, published the required actions to ensure the LPG supply for the priority sectors in the country.

The distribution of liquid fuels, except LPG, is governed by Decree 1073 of 2015 (as amended), which establishes the requirements, obligations and penalties applicable to supply agents in the distribution, refining, import, storage, wholesale, transportation, retail sale and consumption of liquid fuels.

Decree 1073 of 2015 establishes the minimum technical requirements for the construction of storage plants and service stations. This Decree also regulates the distribution of liquid fuels, except LPG establishing the minimum requirements for distributors and the activities and types of agreements permitted for these agents. The Ministry of Mines and Energy also regulates the types of liquid fuels that can be sold and purchased and the penalties for noncompliance with governmental regulations.

Pursuant to Law 1430 of 2010, modified by Article 220 of Law 1819 of 2016, the distribution of fuels in areas near Colombian borders is the responsibility of the Ministry of Mines and Energy and is subject to specific regulations that impose strong control procedures and requirements. The Ministry of Mines and Energy establishes the safety standards for LPG, storage equipment, maintenance and distribution of LPG.

The Superintendence of Public Domestic Utilities also oversees the liquefied petroleum gas transportation business.

3.9.3.2 Regulation Concerning Production and Prices

According to the Decree - Law 4130 of 2011 and Decree 1260 of 2013, CREG is responsible for setting the prices of petroleum by-products throughout the entire chain of production and distribution, except for current gasoline engine, diesel and biofuels. On the other hand, by Decree 381 of 2012, as amended by Decree 1617 of 2013, and Decree 2881 of 2013, the Ministry of Mines and Energy is in charge of setting the methodology to determine the reference price of gasoline, diesel, biofuels and mixtures thereof.

Then, since May 2012, CREG sets the prices for most crude oil by-products, except for gasoline, diesel and biofuels. CREG determines the methodology to calculate their price while the Ministry of Mines and Energy sets the relevant prices in accordance with said methodology. The ANH does not intervene in the definition of prices of gasoline and diesel fuel. In addition, under Resolution 007 of 2017, CREG determined the basis for the methodology of compensation of terrestrial transportation of liquid fuel-oil, including current gasoline, diesel and biofuels between the storage plant and the fuel service station.

The methodology for calculating jet fuel prices is set out in Law 1450 of 2011, and jet fuel prices themselves are set by the Ministry of Mines and Energy.

The ANH determines the formula that is used to calculate royalty payments corresponding to the production of crude oil.

Decree 381 of 2012 and 1617 of 2013, as amended by Decree 2881 of 2013, as compiled in Decree 1073 of 2015, restructured the Ministry of Mines and Energy and gave it the responsibility to study industry problems and implement short and long-term refining planning policies. The Ministry is also responsible for establishing the governmental policies and goals to ensure the reliability, stability and continuity for the production of liquid fuels, biofuels and others.

Pursuant to Article 58 of the Petroleum Code, if there is a fuel shortage, any refining company operating in Colombia must offer to sell a portion or, if needed, the total of its production to supply local demand prior to exporting any production.

Fuel Price Stabilization Fund (FEPC)

The Fuel Price Stabilization Fund was created by Law 1151 of 2007. It is a fund assigned and administered by the Ministry of Finance and Public Credit. Its function is to attenuate, in the domestic market, the impact of fluctuations on fuel prices in international markets.

According to Article 2.3.4.1.3 of Decree 1068 of 2015, amended by Decree 1451 of 2018, the resources for the functioning of the FEPC come from the following sources: (a) financial returns of resources of the Fund; (b) extraordinary credit resources received from the National Treasury; (c) funds allocated to the FEPC in the national general budget; (d) fuel taxes and; (e) bonds or other public debt securities issued by the Nation in favor of the FEPC, in order to cover the obligations of the Fund.

The operation of the FEPC is governed by Decree 1068 of 2015, amended by Decree 1451 of 2018, Chapter 1, and Title 4 (compilation decree regarding treasury public sector). First, refiners and/or importers of regular gasoline and diesel must report to the Ministry of Mines and Energy the volume of regular gasoline and diesel sold in the previous month and such reports must be made within the next 35 calendar days of each month.

The report must also contain, among other matters: information corresponding to each fuel disaggregated daily; the discrimination of the volumes sold, and the origin national or imported of the gasoline and diesel sold. If the regular gasoline or the diesel is of national origin, the refiner/importer must inform from which refinery they come. Secondly, the Ministry of Mines and Energy calculates and liquidates, by resolution, the net position of each refiner/importer and each fuel to be stabilized by the FEPC.

Decree 1068 of 2015, amended by Decree 1451 of 2018, provides that the FEPC will pay in Colombian pesos the value corresponding to the calculation and settlement of the Net Position of each refiner and/or importer within the term defined by the Ministry of Mines and Energy and based on availability of FEPC resources.

Law 1819 of 2016 as amended created a tax, related contribution to finance the FEPC. This contribution is caused when the sum of the Differentials of Participation (difference between the Producer Income and the International Parity Price, when the first is greater than the second on the date of issuance of the sales invoice, multiplied by the volume of fuel sold) is greater than the sum of the Differentials of Compensation (the difference presented between the Producer Income and the International Parity Price, when the second is greater than the first on the date of issuance of the sales invoice, multiplied by the volume of fuel sold).

The event that generates the contribution is the sale in Colombia of gasoline or diesel by the refiners and/or importers to the wholesale distributor of fuels, according to the price set by the Ministry of Mines and Energy, however, if the importer is at the same time a wholesale distributor, the triggering event shall be the withdrawal of the product to be sold. The taxpayer responsible for the contribution is the refiner and/or importer and the active subject is the Nation. The tax base corresponds to the positive difference between the sum of the Differentials of Participation and the sum of the Differentials of Compensation.

The Ministry of Mines and Energy calculates the contribution through the liquidation of the Net Position of each refiner or importer with respect to the FEPC based on the report that the refiners and/or importers submit. If the sum of the Differentials of Participation is greater than the sum of the Differentials of Compensation and the contribution is caused, the Ministry of Mines and Energy will order the refiner or the importer to pay the contribution to the National Treasury within the 30 days following the execution of the liquidation resolution.

Subsequently, Law 1837 of 2017 (Article 16) provided that the remaining resources that were in the Ecopetrol's accounts as of December 2014, as a result of the collection of the Differential Contribution from the FEPC, would be transferred to the General Direction of Public Credit and Treasury of the Ministry of Finance and Public Credit (*DGCPTN for its Spanish acronym*). Law 1955 of 2019 (Article 33) authorizes the Ministry of Finance and Public Credit to enter into hedging agreements and establishes the conditions thereof, for purposes of guaranteeing the sustainability and the functioning of the FEPC.

The Ministry of Mines and Energy issued Resolution 31435 of 2020, which contains the settlement of our Net Positions corresponding to: (i) the fourth quarter of 2019 and (ii) the first and the second quarter of 2020. In this Resolution, Ecopetrol was ordered to transfer COP\$50,131,065,625.67 to the DGCPTN. Also, by means of Resolution 31434 and for the same periods, the Ministry ordered Refinería de Cartagena S.A.S. to transfer COP157,942,973,442.41 to the DGCPTN.

Law 1955 of 2019 authorizes the Ministry of Finance, as administrator of the FEPC, to carry out, directly or indirectly, the design, management, acquisition and/or execution of hedges on the Ministry of Finance's direct exposure to (i) crude oil liquid fuel oils prices in the international market or (ii) the exchange rate of the Colombian Peso. This law also authorizes the Ministry of Finance to set stabilization mechanisms of the reference recommended retail prices of regulated fuel oil, as well as the subsidies to such regulated fuel oils to be executed through the FEPC.

3.9.3.3 Regulation of Biofuel and Related Activities

The sale and distribution of biofuels is regulated by the Ministry of Mines and Energy. Regulations establish the quality and pricing standards for biofuels and impose minimum requirements for mixing ethanol with gasoline and biodiesel with diesel.

The sale and distribution of biofuels is provided under CREG Resolution 240 of 2016, which particularly regulates: a) the sorts of market that will be served with biogas and biomethane; b) the quality and safety conditions; and c) the tariff regime. Pursuant to Article 4 of the foregoing Resolution, biogas supply through isolated networks to serve non-regulated users and natural gas vehicles (GNV as per its Spanish acronym), shall be incorporated as a public utility company. Furthermore, Article 5 provides that biomethane supply through isolated networks or interconnected networks to the National Transportation System shall also be incorporated as a public utility company. Finally, Article 12 states that biogas suppliers may develop the production, transportation, distribution and commercialization activities through integrated structures, provided that they keep separate accounts for each activity and grant free access to the networks to both regulated and non-regulated users. To the same extent, production, distribution and commercialization of biomethane through interconnected networks to the National Transportation System may be developed through integrated structures, as long as the supplier keeps separate accounts for each activity and grants free access to the networks to both regulated and non-regulated users.

3.9.4 Regulation of the Natural Gas Market

Decree 1073 of 2015, Part 2, Title 2, Chapter 2, established that all producers have to issue a production statement that includes the volumes of natural gas available for sale for a period of ten years. This decree established the regime for the selling and marketing of natural gas in Colombia, including specific procedures that regulate the Colombian market in order to manage the remaining natural gas reserves owned by the Nation, and to protect domestic consumers, especially residential consumers, by prioritizing delivery of gas to residential consumers, regulating the export of natural gas and setting forth the export restrictions applicable during an internal shortage of natural gas.

Currently in Colombia the price of natural gas is determined by the market, but some agreements still have to conform to the regulated formula. CREG issued Resolutions 185 (for transportation) and 186 (for supply) of 2020, which jointly replace Resolution 114 of 2017 and its amendments, related to commercial aspects of the wholesale natural gas market in Colombia. However, pursuant to Decree 1073 of 2015, such procedures do not apply to the following activities: a) natural gas exports; b) natural gas as raw material in petrochemical production; c) natural gas commercialization from minor fields (production capacity under 30 million SCFD); d) natural gas commercialization from hydrocarbon fields under testing phase or which have not yet been declared commercially viable; e) natural gas commercialization from unconventional reservoirs; and f) internal consumption from natural gas producers.

CREG determines which agents can participate in the primary and secondary markets. Ecopetrol is authorized to participate as a seller in the primary market as a natural gas producer and as a buyer in the secondary market when Ecopetrol requires natural gas from other producers for its own needs. CREG regulations provide that a natural gas producer cannot participate as a merchant of natural gas in the secondary market, except that it may purchase gas to meet its existing contractual obligations. Ecopetrol is also able to resell available natural gas transportation capacity into the secondary market as a non-regulated consumer.

Priority for the Supply of Natural Gas

The export of natural gas, in contrast, is not considered a public utility activity under Colombian law and therefore is not subject to Law 142 of 1994. Nevertheless, the domestic supply of natural gas is a priority for the Colombian government and is considered to be a public utility complementary activity, and therefore public utility regulations apply to the internal supply of natural gas.

Decree 1073 of 2015 (amended by Decree 2345 of 2015) provides that in the event the supply of natural gas is reduced or halted as a result of a shortage, the Colombian government has the right to suspend the supply of natural gas for export. If such export contracts are suspended by the Colombian government, the export agents are entitled to receive compensation in accordance to Article 2.2.2.2.15 and 2.2.2.2.38 of Decree 1073, 2015. Notwithstanding the foregoing, Decree 1073 of 2015 establishes freedom to export natural gas under normal gas-reserve conditions. Producers of natural gas may enter into natural gas export contracts if the ratio of proved reserves to consumption exceeds seven years, as determined by the Colombian Energy Planning Authority (or UPME for its Spanish acronym).

Decree 1073 of 2015 (amended by Decree 2345 of 2015) establishes an order of supply when restrictions are placed on the supply of natural gas or serious emergency situations arise that preclude the continued provision of certain services, as follows: (i) essential demand, as established in Decree 1073 of 2015, (ii) non-essential demand under an existing agreement with a warranty of uninterrupted provision and (iii) firm exports delivery.

The order of priority for the supply of natural gas is as follows: (i) the operation of the compressor stations of the National Transportation System, (ii) residential users and small business users engaged in the distribution network, (iii) vehicular compressed natural gas and (iv) gas refineries, excluding those destined for self-generation of electricity that can be replaced with energy from National Transportation System, which has first priority. The Ministry of Mines and Energy also establishes distribution priorities in the event of a natural gas shortfall derived from supply or infrastructure issues. This order of priority is based on the type of contract, with firm supply contracts having priority over interruptible supply contracts.

Decree 1073 of 2015 and CREG Resolution 186 of 2020: (i) provide specific procedures and forms of supply agreements determined by CREG pursuant to which an agent may sell and buy natural gas in the Colombian primary and secondary market produced from large fields (capacity of more than 30 million CFPD); and (ii) permit the sale of natural gas from small fields (capacity under 30 million CFPD) pursuant to contracts that fulfill certain regulatory requirements but whose form is not prescribed by law.

3.9.5 Regulation of the Electric Energy Commercialization Activity

As determined by article 11 of Law 143 of 1994, commercialization activities, which are developed by commercialization agents, consist of the purchase of electricity in the electric energy market ("MEM", for its Spanish acronym) and the subsequent resale to other participants of the wholesale such as commercialization agents, generation agents, or to end-customers, both regulated and non-regulated. Ecopetrol Energía S.A.S E.S.P., one subsidiary of Ecopetrol, is registered as a commercialization agent before the manager of the commercial exchanges systems and performs commercialization activities within the MEM.

Commercialization activity is regulated by CREG Resolution 156 of 2011, which establishes the regulations and the rights and duties of the agents. The main income of commercialization agents comes from the variable and fixed components of the unit cost tariff formula described in CREG Resolution 119 of 2007, as modified by CREG Resolutions 191 of 2014 and 030 of 2018. The variable component considers:

- the costs of commercialization services, as determined by article 12 of CREG Resolution 180 of 2014,
- the amount that these agents must pay to the manager of the commercial exchanges system, calculated by ASIC based on the mathematic methodology set forth by CREG Resolution 174 of 2013 (as modified by CREG Resolutions 175 of 2016 and 100 of 2015) and which is paid monthly,
- the amount that these agents must pay to the Public Utilities Superintendence and to CREG, which is defined every year by CREG following the rules set in article 85 of Law 142 of 1994. These payments must be made each year, and
- the cost of the guarantees that the agent must provide to participate in the MEM by following the rules of CREG Resolution 024 of 1995 (as modified by CREG Resolutions 116 of 1998, 019 of 2006 and 184 of 2015).

Regarding the markets that commercialization agents attend, Law 143 of 1994 divides the market into two segments: regulated market ("Regulated Market") and the non-regulated market ("Non-Regulated Market").

The Non-Regulated Market is comprised of electricity consumers that either have a peak demand greater than 0.10 MW or a minimum monthly consumption greater than 55.0 MWh. This segment is attended by generation and commercialization companies. Purchases of electricity in this segment can be freely agreed among participants at freely negotiated prices for the commercialization and generation components of the tariff's unitary price.

Resolution CREG 015 of 2018 establishes the obligations for Network Operators (owner of the physical networks) and commercialization agents for the transportation and distribution of energy and also regulates the quality standards for the delivery of energy at the point of consumption, and the applicable methodology for calculating the distribution charges of each Network Operator.

As determined by article 74 of Law 143 of 1994, as modified by article 298 of Law 1955 of 2019, any public utilities company that makes part of the National Interconnected System (“SIN” for its Spanish acronym) can perform the generation, (which consists of the production of electricity through any generation plant connected to the SIN, activity performed by generation agents, who participate in the MEM by selling electric energy to other generation and commercialization agents, or to Non-Regulated Users), distribution (which consists of transporting and delivering electric energy to end users through the Regional Transmission Systems (*STR for its Spanish acronym*), and the Local Distribution Systems (*SDL for its Spanish acronym*) deploying tension levels under 220 kV; agents in charge of providing the distribution public utility are called Distribution Agents or Grid Operators (*OR for its Spanish acronym*) and commercialization activities in an integrated manner.

This provision also applies to companies having the same controlling party or between those where there is a situation of control, which encompasses the real beneficiary rationale applicable under Colombian electric energy regulation (for reference see article 74 of 1994, as amended by Law 1955 of 2019). A situation of control is defined by article 260 of the Code of Commerce. On the other hand, transmission companies are prevented by law from holding market shares in generation, commercialization, or distribution companies (see CREG Resolution 001 of 2006).

In relation with transmission, (which comprises the transportation of electrical energy in the STN deploying tension levels of 220 kV or higher, guaranteeing the required quality standards and the availability of the transmission assets; the owners of the transmission assets must ensure free access to the transmission networks to the users and to generation agents) companies carrying out this activity are not able to develop commercialization, distribution or generation activities. However, commercialization, distribution and generation companies are allowed to hold shares, quotas or participation of corporate interest in the capital of transmission companies, as long as they represent no more than 15% of the company’s capital. Please note that, in this case, neither the transmission company nor the other companies may have a control situation over the other.

Exceptionally, commercialization, distribution and generation companies may own more than 15% of a transmission company if the income of the transmission company does not represent more than 2% of the total transmission income from the SIN. If the company engaged in the transmission activity, with a cut-off date of December 31 of each year, exceeds this limit, the commercialization, generation or distribution company who has shares, quotas or interest shares in the capital of the company must sell, within six months following the occurrence of this fact, the shares, quotas or interest shares that exceed 15% of the capital stock of the transmission company. This, unless within the same period, the transmission company sells the assets that makes it exceed the 2% limit of the total income.

The rules set forth by CREG Resolution 095 of 2007 Article 2 are applicable to Ecopetrol and, as of the date of this annual report, we are in compliance with all such requirements.

3.9.6 Regulation of the Electricity Self-Generation Activity

Law 1715 of 2014 regulates the integration of non-conventional renewable energies to the National Interconnected System. Among other aspects, this law obliges the Colombian Government and the CREG to develop the regulatory framework for the promotion of the electricity self-generating activity from non-conventional renewable energy sources, and the sale of self-generation surpluses.

Based on Law 1715 of 2014, Decree 2469 of 2014, as currently compiled by Section 4 of Decree 1073 of 2015, established energy policy guidelines regarding the delivery of self-generation surpluses through the SIN. In addition, this decree sets forth the parameters for a person to be considered as an electricity self-generator. Specifically, it states that in order to be considered a self-generator a person must (a) receive electricity for its consumption without it being necessary to use assets of the SIN, (b) the electricity surpluses may be higher in any measure, and without any regulatory limit or restrictions, than the value of its own consumption, (c) for the delivery of surpluses to the SIN it will be necessary for the self-generator to submit itself to the regulation of the CREG, case in which large-scale self-generators must be represented before the wholesale energy market, and (d) the generation assets may be owned by the self-generator and may be owned and operated by third parties.

Decree 348 of 2017, as currently compiled by Section 4A of Decree 1073 of 2015, establishes public policy guidelines on efficient energy management and delivery of small-scale electricity self-generation surpluses. In addition, this regulation establishes the conditions for the connection of small-scale self-generators (*AGPE* for its Spanish acronym) to the SIN, the parameters to be an AGPE, the reporting of surpluses to the Mining and Energy Planning Unit (“UPME”) and the remuneration of surplus energy. Note that, as determined by Resolution UPME 281 of 2018, the maximum electricity generation limit to be considered an AGPE is one (1) MW and will correspond to the installed capacity of the self-generator’s generation system. Above that limit, an electricity self-generator will be considered a big-scale electricity self-generator (“AGGE” as per its acronym in Spanish).

The specific regulation for AGGE is currently determined by CREG Resolution 024 of 2015, whereas the specific regulation for AGPE is currently set by CREG Resolution 030 of 2018.

CREG Resolution 024 of 2015 (modified by CREG Resolution 140 of 2017) sets conditions for surplus sales of an AGGE, connection and metering conditions, and back-up and energy supply conditions. Specifically, this resolution determines that AGGE must follow the general connection rules to the SIN for a generation plant, that they must have a remote telemetry system, and that they must have a back-up power purchase agreement, among others.

CREG Resolution 030 of 2018 establishes the connection conditions for AGPE, surplus sales conditions, metering conditions and energy commercialization rules for AGPE. Note that CREG published CREG Resolution 002 of 2021, by means of which it published a project resolution in which it modifies the regulation for AGPE regarding the connection measurement, and surplus trade rules.

The Ecopetrol Group has invested in several projects that are considered projects from AGGE, which means that CREG Resolution 024 of 2015 is the main regulation that applies to Ecopetrol’s self-generation projects. As of the date of this annual report, Ecopetrol complies with all regulations, as set forth in the above-mentioned resolution and Decree 2469 of 2014 regarding the delivering of electricity surpluses to the SIN and to its subsidiaries or controlled parties.

3.10 Technology, Environment, Social and Governance (TESG) Strategies and Initiatives

Ecopetrol has a long-standing commitment to positively contribute in terms of economic, social, and environmental development, and grounds its behavior on a solid corporate governance, a business conduct based on values and ethical principles, with transparency at its core. This work has been led in collaboration with our stakeholders through initiatives and strategies that have been framed in corporate responsibility and sustainability. The Company has strengthened its metrics and reporting of environmental, social and governance (ESG) issues in line with international standards.

Furthermore, Ecopetrol has identified that Technology (T), leveraged on applied innovation and the revolution brought about by digital transformation, is a key catalyst to accelerate and achieve in a timely manner the necessary changes to face ESG challenges. This is the new concept of TESG. The convergence between TESG and Ecopetrol’s corporate strategy marks a milestone that will change the future of the Company, where its transformation into an energy company is leveraged by technology. With this, we validate our commitment to be a Company that moves towards value creation in a sustainable future.

During 2020, Ecopetrol reviewed its environmental, social and governance (ESG) taxonomy, considering shifts in international trends related to these. One of the main findings of the project was that sustainability needs to be addressed from a technology standpoint that allows for the implementation of innovative solutions to current and future challenges in an accelerated and exponential way. The TESG strategy integrates technology to environmental, social, economic and governance issues, allowing for innovative solutions to have accelerated implementations and timely scalability, and is one of the four lines of action of our energy transition plan (See the section entitled Strategy and Market Overview—Our Corporate Strategy—2021 – 2023 Business Plan—Energy Transition).

This strategy is based on a materiality analysis, which allowed the identification of 28 TSEG topics that have or could have a significant impact (positive or negative) on our ability to generate value in the short, medium and long term and/or a significant relevance to stakeholders. Based on this analysis, Ecopetrol identified materiality as a dynamic and recurring process that is expected to be constantly reviewed. Moreover, although Ecopetrol manages all 28 TSEG topics using four distinct categories (exceptional, outstanding, differentiated and compliance), in its disclosures, Ecopetrol will prioritize the following, based on their materiality:

Ecopetrol's Material Topics

- | | |
|---|---|
| <ul style="list-style-type: none">• Climate Change• Water Management• Regional Development• Health and Safety• Biodiversity and Ecosystem Services• Talent attraction, development and retention | <ul style="list-style-type: none">• Circular Economy• Air Quality• Fuel Quality• Use of energy and alternative sources• Prevention and management of incidents by operations• Prevention and management of incidents caused by third parties |
|---|---|

During 2020, we reviewed and updated our seven stakeholder groups (as defined below), given that their expectations and perceptions are considered within the materiality analysis. The methodology used for this update was based on the application of the AA1000 standard. Its purpose is to responsibly manage relationships with our key stakeholders, which leverages decision-making and strategic vision, resulting in long-term value creation.

Ecopetrol's seven key stakeholder Groups are: (i) associates and partners, (ii) investors, (iii) clients, (iv) suppliers, contractors and their employees, (v) employees, retirees and their beneficiaries, (vi) state, and (vii) society and community.

As in previous years, during 2020 the Corporate Responsibility Area consulted the perceptions and expectations of our seven stakeholder groups with respect to the 28 TSEG topics and corporate responsibility attributes. The results obtained for corporate responsibility in 2020 (84%) represent an improvement of 2% over the results obtained in 2019 (82%).

We also remain committed to improving our information disclosure standards by following international best practices. In particular, during 2020, and early 2021, the Company decided to begin the adoption of the Sustainability Accounting Standards Board (SASB), the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD), and the Stakeholder Capitalism Metrics (SCM) into our stakeholders' reports.

During 2020, the environmental management strategy of Ecopetrol S.A. included the following components:

- i. **Environmental Viability:** this strategy concentrates on the planning, execution and submission of environmental impact assessments to national and regional authorities in order to obtain licenses and permits for project execution. Adequate project planning allows projects to pursue impact prevention and minimization through the mitigation hierarchy approach, ensuring the sustainability of operations and systematic relationships with stakeholders.
- ii. **Climate Change:** this strategy aims to decrease our carbon emissions and manage climate-related risks and opportunities, through the implementation of four strategic action lines:
 - Mitigation:** reducing our greenhouse gas emissions (GHG) and creating carbon offset alternatives as part of a comprehensive decarbonization plan;
 - Vulnerability and Adaptation:** reducing the risks and impacts to our operations posed by climate variability and change;

Research and Technology: investing on research and development to reduce our GHG emissions through low carbon technologies; and

Involvement in Policymaking: advising and influencing government policies on climate change.

Our decarbonization plan has four components: (i) GHG emissions inventory verification, (ii) development and implementation of an emissions reduction portfolio, (iii) design and implementation of an offset portfolio of natural climate solutions, and (iv) development of a net zero emissions roadmap.

As part of Ecopetrol S.A.'s efforts to contribute to the Sustainable Development Goals and the Paris Agreement, on March 25, 2021, Ecopetrol announced its plan to achieve net zero carbon emissions by 2050 (scopes 1 & 2), in line with its commitment to mitigate climate change and further the energy transition and the TESG agenda.

By 2030, Ecopetrol seeks to reduce its CO₂e emissions by 25% as compared to the 2019 baseline for scopes 1 and 2, which correspond to direct and indirect emissions associated with the purchase of energy. In addition, Ecopetrol will seek to reduce 50% of its total emissions (scopes 1, 2 and 3) associated with the company's value chain, which includes the use of its products, by 2050. However, we cannot offer any assurance on our ability to meet these goals by such dates.

The development of the goals proposed are a part of the Ecopetrol Group's Corporate Strategy and energy transition roadmap. Progress on these goals is expected to be reported periodically in line with Company's earnings results.

Ecopetrol continues to implement its emissions reduction portfolio, which includes specific programs and targets in relation to renewable energies, elimination of routine flaring, energy efficiency and reduction of fugitive emissions and venting. In 2020, we achieved a reduction of 199,847 tons of CO₂e from projects implemented during that year. Ecopetrol has achieved a total accumulated reduction of 8,472,766 tons of CO₂e during the 2010-2020 period, of which 1,756,163 tons of CO₂e have already been verified by a third party.

iii. **Sustainable production system and biodiversity:** Ecopetrol's biodiversity strategy is based on two components: i) prevention and mitigation of biodiversity impacts and ii) implementation of nature-based solutions, to offset residual impacts and actively respond to challenges related to climate change, water resources and biodiversity management, food security or disaster risks, among others. Each of these themes are described below.

i. Prevention and mitigation of biodiversity impacts:

- Updated biodiversity information for decision making and resilience analysis.
- Incorporate the impact of the mitigation hierarchy in the planning and implementation of projects and operations.

ii. Implementation of nature-based solutions:

- Large scale interventions in priority areas to capture GHG emissions and generate additional biodiversity and social co-benefits.
- Conserving biodiversity and ecosystem services

- iv. **Circular Economy:** the circular economy model of Ecopetrol was structured in alignment with the National Circular Economy Strategy declared by the Ministry of Environment and Sustainable Development in 2019. This strategy defined the concept of circular economy as “production and consumption systems that promote efficiency in the use of materials, water and energy, taking into account ecosystem resilience, circular use of material flows through implementation of technological innovation, partnerships and collaborations between actors, and promotion of business models that respond to the fundamentals of sustainable development.”

In this sense, the main goal of the circular economy model is to incorporate the concept into management processes in order to promote economic growth, improve competitiveness, and mitigate risks related to environment and price volatility in raw materials. The model’s five components are (i) efficient use of resources and new businesses, (ii) improvement and development of products and services, (iii) standards and public policy, (iv) territory management towards circularity, and (v) corporate culture.

The circular initiatives portfolio includes 333 initiatives: out of which 230 are being developed directly by Ecopetrol S.A., 97 by the Ecopetrol Group, and 6 by industrial symbiosis

- v. **Water Management:** this strategy aims to incorporate water management efficiency into the organization’s value chain, as a key element in project decision-making. Based on a sustainability framework, we aim to reduce environmental impacts and water-related conflicts, as well as incorporate water security stewardship initiatives in accordance with the following areas: (i) operational efficiency in water management; (ii) sustainability and water security in the environment; and (iii) water planning and governance. This strategy is aligned with the 2010 National Water Resources Policy, the 2018-2022 National Development Plan, the Green Growth Mission and the UN 2030 Sustainable Development Goals.

Ecopetrol is also committed to improving the quality of the fuels it supplies in order to contribute to a better air quality for Colombians and comply with fuel quality regulations. Taking advantage of being an integrated company, after April 2018, we reduced the sulphur content in our diesel B2 (98% fossil and 2% biodiesel) to under 25 ppm. In particular, in 2020, the diesel and the gasoline that we distributed in Colombia had an average of 9.9 ppm and 84.9 ppm of Sulphur, respectively, below the current local regulations of 50 ppm in diesel and 300 ppm in gasoline.

Further information can be found in Ecopetrol’s 2020 Sustainability Report which is available on our website at: www.ecopetrol.com.co.

3.10.2 Energy Initiatives

Ecopetrol has been undertaking significant efforts to make efficient and rational use of energy resources in its production processes and to reduce energy consumption, costs and carbon dioxide emissions. We focus on efficiency, reliability, optimization and energy diversification.

Production

Further, during 2020, Ecopetrol’s production segment had an average monthly energy consumption of 402 GWhm (gigawatts per hour per month) for its direct operation, from which 66% was provided through self-generation and the remaining 34% with non-regulated energy purchased from the National Transmission System.

Transport

In January 2021, Ecopetrol started the construction of a second solar complex, San Fernando, in order to supply renewable energy to its transport and production operations. This second solar farm will have an installed capacity of 59 MW, which will add up, along with the current capacity of the Castilla Solar Farm (21 MW), a total capacity of 80 MW of solar generation in the Castillas’ solar farm. The San Fernando solar farm will supply part of the energy required by the San Fernando transport station and the Castilla field.

In 2021, the Ecopetrol Group will begin the development of six new photovoltaic projects for 45 MW that are expected to boost Colombia’s energy transition and that will be added to the San Fernando and Castilla solar farms.

In terms of wind generation, we have identified prospects on the Atlantic Coast and Huila. Furthermore, the wind measurement activity was awarded in the Casablanca lot adjacent to the Cartagena Refinery, which began in January 2021.

Refining

During 2020, the Barrancabermeja refinery's average monthly energy consumption was 53 GWhm (gigawatts per hour per month), provided through self-generation. The Cartagena Refinery's average monthly energy consumption was 58 GWhm (gigawatts per hour per month), provided through self-generation.

3.10.3 HSE

This section describes the health, safety and environmental (HSE) practices of Ecopetrol S.A. Subsidiaries guidelines must be consistent with those established by Ecopetrol S.A.

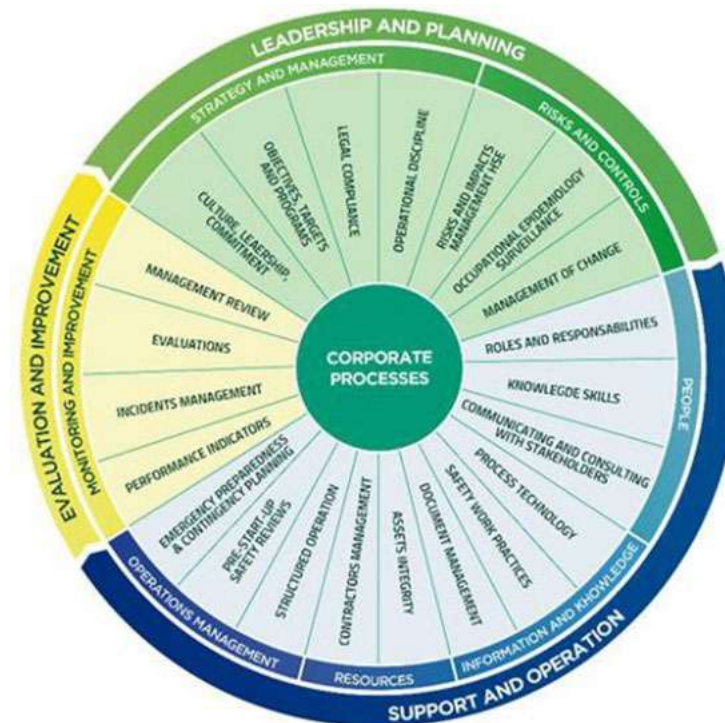
3.10.3.1 Ecopetrol S.A.

One of the principles that guides Ecopetrol is the commitment to its employees and the development of the communities in which we operate. For that reason, Ecopetrol S.A. is devoted to improving our health, safety and environmental (HSE) practices.

The results of the HSE performance in 2020, compared with the prior year, were:

- A reduction in the Total Recordable Incidents Frequency (TRIF) from 0.59 in 2019 to 0.43 in 2020. The TRIF represents the number of employee or contractor injuries that require minimum medical treatment for every million hours worked, including fatalities
- A 67% decrease in road accidents, due to improvements in real-time monitoring of drivers' safety habits, an increase in control check points for tracking tankers and awareness campaigns for drivers
- An improvement in reporting minor oil spills and identifying their causes, due to a better asset integrity and maintenance programs monitoring
- 5 process safety incidents in 2020, from 4 incidents in 2019;
- A 38% decrease in the number of incidents involving employee or contractor injuries that require medical treatment, restricted work or lost days
- The severity of occupational incidents remained constant in 2020 compared to 2019 with three fatalities recorded in both years; and
- A decrease of 12% in the amount of oil spilled. In 2020, 125 barrels were spilled as compared to 142 barrels in 2019.

We have several programs in place aimed at increasing the safety of our industrial processes and minimizing the number of occupational accidents and other major incidents. Our HSE management model is based on key focus areas that are aligned with our integrated management system.

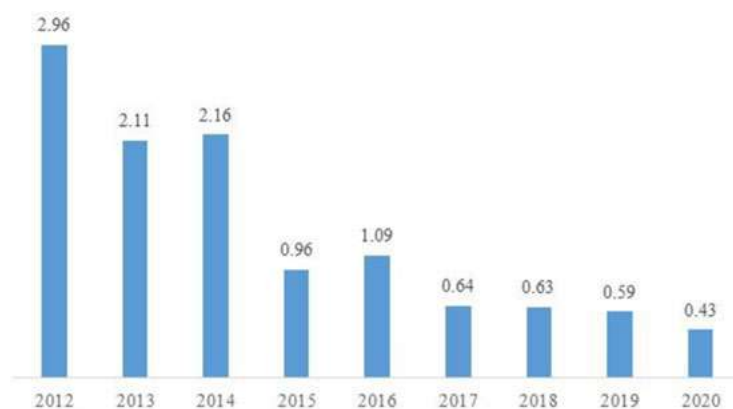


Total Recordable Incidents Frequency – Employees and Contractors

Ecopetrol S.A. places an important emphasis on understanding, monitoring and controlling the impacts on workers and contractors.

TRIF has improved from 2.96 incidents per million hours worked in 2012 to 0.43 in 2020. In 2020, 46 recordable cases occurred, where 15% led to restricted work, 9% required medical treatment and 76% led to lost days. Additionally, we had a 38% decrease in the number of occupational incidents compared to 2019, however, with decreased work hours in 2020.

Graph 7 – Total Recordable Incident Frequency – Employees and Contractors (*) ()**



* Number of employee or contractor injuries requiring minimum medical treatment for every million hours worked.

** Includes data for Ecopetrol S.A. and the Vice-Presidency of Transport and Logistics, but does not include data for subsidiaries of Ecopetrol.

Contingency Plans and Environmental Remediation

In order to protect and minimize damage to people, the environment, and assets, Ecopetrol's operational areas have documented, updated, disclosed and trained emergency and contingency plans to guarantee immediate, timely and effective intervention in the event of emergencies and disasters that may occur in our facilities and operations.

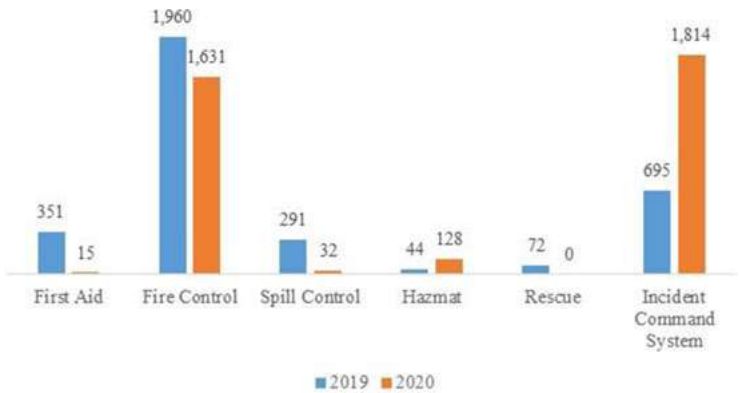
Emergency and contingency response plans are prepared in accordance with Colombian legal requirements and considering internal emergency guidelines. These plans, which have the approval of the National Authority for Environmental Licenses (ANLA), are part of the risk management procedures of the territories where we operate.

The emergency and contingency plans, which have been developed from a risk and consequence analysis, cover the preparedness, response and recovery phases and include the following elements:

- Identification of emergency and disaster scenarios
- Definition and implementation of strategies and procedures for responding to spills, fires, explosions, events involving hazardous materials, events affecting people, and natural events.
- Workers training and education programs
- Definition and implementation of resources, equipment and tools
- Emergency evacuation drills
- Definition of activation mechanisms and early warning system to communities
- Implemented common command and control model called Incident Command System, which allows for organized and objective-oriented decision making
- Cooperation and coordination schemes defined and formalized through mutual aid plans
- Operational information and communications available to evaluate and carry out a situational analysis of the evolution of emergencies
- Performance evaluations

Ecopetrol continuously implements training programs for all personnel involved in emergency or contingency response plans. In the last four years, 13,457 trainings have taken place to improve our employees' skills. During 2019 and 2020, 7,033 training were carried out as shown in the table below:

Graph 8 – Trained personnel



Performance improvement has been achieved through the execution of the 36 emergency and contingency plans.

Frequency of process safety incidents

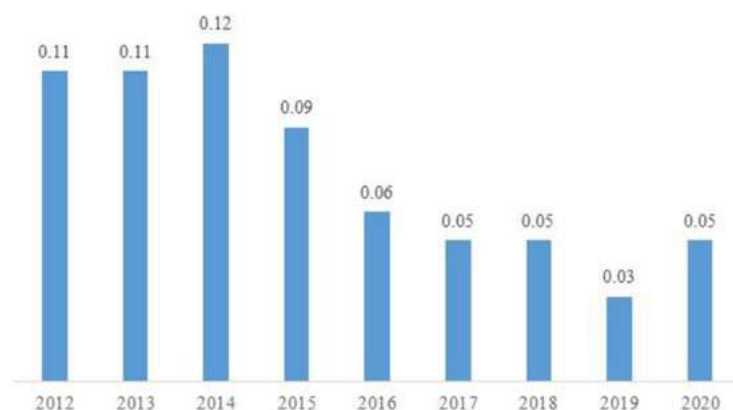
Our Process Safety Management (PSM) strategy is to: first, define high-risk processes; second, prioritize intervention in high-risk processes; and third, apply all PSM elements in the prioritized high-risk processes.

Loss of primary containment is the number of unplanned or uncontrolled releases of oil, gas or other hazardous materials.

We report Tier 1 process safety events per million hours worked, which are the losses of primary containment of greatest consequence causing harm to a member of the workforce, costly damage to equipment or exceeding defined quantities according to API-754. The reporting thresholds for API-754 Tier 1 is an unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials, from a process that results in one or more health, safety or environmental consequences set forth under those guidelines. In 2020, there were 0.05 Tier 1 process safety incidents per million hours worked, an increase from the 0.03 recorded in 2019.

Frequency of Tier 1 process safety incidents per hours worked (per million hours worked):

Graph 9 – Tier 1 Process Safety Incidents (*) ()**



* Tier 1 process safety incidents per million hours worked (API-754).

** Includes data for Ecopetrol S.A. and the Vice-Presidency of Transport and Logistics classified according to the criteria in API-754 Tier 1, but does not include Ecopetrol S.A.'s subsidiaries.

Environmental Incidents

In 2020, Ecopetrol S.A. recorded 4 environmental incidents, compared with 6 in 2019 and 11 in 2018. The volume of oil spills was 125 in 2020, a decrease from 142 barrels in 2019 and a decrease from 710.26 barrels in 2018.

Lisama 158/La Fortuna Incident

On March 2, 2018, a seepage of water and traces of crude oil occurred near the Lisama 158 well, located in the village of La Fortuna, in the Middle Magdalena Valley of Colombia. Ecopetrol activated its contingency plan to contain the spill. As of March 30, 2018, the Lisama 158 well was sealed and stopped flowing.

Ecopetrol's internal investigation concluded that there were four concurrent critical factors leading to the incident and that in the absence of any of them, the incident would not have occurred.

Corrective and mitigation actions implemented by Ecopetrol

In due course, Ecopetrol carried out all the social, environmental and technical actions to fully attend the event and mitigate other damages and manage the incident, in compliance with the obligations contained in Law 1523 of 2012, Presidential Decree 321 of 1999 and the contingency plan of the Lisama Well.

After closing the event and abandoning of the well, Ecopetrol continues to implement environmental recovery actions, in accordance with the orders given by and in coordination with the environmental authorities. Likewise, voluntary social investments have been fulfilled.

Investigations and legal claims

Investigations

As of the date of this annual report the following investigations are being conducted by environmental authorities and control agencies in respect of the incident:

On January 20, 2020, Ecopetrol was informed that the National Environmental Licensing Authority (ANLA), in the course of the administrative process initiated by said authority as a consequence of the events occurred during the Lisama 158 well spill, decided to impose a fine to Ecopetrol in an amount of COP\$5.155 million. In the course of said administrative process, the ANLA exonerated Ecopetrol from liability for some charges, due to the fact that ANLA evidenced that Ecopetrol had activated its contingency plan and implemented the corresponding actions. It also mentioned that Ecopetrol's environmental control actions were taken in an appropriate manner. Nonetheless, it decided to impose the fine, because the ANLA considered that the actions were not taken in a timely manner and because, it considered that Ecopetrol did not adopt and implement the necessary actions to correct the mechanic failures in the well, in order to prevent the environmental damage. On February 11, 2020, Ecopetrol filed a reconsideration appeal before ANLA requesting the reversal of this decision. On February 9, 2021, through Resolution 290, the decision of the ANLA was announced and reduced the fine to COP\$ 3,863,918,267. The file is now closed by the environmental authority.

The Attorney General's Office (First Solicitor's Office Delegate for Administrative Supervision) opened disciplinary investigations against certain of Ecopetrol's employees for alleged disciplinary infringements related to the oil well abandonment process.

An initial suspension order against those Ecopetrol workers was at first issued and lifted in August 2018. Currently, their investigations finished the probationary stage.

The Prosecutor's Office – National Human Rights Unit and International Human Rights has conducted a preliminary investigation against Ecopetrol and governmental employees for the alleged crime of environmental pollution due to the exploitation of mining or hydrocarbon deposits. Currently, the investigation is in the pre-trial stage.

Legal Claims

As of the date of this annual report:

There are two more actions that have been filed before the Administrative Court of Santander, related to the Lisama 158 incident:

Approximately 600 people, members of the community and fishermen who live in the vicinity of where the incident took place, filed a class action in the amount of COP \$614,503,232,689, seeking compensation for damages allegedly suffered as consequence of the incident. As of the date of this annual report the court has not scheduled a hearing date. On September 25, 2020, Ecopetrol informed Mapfre Seguros Generales de Colombia S.A. that it was seeking to invoke guarantee coverage by the guarantors.

Senator Antonio Eresmid Sanguino filed a class action, seeking protection of collective rights (no compensation or indemnification petitions), arguing that the incident led to the destruction of (i) people's health and (ii) damages to the environment caused by the incident.

On October 2, 2018, the Administrative Court of Santander (competent judge) issued an interim measure whereby the latter ordered different authorities and Ecopetrol to perform various activities to prevent any additional environmental damage to occur.

On January 16, 2020, the High Court for Administrative Matters (*Consejo de Estado*) revoked the interim measure imposed by the Administrative Court of Santander, considering that with the abandonment of the well "the risk that caused the production of the spill has been surpassed". In its ruling, the High Court for Administrative Matters also mentioned that Ecopetrol has been taking the necessary actions to solve the damages produced by the incident, and also implemented the actions to repair the alleged damage. As of the date of this annual report, both complaints were properly answered and we are still awaiting for the commencement of the evidentiary stage.

On March 22, 2018, Ecopetrol made a claim to MAPFRE SEGUROS GENERALES DE COLOMBIA S.A., based on its Control of Well Policy and received the US\$19 million in October 2019. Thereafter, as a result of the third party liability policy claim objection, Ecopetrol has taken the relevant actions to obtain the guarantee coverage of guarantors. On February 27, 2020, Ecopetrol filed a lawsuit against "MAPRE SEGUROS GENERALES DE COLOMBIA S.A." to obtain recognition and payment of COP\$ 128,807,833,685 based on civil liability. The court is analyzing the lawsuit.

3.10.3.2 *Cenit*

Cenit established its own HSE Management System based on Decree 1072 of 2015 in 2017, and this was implemented during 2018. Cenit is also leading the definition of standard HSE key process indicators (KPIs) for all of the midstream subsidiaries to be able to measure the transportation business as a whole and share the lessons learned and best practices within the industry. Cenit consolidated the 2019 KPIs and agreed upon the goals for 2020 for the transportation business to obtain the results for each subsidiary and for the entire group. Local and field operations have been mainly conducted under Ecopetrol's HSE model and guidelines, but from early 2021 Cenit controls all transportation activities under its own HSE model and guidelines.

3.10.3.3 *Cartagena Refinery*

In 2020, approximately 5,179,195 man-hours were employed conducting Reficar's business activities. Our HSE performance indicators for Total Recordable Incidents Frequency (TRIF), Process Safety Incident (PSI) and Environmental Incident (EI) were well within our established expectations.

The following table covers Reficar's TRIF for 2018, 2019 and 2020, which includes Ecopetrol Operation and Maintenance (O&M), Reficar and subcontractors. The table presents statistics related to operating and maintenance activities. Reficar has not reported fatalities during the period 2010 – 2020.

Table 46 – Performance Indicators

Metric	For the year ended December 31,		
	2020	2019	2018
Man-hours	5,179,195	6,538,295	6,779,729
Recordable accidents	1	1	12
Total recordable incidents frequency (TRIF)*	0.19	0.15	1.77
Environmental Incidents (EI)	-	-	-
Process Safety Incidents (PSI)	-	-	-

* These risks were associated with normal operations.

3.11 *Related Party and Intercompany Transactions*

Set forth below is a description of material related-party transactions. For additional information about transactions with related parties, see Note 31 to our consolidated financial statements.

Ocensa

Ecopetrol S.A. has entered into a number of agreements with its 72.65%-owned subsidiary, Ocensa, of which the following are the most significant:

In March 1995, Ecopetrol S.A. entered into an agreement for the transportation of crude oil through the Ocensa pipeline. Pursuant to the terms of this agreement, Ecopetrol S.A. was required to make monthly payments that varied, depending on both the volume of crude oil transported through the pipeline and a tariff imposed by Ocensa on the basis of Ocensa's financial projections and their expected volumes of crude oil. On January 17, 2013, this agreement was amended as a result of Ocensa's new business model. Among other changes, this amendment to the transportation agreement establishes the payment of the tariff, calculated according to Resolutions issued in 2010 by the Ministry of Mines and Energy. In 2013, another amendment was executed that modified the terms by which the payments of invoices should be made. In 2020, an amendment including security standards for the supply chain was executed.

On July 29, 2014, after Ocesa implemented and carried out an open process to receive offers to enter into transportation agreements for an extended capacity of approximately 135,000 barrels per day in Ocesa's pipeline (the P135 Project), Ocesa accepted the proposal made by Ecopetrol S.A. to enter into a ship-or-pay transportation agreement for 70,000 barrels per day of crude.

On November 20, 2014, after a total and definitive assignment agreement that was notified to Ocesa on December 15, 2016, Ecopetrol became the successor of Hocol, of a ship-or-pay transportation agreement for 17,500 barrels per day, thus increasing Ecopetrol's contracted capacity in the P135 Project to 87,500 barrels per day.

On July 1, 2017, with the consent of Ecopetrol and Ocesa, and as contemplated in the Act of Commencement of Operations issued by the Ministry of Mines and Energy (Resolution 31344 dated April 27, 2017), Ocesa started supplying increased capacity in the P135 Project.

On July 17, 2018, Ecopetrol and Ocesa entered into an amendment to the P135 Project ship-or-pay transportation agreements mentioned above (consisting of a capacity of 87,500 barrels of crude per day) in order to adjust the standard tariff and monetary conditions. This followed Ocesa having entered into a settlement agreement as approved by an arbitration panel with Frontera Energy Colombia and executed on May 15, 2018 pursuant to which the transportation tariff and monetary conditions in Ocesa's ship-or-pay transportation agreement with Frontera Energy Colombia in respect of the P135 Project were adjusted. Therefore, in application of regulatory principles, Ocesa offered similar terms to the remaining shippers of the P135 Project, including Ecopetrol, and executed (i) settlement agreements with those who accepted Ocesa's offer and (ii) the corresponding amendments to the transportation agreements.

In 2020, payments made by Ecopetrol S.A. under these two agreements amounted to US\$ 1,099.85 million.

On October 28, 2013, Ecopetrol entered into a natural gas supply contract in force until November 30, 2018, pursuant to which Ecopetrol S.A. supplies gas to Ocesa and receives a fixed price per MBTU (Million British Thermal Units). This agreement replaced the contract for natural gas supply in Cusiana entered into in December of 2004, under which Ocesa paid a variable rate to Ecopetrol. In 2018, Ecopetrol S.A. received an aggregate sum of US\$ 5.25 million under the contract. On December 1, 2018, the parties agreed to extend the term of the agreements for one year until November 30, 2019. On December 1, 2019, the parties agreed to extend the term of the agreements for two years until December 1, 2021. In 2020, Ecopetrol S.A. received an aggregate sum of US\$ 3.67 million under the contract.

Ocesa has entered into the following agreements, among others, with some of our other subsidiaries:

In March 1995, Equión and Santiago Oil Company entered into agreements for the transportation of crude oil through the Oleoducto Central S.A. (Ocesa) pipeline. In November 2012, Equión and Santiago Oil Company transferred, by means of various transactions, its shares (24.8%) and transportation rights (19.8%) holdings in the Ocesa pipeline to wholly owned subsidiaries of Ecopetrol S.A. (51%) and Talisman (49%). Equión and Santiago Oil Company kept 5% of transportation rights in Ocesa. In 2014, the transportation fees billed by Ocesa were: Equión (US\$ 44.4 million), Santiago Oil Company (US\$ 3.8 million) and Hocol (US\$ 30.8 million). On January 17, 2013, this agreement was amended as a result of Ocesa's new business model. Among other changes, the amendment to the transportation agreement establishes that tariff payments are to be calculated according to resolutions issued by the Ministry of Mines and Energy. On May 23, 2013, another amendment was executed that modified the terms by which the payments of invoices should be made. In 2020, Equión paid Ocesa US\$ 0.26 million. Hocol paid Ocesa, as assignee of transportation rights from original shippers, US\$ 30.30 million in 2020.

Oleoducto de Colombia S.A. (ODC)

Ecopetrol S.A. entered into the following agreements with its 73%-owned subsidiary, ODC:

In July 1992, a ship-and-pay agreement was signed for the transportation of hydrocarbons. Pursuant to this agreement, Ecopetrol S.A. must pay a previously agreed tariff for the volume of hydrocarbons transported. The duration of this agreement is indefinite; however, the contract will remain in force as long as Ecopetrol S.A. holds shares in Oleoducto de Colombia S.A., whether directly, or through an affiliate. As of January 2013, the parties agreed that the applicable tariff would be the one set by the Ministry of Mines and Energy (the MME Tariff). The MME Tariff had been set in 2011 for a four-year term, with a yearly adjustment based on the consumer price index. In 2020, payments made by Ecopetrol S.A. under this agreement amounted to US\$140 million.

In August 1992, an operation and maintenance agreement was signed for the Vasconia and Coveñas terminals both property of ODC. The duration of this agreement is indefinite, but can be terminated by any party upon six months' notice. The initial contract included services rendered by Ecopetrol directly or by third-party contractors hired by Ecopetrol through mandate, with a variable surcharge over expenses and third-party contracts between 5% and 12% plus any applicable taxes. In 2014, an amendment to the agreement was signed, adjusting the monthly fixed rate to include expenses of services rendered directly by Ecopetrol, plus an additional 10% fee, and to eliminate the administrative surcharge. The contract also includes a variable sum related to contracts and purchases made by Ecopetrol through mandate. In March 2015, the monthly rate was adjusted for both Vasconia and Coveñas Stations. In March 2016, an amendment to the agreement was signed, adjusting the agreement's scope to include the pipeline's maintenance and adjusting the monthly fixed rate. In December 2017, an amendment to the agreement was signed, adjusting the agreement's scope according to the change of the maintenance model of the midstream segment and including the Caucasia station and the Vasconia-Coveñas pipeline system into the scope. In March 2018, the parties amended the agreement in order to narrow the scope to the purchase and contracting management, and adjust the monthly rate. In February 2019 the scope of this agreement was amended to include planning, structuring, administration, and execution of the agreements signed with the Ministry of National Defense- Fuerzas Militares de Colombia. In July 2020, an amendment to the agreement was signed, adjusting the monthly fixed rate. Pursuant to the terms of this agreement, ODC paid approximately US\$ 4.36 million in 2020.

In March 1998, a joint operation agreement was signed for the TLU-1 Coveñas buoy. The duration of this agreement is indefinite and can be terminated by mutual agreement. In December 2013, Ecopetrol S.A. assigned its rights under this agreement to Cenit, though Ecopetrol S.A. kept its role as operator under the agreement. Pursuant to the terms of this agreement, ODC paid Ecopetrol S.A. approximately US\$0.86 million in 2020.

In September 1999, a joint operation agreement was signed for the TLU-3 Coveñas buoy between Ocesa, ODC and Ecopetrol. Pursuant to the terms of this agreement, ODC paid approximately US\$1.96 million in 2020. The duration of this agreement is indefinite. In December 2013, Ecopetrol S.A. assigned its rights under this agreement to Cenit, though Ecopetrol S.A. kept its role as operator under the agreement.

ODC has entered into the following agreements with some of our other subsidiaries:

Between March 1992 and January 1993, Hocol, Equión and Santiago Oil Company each entered into agreements with ODC for the transportation of crude oil through the Vasconia-Coveñas pipeline. The term of each of these agreements is indefinite. As of January 2013, the applicable tariff is the one set by the Ministry of Mines and Energy. In 2020, the transportation fees billed by ODC were: Equión (US\$ 0.71 million) and Hocol (US\$ 0.66 million).

Oleoducto de los Llanos Orientales (ODL)

Ecopetrol S.A. has entered into the following agreements, among others, with its 65%-owned subsidiary, ODL:

In March 2009, Ecopetrol S.A. entered into a ship-or-pay agreement with ODL that establishes a financing tariff used to pay ODL's indebtedness to Grupo Aval for five years. This agreement was superseded by a new contract executed in May 2010, with a seven-year term, to reflect new conditions agreed with Grupo Aval. In August 2013, this contract was amended, providing a new term of seven years, including a two-year grace period, and an interest rate of DTF + 2.5%. This financing tariff is collected through a trust fund, which in turn is responsible for making the debt service payments to Grupo Aval. Under this agreement, ODL has committed to transport 75,000 bpd during the initial two-year grace period of the facility and 90,000 bpd during the remaining years, including the new term. Ecopetrol S.A. is responsible for 65% of this capacity. Payments by Ecopetrol S.A. under this contract were COP\$ 63.87 billion in 2020.

In December 2009, Ecopetrol S.A. entered into a service agreement with ODL to transport crude oil. This agreement was replaced in January 2014 by a new agreement that expires in December 2020. This is a ship-or-pay agreement covering 167,000 bpd for 2014, 149,000 bpd for 2015 and 139,000 bpd until 2020. In January 2017, this agreement was amended in order to maintain the economic and commercial balance for the parties, based on changes to the standard condition of the system (to transport crude oil with a 690 cStk viscosity), reducing the "ship-or-pay" capacity from 139,000 bpd to 129,139 bpd until 2020. This agreement was extended under the "ship-and-pay" conditions until December 2021. Payments by Ecopetrol S.A. under this contract were COP\$ 678.4 billion in 2020.

In March 2010, Ecopetrol S.A. entered into a pipeline operating and maintenance agreement with ODL. This agreement had an original five-year term and was amended in 2015 to extend the term another ten years, adjusting certain conditions. In January 2017, this agreement was partially assigned by Ecopetrol to Cenit, due to matters related to the management of plants and pipeline assets. In August 2017, the maintenance obligations were partially assigned by Ecopetrol to a third party. In October 2017 and February 2018, the name of the contract, some technical definitions and the annexes of the contract were updated and certain Ecopetrol's obligations were removed, in line with the partial assignment. In March 2020 the agreement was finished by the term of the contract and the new one was assigned to a third party. Pursuant to the terms of this agreement, ODL paid to Ecopetrol S.A. COP\$ 2.17 billion, plus applicable taxes, in 2020. In addition, pursuant to the partial assignment ODL paid to Cenit COP\$ 0.05 billion, plus applicable taxes, in 2020; this agreement terminated in March 2020, and the operation was assigned to a third party.

On August 1, 2015, ODL entered into an indefinite management agreement with Oleoducto Bicentenario by means of which ODL receives legal representation and provides management services to Oleoducto Bicentenario. On August 1, 2017, the agreement was amended in order to change the way ODL is remunerated by this service, improving the structure of the agreement. Pursuant to the terms of this agreement, Bicentenario paid to ODL COP\$ 7.68 billion plus applicable taxes in 2020.

Oleoducto Bicentenario de Colombia S.A.S.

Ecopetrol S.A. has entered into the following agreements, among others, with its 55.97% owned subsidiary, Oleoducto Bicentenario:

In June 2012, Ecopetrol S.A. entered into ship-or-pay and ship-and-pay agreements with Oleoducto Bicentenario for the transportation of crude oil from Araguany to Banadía that established a price which requires the payment of Oleoducto Bicentenario's indebtedness to local banks for 12 years. This tariff is collected through a trust; the trust is also responsible for making the debt service payments to the banks. The duration of the ship-or-pay agreement is the earlier of 12 years or when the credit has been entirely paid, and the duration of the ship-and-pay agreement is 20 years after the ship-or-pay terminates. Under these agreements, Oleoducto Bicentenario has committed to transport at least 110,000 bpd, of which 55% of the agreement volume is provided directly by Ecopetrol S.A. and 0.97% indirectly by Hocol. In March 2014, the parties signed an amendment to these agreements under which Oleoducto Bicentenario acknowledges having received an advance tariff payment which can be amortized through volumes of crude transported in excess of 110,000 bpd. In April 2015, these agreements were amended to modify certain definitions to reflect new terms from the negotiation of the debt, which included a modification of participant banks and a reduction of the interest rate. In March 2017, the parties signed an amendment to these agreements in order to include the terms and conditions of the "contingent service" that involves the transportation of crude oil from Banadía to Araguany when this service is required, and includes a ship-or-pay commitment of 270,000 bpd when the contingent service is needed. In addition, this amendment includes an equivalent credit note of one and a half days of service into the original ship-or-pay agreement for the transportation of crude oil from Araguany to Banadía. Hocol has signed an amendment to the transportation agreement from Araguany to Banadía, in order to receive the related credit note in case that the availability of the service in that direction is suspended in order to enable the contingent service (Banadía-Araguany). In September 2017 the agreement was amended to specify that the "contingent capacity" could be over 180,000 barrels per any "contingent service" operation and to extend the term until July 30, 2018. In July 2018, the agreement was amended to extend the term to provide the "contingent service" until March 23, 2019. In September 2018, this agreement was assigned by Hocol to Ecopetrol. In November 2018, the agreement was amended to remove the restriction on the number of contingent services during 2018. In March 2019, the agreement was amended to extend the term to provide the "contingent service" until June 21, 2019. In June 2019, the agreement was amended to extend the term to provide the "contingent service" until September 21, 2019. In September 2019, the agreement was amended to extend the term to provide the "contingent service" until December 21, 2019. In October 2019, the agreement was amended to remove the restriction on the number of contingent services during 2019. In December 2019, the agreement was amended to extend the term to provide the "contingent service" until June 21, 2020. In June 2020 and December 2020, the agreement was amended to extend the term for six months to provide the "contingent service" until June 21, 2021. Pursuant to the terms of these agreements, in 2020, Ecopetrol and Hocol paid COP\$ 626.77 billion to Bicentenario S.A.

In June 2012, Ecopetrol S.A. and Hocol entered into storage or pay and storage and pay agreements with Oleoducto Bicentenario. Under these agreements, Oleoducto Bicentenario is committed to receive, store, preserve and deliver our crude oil. The storage or pay agreement will terminate when Oleoducto Bicentenario's indebtedness to local banks has been entirely paid, and the duration of the storage and pay agreement is 20 years after the storage or pay agreement terminates. In April 2015, this contract was amended to modify certain definitions to reflect new terms from the negotiation of the debt, which included a modification of participant banks and a reduction of the interest rate. In September 2018, this agreement was assigned by Hocol to Ecopetrol. Pursuant to the terms of this agreement, Ecopetrol and Hocol paid to Bicentenario COP\$ 39.0 billion, plus applicable taxes, in 2020.

In August 2012, Ecopetrol S.A. entered into an Operation and Maintenance agreement for the Araguany – Banadía pipeline system. The duration of this agreement is 15 years. This agreement was partially assigned in January 2017 by Ecopetrol to Cenit due to matters related to the management of plants and pipeline assets. In July 2018 Oleoducto Bicentenario and Cenit signed a settlement agreement to recognize costs related to this contract. The scope of the contract assigned by Ecopetrol to Cenit was finished by the mutual agreement of the parties (Bicentenario and Cenit) in March 2020. Pursuant to the terms of those agreements, Bicentenario paid to Cenit COP\$ 0.05 billion, plus applicable taxes, in 2020.

In November 2017, the maintenance obligations of the transportation system (from the first agreement mentioned in the preceding paragraph) were partially assigned to a third party. During December 2017, the agreement with Ecopetrol was modified to exclude from its scope the Araguany and Banadía Stations' maintenance. In November 2018, the pipeline maintenance obligations were extended until April 2019. In April 2019, the pipeline maintenance obligations were extended until July 2019. In July 2019, the pipeline maintenance obligations were extended until October 2019. In October 2019, the pipeline maintenance scope was substituted by technical supervision and in July 2020, the technical supervision scope was terminated by mutual agreement of the parties. However, the operational scope of the contract is still valid. Pursuant to the terms of this agreement, Bicentenario paid to Ecopetrol S.A. COP\$ 5.83 billion, plus applicable taxes, in 2020.

Ecodiesel

Ecopetrol S.A. (Ecopetrol) entered into a supply agreement for the Barrancabermeja refinery, with Ecodiesel Colombia S.A. (Ecodiesel), a company in which Ecopetrol has a 50% equity interest. The current agreement began on January 25, 2018. Pursuant to the terms of this agreement, Ecodiesel must deliver to Ecopetrol and Ecopetrol must in turn purchase 48,100 barrels of Ecodiesel's biodiesel production each month. Payments vary depending on the purchased volumes and the prices of biodiesel. This agreement expires on January 31, 2021. In 2020 a total of COP\$ 283.4 billion was paid under this contract. In April 2020, Ecopetrol made a spot purchase to Ecodiesel for consumption in the Port of Buenaventura for COP\$ 0.4 billion. A new agreement began on February 1, 2020 for the delivery of 50,880 barrels of Ecodiesel's biodiesel production each month. The new agreement will be active until January 31, 2026.

Additionally, Ecopetrol, as Reficar's legal agent, signed another supply agreement with Ecodiesel on October 2, 2019 that was valid until September 30, 2020 and pursuant to which Ecopetrol agreed to buy up to 156,000 barrels of biodiesel for a year from Ecodiesel. A total of COP\$ 46.4 billion was paid under this contract. On October 1, 2020, Ecopetrol and Ecodiesel signed another supply agreement for the supply of biodiesel to Reficar that is valid until September 30, 2023. Pursuant to the terms of this agreement, Ecodiesel must deliver to Reficar, and Reficar must in turn purchase 10,400 barrels of Ecodiesel's biodiesel production each month. In the fourth quarter of 2020, Reficar paid a total of COP\$ 19.6 billion to Ecodiesel under this agreement.

In 2020, Ecopetrol bought COP\$ 283.8 billion worth of biodiesel from Ecodiesel for its own consumption and COP\$ 66 billion worth of biodiesel for Reficar's consumption.

Savia Peru S.A.

On February 19, 2016, Ecopetrol S.A., as lender and shareholder of 50%, and Savia Perú S.A., as borrower, entered into a five-year loan agreement for an aggregate principal amount not to exceed US\$70 million. The proceeds of the facility were used to (i) repay short term loans and (ii) pay shortfalls related to final judgments (in case they materialize). The loan agreement accrues interest at an annual rate of 4.99%, which can be adjusted on an annual basis, with semi-annual interest payments and principal payments beginning on the 21st month following the disbursement date. Total disbursement was US\$57 million through the disbursement period ended on December 31, 2017. On December 11, 2019, Ecopetrol and Savia Perú agreed on an amendment to the terms of the loan agreement, in order to revise the payment schedule of the loan, without changing the original maturity, nor the interest rate. As of December 2020, the outstanding balance of the obligation with Ecopetrol is US\$28.3 million under the loan agreement. Korea National Oil Corporation (KNOC), as shareholder of the other 50% of Savia Perú S.A., signed a facility under the same terms and conditions as described above.

On January 19, 2021, Ecopetrol S.A. signed a Share Purchase Agreement with De Jong Capital LLC, through one of its subsidiaries as buyer, pursuant to which Ecopetrol sold its 50% ownership interest in OIG. Korea National Oil Corporation (KNOC) also sold its participation on OIG (the remaining 50%) to De Jong Capital LLC, under the same terms and conditions as Ecopetrol.

On the same date, Ecopetrol and Savia Perú agreed on an amendment to the terms of the loan agreement described above, in order to revise the payment schedule of the loan and its maturity, with the interest rate remaining unchanged. As of the date of this annual report, Savia Peru owed US\$ 26.8 million to Ecopetrol under this loan agreement.

Transactions with Other State-Controlled Entities

In the ordinary course of business, we enter into transactions with other state-owned enterprises that include but are not limited to the following:

- Selling and purchasing goods, including crude oil purchases of ANH royalties (see below);
- Properties and other assets;
- Rendering and receiving services;
- Leasing assets;
- Depositing and borrowing money; and
- Using public utilities.

In addition, we have an agreement with the ANH (National Hydrocarbons Agency) by which we purchase all crude oil delivered to the ANH as royalties by us and by third parties. The purchase price is calculated according to a formula set forth in a contract between Ecopetrol and the ANH that reflects our export sales prices (crudes and products), a quality adjustment for API gravity and sulphur content, transportation rates from the wellhead to the Coveñas or Tumaco ports and a marketing fee. We sell the physical product purchased from the ANH as part of our ordinary business.

For the years ended December 31, 2020, 2019 and 2018, we purchased the following volumes of crude oil from the ANH corresponding to royalties paid in kind by oil producers in Colombia: 31.0 million barrels, 35.4 million barrels and 37.6 million barrels, respectively. The contract between the ANH and us was extended until October 31, 2022. See the section *Business Overview—Applicable Laws and Regulations—Regulation of Exploration and Production Activities—Business Regulation—Royalties* for a description of the current royalty scheme.

The ANH is a state agency responsible for the administration and regulation of the nation's hydrocarbon resources and therefore it is controlled by the State. The State's control of the ANH arises from the fact that it is a state agency and hence a part of the Colombian government. On the other hand, Ecopetrol is a state-owned enterprise and the Nation's control of Ecopetrol results from the fact that it is one of our shareholders and owns more than a majority of our common shares. Neither Ecopetrol nor the ANH have the ability to control each other's actions. Notwithstanding that as a matter of Colombian law neither entity can influence the other, as a matter of U.S. regulation, they are considered to be under common control.

3.12 Insurance

We have a clear and defined corporate policy based on risk financing guidelines that summarizes the Company's risk transfer and retention alternatives and provides support and guidance for all the insurance-related issues of all of our affiliated and subsidiary companies.

As a proactive strategy to deal with the hardening conditions of the worldwide reinsurance market for the last three years, in July 2020, Ecopetrol became a member of the OIL Pool. OIL is an energy industry mutual insurance company based in Hamilton, Bermuda, established since 1972. This organization operates on the basis of the concept of mutualization, in which several companies threatened by similar risks and with comparable exposure profiles decide to constitute a common fund, based on the individual contribution of each one, depending on the size of their operation and the estimated losses they may suffer as a result of the materialization of such risks. OIL insures assets worldwide for a total value over US\$3trillion. Its credit rating is A (S&P) and A2 (Moody's). Currently, 61 companies in the world are members of OIL.

Under the model described above, the corporate insurance program has been consolidated in two main categories:

- i. Category A: Coverage through the OIL pool and reinsurance market that includes the risks of physical damage, control of wells and leakage, pollution or contamination (which for the purposes of this annual report, are included in the limit of the third party liability coverage).
- ii. Category B: Coverage only through the traditional insurance and reinsurance market that includes third party liability, directors and officers, cargo, crime, charterers' liability and cyber-attack insurance.

These structures provide coverage for our consolidated downstream, upstream and midstream operations in excess of our local insurance programs (when applicable).

In the tables below we set forth our insurance program and the companies covered, along with limits and coverage details.

Table 47 – Category A: Coverages through the Oil Pool and Reinsurance and Insurance Market for the Downstream Segment

US\$ Millions	Limit (eel / agg) ⁽¹⁾		Deductible		Ecopetrol Downstream	Reficar	Esenttia
	Onshore	Offshore	Onshore	Offshore			
Policies							
Property all risk	2,200	N/A	5	N/A	X	X	X
Sabotage and terrorism	600	N/A	0.5	N/A	X	X	X

(1) Eel: each and every loss. Agg: Aggregate.

Note: Due to its liquidation, Bioenergy was not included in the renewal of Ecopetrol's corporate insurance program for 2021.

Table 48 – Category A: Coverages through the Oil Pool and Reinsurance and Insurance market for the Upstream segment

US\$ Millions	Limit (eel / agg) ⁽¹⁾		Deductible		Ecopetrol		Equión	Hocol	Santiago Oil	ECP America	Permian	ECP Costa Afuera
	Onshore	Offshore	Onshore	Offshore	Upstream							
Policies												
Property all risk ⁽²⁾	400	N/A	1.0	N/A	X		X	X	X	X	X	X
Sabotage and terrorism	400	N/A	0.5	N/A	X		X	X	X	N/A	X	N/A
Control of wells ⁽³⁾	250 / 75	800 / 300	1.0	5 / 6	X		X	X	N/A	X	X	N/A

(1) Eel: each and every loss. Agg: Aggregate.

(2) US\$250 million Property All Risk but US\$400 million Maximum Loss limit and in the aggregate in respect of earthquakes.

(3) Onshore: Drilling US\$250 million; Production US\$75 million for any well. // Offshore: Drilling US\$800 million; Production US\$300 million for any well

Table 49 – Category B: Transversal Coverages through the Traditional Insurance and Reinsurance Market for the Downstream, Upstream and Midstream Segments

US\$ Millions	Limit (eel / agg) ⁽¹⁾	Deductible	Ecopetrol	Reficar	Esentia	Eventia MB	Equión	Hocol	Santiago Oil	ECP America	Permian	Brazil	ECP Costa Afuera	Cenit	Ocensa	ODL	OBC	ODC	Invercosa
Policies																			
Third party liability	500	10.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	N/A
Crime	35	0.5	X	X	X	X	X	X	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	X
Directors & Officers	65	Various	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cargo	75	3% dispatch	X	X	N/A	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Charterers	750	0.02	X	X	N/A	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cyber ⁽²⁾	25 / 150	Various	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

(1) Eel: each and every loss. Agg: Aggregate.

(2) Coverage under section one (buyback for property) only applies to Ecopetrol S.A. whereas coverage under Sections two to nine apply to Ecopetrol and its downstream, midstream and upstream subsidiaries.

Our third-party liability insurance policy covers Ecopetrol S.A., our subsidiaries and affiliates in excess of local underlying policy limits for claims made against them by third parties. Our commercial general liability coverage will pay on behalf of or indemnify amounts for which an insured becomes legally obligated to pay, including damages in respect of bodily injury, property, pollution and product liability. Coverage of bodily injury and property damage is subject to coverage territory during the policy period.

Ecopetrol's midstream subsidiaries continue having an independent program for their oil transportation companies (including crime and directors & officers policies).

Table 50 – Midstream Program

US\$ Millions	Limit (eel / agg) ⁽¹⁾		Deductible		Cenit	Ocesa	ODL	OBC	ODC
	Onshore	Offshore	Onshore	Offshore					
Policies									
Property all risk ⁽²⁾	200	200	0.250	0.50	X	X	X	X	X
Sabotage and terrorism ⁽³⁾	70	30	0.075	0.15	X	X	X	X	X
Third party liability	100	100	0.100	0.50	X	X	X	X	X
Directors & Officers ⁽⁴⁾	75		-		X	X	X	X	X
Crime	50		0.175		X	X	X	X	X

(1) Eel: each and every loss. Agg: Aggregate.

(2) US\$200 million each company and an aggregated excess shared limit of US\$750 million (aggregate for the policy period 12 months).

(3) Does not include Caño Limón – Coveñas (CLC) and Oleoducto Transandino (OTA) systems owned by Cenit.

(4) Aggregate limit of US\$75 million word wide coverage. Deductible only for coverage No.2 in the USA.

The corporate insurance programs detailed above are subject to particular conditions, limits, sub-limits, deductibles, guarantees and exclusions applying for each line of insurance and each coverage. For purposes of this annual report, only the main limits and deductibles were mentioned in each group.

With respect to offshore operations in the U.S. Gulf Coast, Ecopetrol America is party to Operating Agreements, or OAs, that include customary conditions and which contain similar terms and provisions to those in the Model Form of Offshore Deepwater Operating Agreement of the American Association of Professional Landmen. In general, pursuant to these OAs, the obligations, duties, and liabilities of the contract parties are several, and not joint or collective, for all operations covered by the OAs.

With respect to onshore operations in the U.S., Ecopetrol Permian has been included since its beginning in the Control of Wells, D&O, and cyber and crime policies. In 2020, we obtained a stand-alone policy for the third party liability coverage. Ecopetrol S.A. has a contract with an insurance broker for local policies related to domestic operations. The local policies relate to transit, accidents, mandatory policies, liability mandatory policies, and personal accidents policies, among others.

3.13 Human Resources/Labor Relations

3.13.1 Employees

As of December 31, 2020, the Ecopetrol Group had 13,977 employees, a decrease of 7.8% compared to 2019. This decrease was primarily due to the Bioenergy liquidation, the early retirement plan offered to a group of employees, resignations and termination of temporary contracts. Most of our employees are located in Colombia.

The table below presents the breakdown of Ecopetrol employees according to the business segments where they work, and the personnel of our subsidiaries for the years ended December 31, 2020, 2019 and 2018.

Table 51 – Ecopetrol Group’s Employees

	For the year ended December 31,		
	2020	2019	2018
	(Number of employees)		
Ecopetrol S.A.			
Exploration and Production			
Exploration	208	227	215
Production	2,271	2,324	2,258
Others	712	501	758
Total Exploration and Production	3,191	3,052	3,231
Downstream	-	-	-
Refining	2,526	2,661	2,696
Marketing	145	145	136
Others	38	37	74
Total Downstream	2,709	2,843	2,906
Transport	802	860	798
Others	820	796	351
Total Operations	7,522	7,551	7,286
Corporate	2,248	2,536	2,417
Total Ecopetrol S.A.	9,770	10,087	9,703
Ecopetrol America LLC.	47	66	68
Ecopetrol Permian LLC.	16	-	-
Ecopetrol USA	29	-	-
Bioenergy S.A.S.	-	478	441
Bioenergy Zona Franca S.A.S.	-	287	279
Hocol S.A.	346	249	221
Equión Energía Limited	38	242	284
Oleoducto Central S.A.	283	288	275
Oleoducto de Colombia S.A.	15	7	3
Oleoducto de los Llanos S.A.	77	79	75
Oleoducto Bicentenario de Colombia S.A.S.	-	-	-
Ecopetrol del Perú S.A.	-	-	-
Ecopetrol Costa Afuera de Colombia S.A.S.	-	-	-
Refinería de Cartagena S.A.S.	98	143	153
Ecopetrol Óleo e Gás do Brasil Ltda.	35	31	16
Esentia S.A.	417	412	428
Esentia MB	41	46	-
Cenit Transporte y Logística de Hidrocarburos S.A.S.	511	366	282
Invercolsa	2,247	2,371	-
Ecopetrol Energía S.A. E.S.P	7	5	-
TOTAL	13,977	15,157	12,228

As of December 31, 2020, the subsidiaries Kalixpan Servicios Técnicos, S. de R.L. de C.V., Topili Servicios Administrativos S. de R.L. de C.V., Ecopetrol Capital AG and Black Gold RE did not have direct employees.

Loans and investment on training and development for our employees

To improve the quality of life of our employees, Ecopetrol S.A. extends various types of loans to its employees, including housing loans and general-purpose loans. The principal amount of the loan depends on the applicant's tenure. Ecopetrol S.A. does not guarantee any loans made by third parties. In 2020, Ecopetrol S.A. has extended 833 housing loans for a total of COP\$ 209.6 billion and 1,411 general-purpose loans for a total of COP\$ 15.3 billion. In 2020, Ecopetrol S.A. also provided on-site and external training and development, which totaled to COP\$ 15.9 billion, and it extended a total of COP\$ 186.5 billion in subsidies for education.

We have not provided loans (including housing loans), extended or maintained credit lines, arranged for the extension of credit by third parties, materially modified or renewed an extension of credit lines, in the form of a personal loan to or for any of our executive officers since our ADSs were registered under the Exchange Act.

Ecopetrol does not offer credits to any of its executive officers.

Labor Regulation

In accordance with Article 123 of the Colombian Constitution and the Article 7th of the Law 1118 of 2006, our employees are considered “public servants,” even though they are subject to the common labor law. As such, their behavior is subject to the rules to those who handle public interests and goods and could be held liable for their illegal actions and omissions pursuant to the following regimes: (i) disciplinary (Law 734 of 2002), (ii) criminal or (iii) civil.

Declaration of Culture

In 2020, Ecopetrol updated its Declaration of Culture, which contains the six principles that guide our operation: (i) Life First, (ii) Collaboration, (iii) Ethics & Transparency, (iv) Innovation, (v) Excellence and (vi) Leadership.

3.13.2 Collective Bargaining Arrangements

Ecopetrol S.A.

A collective bargaining agreement with some labor unions governs labor relations between Ecopetrol and its unionized workers, which amounted to 4,933 employees as of December 31, 2020. The agreement also governs our labor relations with other 2,777 non-unionized employees who, according to current labor legislation, are beneficiaries of the collective bargaining agreement.

We currently have eleven industry-wide labor unions and nine company labor unions:

- Unión Sindical Obrera de la Industria del Petróleo — USO (industry labor union);
- Asociación de Trabajadores, Directivos, Profesionales y Técnicos de las Empresas de la Rama de Actividad Económica del Recurso Natural del Petróleo, los combustibles y sus Derivados— ADECO (industry labor union);
- Sindicato Nacional de Trabajadores de Empresas Operadoras, Contratistas, Subcontratistas de Servicios y Actividades de la Industria Petrolera, Petroquímica y Similares — SINDISPETROL (industry labor union);
- Unión de Trabajadores de la Industria Petrolera y Energética de Colombia – UTIPEC, former UTEN (industry labor union);
- Sindicato Nacional de Trabajadores de la Industria de los Hidrocarburos – SINATRINHI (industry labor union);
- Asociación Sindical de Trabajadores de la Industria de Hidrocarburos de Colombia - ASINTRAHC, (industry labor union);
- Sindicato Nacional de Trabajadores de Mantenimiento de la Industria del Petróleo, Gas y Carbón - SINTRAMANPETROL (industry labor union);
- Unión Sindical de Trabajadores del Sector Energético – USTRASEN (industry labor union)
- Sindicato de Trabajadores de la Industria Minero Energética – SINTRAMEN (industry labor union)
- Unión Sindical de los Trabajadores de Oleoductos y Poliductos - USOLEODUCTOS (industry labor union)
- Asociación Sindical de Trabajadores de la Industria del Petróleo - ASINPE (industry labor union)
- Asociación de Profesionales de Ecopetrol — ASPEC (company labor union);

- Asociación Sindical de Empleados de Ecopetrol – ASOPETROL (company labor union);
- Asociación Sindical de Trabajadores de Ecopetrol – TRASINE (company labor union);
- Asociación Sindical de Trabajadores de Ecopetrol – ASTECO (company labor union);
- Sindicato de Trabajadores Petroleros de Ecopetrol – SINPECO (company labor union);
- Sindicato de Profesionales de Ecopetrol S.A. – SINPROECOP (company labor union);
- Asociación de Profesionales y Tecnólogos Empleados de ECOPETROL S.A. – APROTECO (company labor union).
- Asociación Sindical de Trabajadores de la Industria del Petróleo e Hidrocarburos de Ecopetrol S.A. ASTIPHEC (company labor union); and
- Sindicato de Trabajadores de Ecopetrol S.A. SINTRAECO (company labor union).

In 2020, 50.3% of Ecopetrol's employees were affiliated with one of the above trade union organizations. As of the same date and in accordance with the governing legal provisions, the current Collective Bargaining Agreement (described below) applied to 78.3% of Ecopetrol S.A.'s total workers, out of which 28% were workers who were not affiliated with any Trade Union Organization but were beneficiaries of the Collective Bargaining Agreement by extension under Article 471 numeral 1 of the Substantive Labor Code.

Ecopetrol S.A.'s relations with unions are based on a permanent dialogue and communication sessions where different matters are discussed in order to solve and prevent any labor conflict.

Our current collective bargaining agreement has been in effect since July 1, 2018 and has a term of four and half years, expiring on December 31, 2022. The collective bargaining agreement included an increase in salaries at an annual rate of the local consumer price index (CPI) +1.21% for the remainder of 2018 and CPI +1.70% every year for the remainder of its duration. The agreement covers health, food, loans and transportation, among other benefits for workers, within reasonable criteria. It also includes union guarantees and addresses regulatory issues.

During 2020, the agreements contained in the Collective Labor Convention 2018 – 2022 were performed, as were other agreements signed in the framework of the collective bargaining agreement process. In addition, a number of areas of dialogue with trade unions were advanced and different issues pertaining to their interest were addressed. A total of 425 meetings were scheduled.

The Company manages compliance with trade unions rights with respect to the discount of trade union dues, permits and trade union guarantees. It also fully observes the rules governing aspects such as trade union law and other rights related to freedom of association.

4. Financial Review

Our consolidated financial statements for the years ended December 31, 2018, 2019 and 2020 were prepared in accordance with IFRS.

IFRS differs in certain significant aspects from the current Colombian IFRS (which is the accounting standard we use for local statutory reporting purposes). As a result, our financial information presented under IFRS is not directly comparable to certain of our financial information presented under Colombian IFRS. A description of the differences between Colombian IFRS and IFRS is presented under Financial Review - Summary of Differences between Internal Reporting (Colombian IFRS and IFRS) below.

Our consolidated financial statements were consolidated line by line and all transactions and - balances between subsidiaries have been eliminated. These financial statements include the financial results of all subsidiaries companies controlled, directly or indirectly, by Ecopetrol S.A. See Exhibit 1—*Consolidated companies, associates and joint ventures*, to our consolidated financial statements included in this annual report.

4.1 Factors Affecting Our Operating Results

Our operating results were affected mainly by (i) international prices of crude oil, international prices for refined products and local prices for natural gas, (ii) the reduced demand levels for crude oil and its derivative products, and (iii) volumes, product mix, exchange rate, and our operational performance. Crude oil prices and volumes are particularly important to the results of our exploration and production segments. This is because as export volumes or export prices of crude oil and products decrease or increase, our revenues do also. Results from our refining activities are also affected by the price of crude oil used as raw material, changes in international prices for refined products, change in environmental regulations, drastic changes in demand due to market factors, conversion ratios and utilization rates and refining capacity, all of which affect our refining margins. Terrorist attacks by guerillas against our pipelines and other facilities or social unrest can lead to loss of revenues by restricting the availability of transport systems for exports or sales of crude oil and products and/or production activities, in addition to the direct costs of repairing and cleaning. Finally, changes in the value of foreign currencies, particularly the U.S. dollar against the Colombian Peso, can also have a significant effect on our financial statements. See section *Trend Analysis and Sensitivity Analysis—Trend Analysis* for further information.

Sales volumes and prices

Our results from the exploration and production segment depend mainly on our sales volumes and average local and international prices for crude oil and natural gas. Additionally, sales volumes also reflect the purchase of crude oil and natural gas that we make from third parties and the ANH.

We sell crude oil and natural gas in the local and the international markets. We also process crude oil at the Barrancabermeja and Reficar refineries and sell refined and other petrochemical products in the local and international markets.

Local sales and prices

We have a number of crude oil short-term commercial agreements with local customers, and natural gas short and long-term supply contracts with gas-fired power plants and local natural gas distribution companies. Local sale prices are determined in accordance with existing regulations, contractual arrangements and the spot market, in turn, linked to international benchmarks. Local sales represented 48.4% of our total revenues, on average, for the past three years.

International sales and prices

Our international sales represented 51.6% of our total revenues, on average, for the past three years.

International sale prices are determined in accordance with contractual arrangements and the spot market, in turn, linked to international benchmarks primarily the ICE Brent benchmark.

A market diversification strategy has allowed us to capture markets where we have been able to obtain higher prices for our crudes and refined products. We sell our crudes and refined products in various regions, such as the U.S., Central America and the Caribbean, Asia and Europe. In our negotiations with potential customers, we seek to use the most liquid benchmark reference prices in each region.

Exploration costs

We account for exploratory drilling costs using the successful efforts method, whereby all costs associated with the exploration and drilling of productive wells are initially capitalized. Costs incurred in exploring and drilling dry or unsuccessful wells are expensed in the period in which the well is determined to be a dry or unsuccessful well and are accounted for under “Exploration and Project expenses.” Consequently, an increase in the number of exploratory wells we declare as dry or unsuccessful will negatively affect our results and may cause volatility in our operating expenses. See Note 4.7 to our consolidated financial statements for a summary of our accounting policy for exploration costs.

Royalties

Each of our production contracts has its own royalty arrangement in accordance with applicable law. Law 141 of 1994 established a royalty fixed rate equivalent to 20% of total production. In 1999, a modification to the royalty system established a sliding scale for royalty percentage linked to the production level of crude oil and natural gas to fields discovered after July 29, 1999, depending on whether the production is crude oil or natural gas, and on the quality of the crude oil produced. Since 2002, as a result of the enactment of Law 756 of 2002, the royalty percentage has ranged from 8% for fields producing up to five thousand bpd to 25% for fields producing an excess of 600 thousand bpd. Producing fields pay royalties in accordance with the applicable royalty rate at the time of the discovery. Also, Law 756 of 2002 establishes that in the fields of the association contracts that finalize or revert back, an additional royalty rate of 12% of the basic production applies.

Since January 2014, the ANH has collected natural gas production royalties from producers settled in cash based on a formula, regardless of whether a producer has sold the gas. As a result, we no longer commercialize this gas on behalf of the ANH. In addition, because the royalties are now payable to the ANH in cash, all the gas we produce is considered part of our reserves and production, without any deduction for royalties. The cost of natural gas royalties totaled COP\$787,466 million in 2020.

On September 30, 2020, Law 2056 of 2020, ("Through which the organization and operation of the general system of royalties is regulated"), was issued. Article 18 of this law broadened the definition of incremental production to all production from fields where additional investments have been made to increase the recovery factor. In this sense, the total production of these fields benefits from the variable royalty established in article 16 of Law 756 of 2002, and therefore, the additional 12% royalty referred to in article 39 of Law 756 of 2002 does not apply to these fields.

Purchases of hydrocarbons

We purchase all crude oil delivered to the ANH as royalties by us and by third parties. The purchase price is calculated according to a formula set forth in a contract between Ecopetrol and the ANH that reflects our export sales prices (crudes oil and products), a quality adjustment for API gravity and sulphur content, transportation rates from the wellhead to the Coveñas or Tumaco ports and a marketing fee. We sell the physical product purchased from the ANH as part of our ordinary business. The contract between the ANH and Ecopetrol S.A. was extended until October 31, 2022.

Since 2016, we have imported crude oil for Reficar feedstock when such imports result in better operational or economic performance of the Ecopetrol Group.

4.2 Effect of the COVID-19 Pandemic on our 2020 Results

The Covid-19 outbreak was first reported in late 2019 in China. Subsequently, taking into account the level of expansion, the World Health Organization (WHO) declared the outbreak as a pandemic on March 11, 2020. Said status is maintained to the date of this annual report.

Many countries have undertaken various public health measures to control the spread of COVID-19, including mandatory quarantines, forced economic shutdowns and travel restrictions, as well as economic measures to mitigate the impacts of such public health policies on their respective national economy.

On March 17, 2020, the Colombian Government, through Legislative Decree 417 of 2020, declared a 30-day state of national emergency in light of the health and economic crisis caused by the outbreak of COVID-19. On May 6, 2020, through Legislative Decree 637 of 2020, the Colombian Government declared a state of emergency for an additional 30 days. The Government has implemented various economic and public health measures to address the crisis. See "*Risk Factors – Risks Related to Colombia's Political and Regional Environment*."

The COVID-19 pandemic has also caused significant volatility in financial and commodity markets around the world. While governments have announced aid packages to the most affected people and taken macroeconomic measures to face the crisis, the COVID-19 pandemic has disrupted economies worldwide. See *“Risk Factors – Risks Related to Our Business – Our business operations could be disrupted by the Coronavirus or other pandemic disease and health events for further information on the effects of the coronavirus pandemic and – Risks Related to Colombia’s Political and Regional Environment – The worldwide economic effects of the outbreak and economic shutdown caused by the COVID-19 pandemic is adversely affecting Colombia’s economy, and the impact could be material.”*

This situation has had a significant impact on the oil industry. Most specifically, travel bans imposed by several countries and established quarantine measures reduced demand levels for oil and its derivative products in 2020. Ecopetrol’s operations were affected by this situation and as a consequence, some plants in our refineries and some of our wells were temporarily closed due to low demand and prices and the measures taken to contain the spread of COVID-19 in workers and contractors. In this context, Ecopetrol took the following actions during 2020 to face the impacts of the COVID-19 pandemic:

- Ecopetrol’s Board of Directors was permanently at the forefront of the crisis caused by Covid-19. Throughout the year, the Board of Directors held a total of 15 extraordinary sessions to direct Ecopetrol with opportunity and expeditiousness in taking measures to counteract the impacts derived from this crisis. In addition, Ecopetrol issued the “Declaration of Contingency Operation” in March 2020 and activated the equipment, plans and actions required to prevent infections, respond to new challenges in the Ecopetrol’s Group operations and enact special containment measures.
- Cuts in costs and expenses, including austerity measures, prioritization of operational and administrative activities, and control over operational expenses, such as travel restrictions, sponsorships and participation in events, among others. These measures contributed to the total unit cost for the year 2020 which was approximately USD\$ 27/bl, a decrease of 23% compared to the total unit cost for 2019.
- Disbursements under credit lines in the aggregate amount of USD\$665 million, as well as an issuance of external public debt bonds in the international capital markets in the aggregate amount of USD\$2 billion.
- Publication of a new organic investment plan for Ecopetrol Group approved by the Board of Directors on July 17, 2020 considering: (i) a detailed review of the Ecopetrol Group’s portfolio, (ii) progress in the interventions carried out, and (iii) the gradual recovery of economic activity.
- Allocated resources of COP\$85,387 million in connection with humanitarian aid and other initiatives to strengthen the Colombian health system to address the COVID-19 pandemic.
- The execution by Ecopetrol S.A. of strategic and tactical hedging operations due to its exposure to pricing indices different from the commercialization benchmark and different pricing periods between the buying and the selling of physical barrels of crude oil. A total of 30 million barrels (mmbbls) were the subject of strategic hedges oriented at protecting the Ecopetrol’s income and cash flow, limiting losses, covering production costs and avoiding potential closures of production fields. A total of 21.7 million barrels (mmbbls) were the subject of tactical hedges oriented at mitigating risks associated with storage marketing strategies, anticipated purchases of raw materials, supply to refineries, international sales delivered at the destination port and exports of heavy fuel oil.
- Recognition of impairment expenses at the end of December 31, 2020 in the aggregate amount of COP\$633,156 million, after adjusting some of the assumptions used (prices and discount rates) in the impairment evaluation carried out as of December 31, 2019, recognizing the impact on the Ecopetrol Group’s main long-term assets (some productive assets in the exploration and production segment and in the Cartagena refinery).

These measures were aimed at ensuring the sustainability of the Ecopetrol Group’s business in an environment of low prices, prioritizing cash-generating opportunities with better equilibrium prices, maintaining growth dynamics with a focus on the execution of strategic asset development plans, and in asset value preservation through investments to gain reliability, integrity and continuity to the current operation in refineries, transportation systems and production fields. Similarly, these actions are covered by Ecopetrol’s risk management policies and procedures.

In terms of Ecopetrol’s results of operations as of and for the year ended December 31, 2020, the most significant impacts were the following: (i) a reduction in revenues, especially due to the contraction in demand and a decrease in the international Brent price partially offset with the higher exchange rate, (ii) an increase in financial costs due to an increase in debt, a decrease in valuation to fair value and lower yields of the securities portfolio, which in turn were as a result of low market rates, (iii) recognition of impairment at the end of the year as described above, and (iv) an increase in our depreciation expenses, partly generated by the update of the Ecopetrol’s reserve balance.

As a result of the measures taken, the constant monitoring of the COVID-19 pandemic, the ongoing vaccination programs and the evolution of the Ecopetrol Group's results, while we cannot offer any assurances, as of the date of this annual report, Ecopetrol does not believe that the COVID-19 pandemic will have a significant impact on the Ecopetrol Group in the long-term.

Nonetheless, the Ecopetrol Group will continue to monitor the evolution of the COVID-19 pandemic and the market to determine the need to implement subsequent stages of the COVID-19 intervention plan and will continuously review impairment indicators on long-lived assets and on investments in companies.

4.3 Effect of Taxes, Exchange Rate Variation, Inflation and the Price of Oil on our Results

4.3.1 Taxes

In December 2016, the Colombian Congress adopted Law 1819, which introduced changes to the Colombian tax system, applicable beginning in 2017.

The 2016 Tax Reform included two tax benefits that are expected to improve the operations of the oil and gas industry:

Certificado de Reembolso Tributario (CERT) incentive:

For exploration activities, the "CERT" incentive was approved, consisting of the reimbursement of part of the investment made in the exploration phase.

The CERT is granted when the income tax return is filed.

The CERT can only be redeemed to pay taxes at the national level and its effective maturity date is two years after it is issued. Nevertheless, Decree 2253 of 2017 establishes that a CERT redemption can be made from year two to year five, as from the date of the granting of the incentive. The CERT can also be sold and traded in fixed income market.

For production activities, the CERT reimbursement is granted exclusively to investments that increase the recovery factor, i.e. investments that increase the reserves that are currently proved in certain wells.

On December 29, 2017, the Colombian Government issued Decree 2253, which establishes that companies who (i) qualify as operators of association agreements entered into with Ecopetrol, (ii) have exploration and production of hydrocarbons agreements and (iii) are currently involved in the exploration and production of hydrocarbons, among others, can also qualify for the CERT. Additionally, the CERT will not qualify as taxable income or capital gain for the taxpayer receiving or acquiring such incentive.

On March 23, 2018, the following Resolutions were issued in order to regulate the procedures and requirements that companies must comply to claim the CERT: 0860 of Ministry of Finance and Public Credit, 108 of ANH and 40284 and 40285 of Ministry of Mines and Energy.

On December 20, 2019, the Ministry of Finance and Public Credit informed the Company that the PGN includes the resources of CERT.

Refundable VAT on oil and gas exploration:

Taxpayers in the oil and gas industry are entitled to refund VAT paid in the exploration phase for offshore projects. Taxpayers can request for this VAT as of the next fiscal year in which the investment was made. VAT that is reimbursed cannot be used as a higher cost or expense for income tax purposes.

Additionally, in December 2018, the Colombian Congress adopted Law 1943, which introduced the following key changes to the Colombian tax system, applicable beginning in 2019, including the following aspects:

The corporate income tax rates were set to be reduced gradually from 33% to 30% as follows: 33% in 2019, 32% in 2020, 31% in 2021 and 30% from 2022 onward.

The presumptive income tax rate was reduced to 1.5% for fiscal year 2019.

Taxpayers must calculate their taxable income taking as initial base the year and result under Colombian IFRS. Accounting profit is reconciled to obtain the net income tax, which is the basis to calculate the income tax.

For fiscal year 2018 and 2019 the newly enacted dividends tax applies as follows:

- i. For non-resident shareholders: (i) a 5% dividend tax for dividends paid out of profits that were accrued as of January 1, 2017 and a 7.5% dividend tax for dividends paid out of profits that accrued as of January 1, 2019 and were taxed at the corporate level; (ii) no dividend tax on dividends paid out of profits that accrued until December 31, 2016 and were taxed at the corporate level; (iii) a 35% withholding tax rate on dividends distributed from profits not taxed at the corporate level if the dividend is paid out of profits that accrued as of January 1, 2017, plus an additional, 5% dividend tax after applying the initial 35% withholding tax rate and a 33% withholding tax rate on dividends distributed from profits not taxed at the corporate level if the dividend is paid out of profits that accrued as of January 1, 2019, plus an additional, 7.5% dividend tax after applying the initial 33% withholding tax rate; and (iv) a 35% withholding tax rate on dividends distributed from profits not taxed at the corporate if the dividend is paid out of profits that accrued until December 31, 2016.
- ii. For Colombian individuals: for fiscal year 2018, dividends paid were taxed at 5% if they were between 600 and 1,000 Tax Value Unit (UVT or *Unidad de Valor Tributario* for its Spanish acronym) and 10% if they were greater than 1,000 UVT. For fiscal year 2019, dividends paid were taxed at 15% if they were greater than 300 UVT.

Dividends paid to local corporations during 2018 were not subject to any income tax, provided that such dividends were taxed at the corporate level. For fiscal year 2019 and 2020, these dividends were taxed at 7.5%.

Tax losses accrued as of fiscal year 2017 may be offset against ordinary net income obtained in the following 12 taxable years.

Depreciation and amortization methods and annual percentages are limited to those established in the tax rule and depend on the type of asset. For example, machinery and equipment depreciate at an annual rate of 10%, infrastructure (including pipelines) at 2.22% and vehicles and computers at 20%, among others.

Income tax for free trade zone users increased from 15% to 20% as of fiscal year 2017. The tax rate for free trade zone users with a legal stability agreement (in which the income tax rate was stabilized) remains at 15% during the term of said agreement.

The general value added tax (VAT) rate increased to 19% and a differential rate of 5% for certain goods and services is maintained. The modification of the general VAT rate is effective from January 1, 2017.

The charge on financial transactions is 0.4%, with half of the tax liability being deductible.

Carbon tax accrues on the carbon content of fossil fuels used for combustion. The rate will be COP\$ 16,422 and COP\$ 17,211 per ton of CO₂, for fiscal year 2019 and 2020, respectively.

For additional information see Note 10.2.4 of our consolidated financial statements.

In October 2019, the Constitutional Court declared Law 1943 of 2018 (the Financing Law) unconstitutional effective January 1, 2020. Therefore, the Financing Law continued to have full effect for the full fiscal year 2019.

In December 2019, the Colombian Congress adopted Law 2010, which introduced the following key changes to the Colombian tax system, among others:

The corporate income tax rates will be gradually reduced from 32% to 30% as follows: 32% in 2020, 31% in 2021 and 30% in 2022 onward.

The presumptive income tax rate will be reduced to 0.5% for fiscal year 2020 and to 0% from 2021 onward.

The creation of a “normalization tax” to enable taxpayers to regularize certain omissions of information about their assets and/or incorrect information about their liabilities, subject to the payment of a 15% tax on the value of the amount of the omitted information.

Introduces the Colombian Holding Companies (CHC) regime.

As of 2020, taxes are fully deductible if they are effectively paid during the fiscal year, except for: (i) income tax, equity tax and normalization tax are non-deductible; (ii) only 50% of the financial transactions tax is deductible; and (iii) only 50% of the industry and commerce tax can be taken as a discount (tax credit) to income tax.

VAT paid on the acquisition, import, creation or construction of tangible fixed assets used in income generating activities may be treated as discount (tax credit) for income tax purposes, in the same year or in future years.

The dividend tax regime was modified and, as of 2020, is as follows:

- i. Dividends paid to non-resident shareholders: (i) a 10% dividend tax on dividends distributed from profits taxed at the corporate level (except that dividends paid to non-resident shareholders out of profits taxed at the corporate level prior to and including December 31, 2016, are not subject to this tax); or (ii) 32% withholding tax rate on dividends distributed from profits not taxed at the corporate level (31% for 2021 and 30% as of 2022), plus an additional 10% dividend tax after applying the initial 32% withholding tax rate (i.e., 38.8% in 2020).
- ii. Dividends paid to Colombian companies: (i) a 7.5% dividend tax on dividends distributed from taxed profits, or (ii) a 32% withholding tax on dividends distributed from non-taxed profits (31% on 2021 and 30% as from 2022), plus an additional 7.5% dividend tax on the balance of the dividend amount after the initial 32% withholding.
- iii. For Colombian resident individuals: dividend income in excess of 300 UVT is taxed at a rate of 10%.

Part A: Applicable Taxpayers

Resident individuals with assets located in Colombia and abroad.

Non-resident individuals with their assets located in Colombia (either with or without permanent establishment).

Non-residents with non-cash assets in Colombia.

- Foreign entities that are not income taxpayers in Colombia but who possess assets located in Colombia, other than shares of Colombian companies, accounts due from Colombian entities, mining or oil rights and/or portfolio investments (i.e., investing through a foreign funds administration account (FFAA)), provided that these entities have complied with the foreign exchange regime in respect of such excluded assets.

Part B: Tax Accrual Rules

The wealth tax at a rate of 1%, on January 1 of each fiscal year 2020 and 2021. The taxable base is the taxpayer's net equity on each of the accrual dates (gross equity less liabilities and certain exclusions, including a portion of the value of the dwelling house and 50% of the goods repatriated to normalization). In any case, the taxable base for fiscal year 2021 may not vary by more than 25% of the prior year's inflation.

Thin capitalization: A 2:1 debt-to-equity ratio determines the amount of deductible interests on loans with related parties.

Law 2010 maintains the tax regime for profits derived from indirect transfer of Colombian assets.

As of 2020, the transfer (or disposal) of real estate whose value is higher than 29,800 UVT (approximately COP\$918,436,000) will no longer be subject to the real estate consumption (excise) tax (formerly applied at 2%). This tax was specifically repealed by the Constitutional Court and was not re-introduced by Congress in Law 2010.

A special regime (the Mega Investments Regime) was created for taxpayers who (i) generate at least 400 direct jobs and (ii) make new investments in Colombia in an amount equal to or greater than 30,000,000 UVT (COP\$1,068,210,000,000) by 2020, with a view for them to calculate and settle their income tax liability for the next 20 years using the following metrics and/or policies:

- i. 27% income tax rate;
- ii. Two-year term for the depreciation for fixed assets;
- iii. Exclusion from the presumptive income regime;
- iv. Exclusion from the wealth tax; and
- v. 0.75% premium over the investment value to be paid on an annual basis.

In addition, legal taxpayers who qualify for this Mega Investment Regime are required to enter into agreements with the tax authority.

These rules do not apply to taxpayers engaged in the exploration of non-renewable natural resources.

4.3.2 Exchange Rate Variation

The functional currency of each of the companies of Ecopetrol Group is determined in relation to the main economic environment where each company operates; however, our consolidated financial results are reported in Colombian Pesos, which is the Ecopetrol Group's functional and presentation currency. A substantial part of our consolidated revenues comes from the Ecopetrol Group's companies whose functional currency is the Colombian Peso. The conversion effect from U.S. dollar to Colombian Peso is mainly due to local sales and exports of crude oil, natural gas and refined products whose prices are based on benchmarks quoted in U.S. dollars. Therefore, they are exposed to foreign currency exchange risk on revenues, capital expenditures and financial instruments that are denominated in a currency other than its functional currency.

Fluctuations in the U.S. dollar-Colombian Peso exchange rate have effects on our consolidated financial statements. As crude oil is priced in U.S. dollars, fluctuations in the exchange rate of the Colombian Peso against the U.S. dollar may have a significant impact on revenues, cost, monetary assets and liabilities held in foreign currency.

An appreciation of the Colombian Peso has a negative impact on our results of operations because our revenues from exports of crude oil, natural gas, and refined products are primarily expressed in U.S. dollars. Costs of imported products and contracted services expressed in U.S. dollars will also be lower when expressed in Colombian Pesos, but on balance, our operating income in Colombian Pesos tends to decline when the Colombian Peso appreciates, other factors being equal. The appreciation of the Colombian Peso against the U.S. dollar will also decrease the debt service requirements of our Companies with the Colombian Peso as their functional currency and with indebtedness in U.S. dollars, as the amount of the Colombian pesos necessary to pay principal and interest on foreign currency debt decreases with the appreciation of the Colombian Peso.

Conversely, when the Colombian Peso depreciates against the U.S. dollar, our reported revenues, costs related to imported products and services, operating income, and debt service requirements of foreign-denominated debt all tend to increase.

During 2020, the Colombian Peso depreciated on average 12.46% against the U.S. dollar. During 2019 and 2018, the Colombian Peso depreciated on average 11.02% and 0.2%, respectively, against the U.S. dollar. Additionally, as of December 31, 2020, December 31, 2019 and December 31, 2018, the Colombian Peso/U.S. dollar exchange rate had depreciated 4.74%, 0.84% and 8.91% respectively from the rate a year earlier.

In 2020, our consolidated debt in foreign currency increased by a total of US\$2,420 million as Ecopetrol S.A. entered into committed credit lines in an aggregate principal amount of US\$665 million and issued an SEC-registered bond in an aggregate amount of US\$2,000 million. In 2019, our consolidated debt in foreign currency decreased by a total of US\$159 million mainly as a result of amortization of foreign currency capital expenditures. In 2018, our consolidated debt in foreign currency decreased by a total of US\$2,123 million mainly as a result of prepayments of local and foreign currency of US\$2,446 million and amortization of foreign currency capital expenditures.

As of December 31, 2020, our U.S. dollar denominated total debt was US\$12,728 million, recognized in our financial statements at its amortized cost, which corresponds to the present value of cash flows, discounted at the effective interest rate of each loan. Out of the total U.S. dollar denominated debt, US\$12,598 million are in Ecopetrol S.A.'s balance sheet, whose functional currency is the Colombian Peso. Therefore, when the Colombian Peso depreciates against the U.S. dollar, Ecopetrol S.A. is exposed to an exchange rate loss. In contrast, when the Colombian Peso appreciates against the U.S. dollar, Ecopetrol S.A. has an exchange rate gain. Some of the Ecopetrol Group's companies have the U.S. dollar as their functional currency and are not exposed to a material exchange rate risk resulting from fluctuations in the Colombian Peso against the U.S. dollar. When the financial statements of the Ecopetrol Group are consolidated, the exchange rate differential of the subsidiaries' assets and liabilities whose functional currency is the U.S. dollar is recognized directly in equity, as part of other comprehensive income.

Since 2015, Ecopetrol S.A. adopted hedge accounting, using two types of natural hedges with its U.S. dollar debt as a financial instrument: (i) a cash flow hedge for exports of crude oil and (ii) a hedge of the net investment in foreign operations. As a result of the implementation of both hedges 67.9% (US\$8,549 million) of Ecopetrol S.A.'s debt in U.S. dollars, as of December 31, 2020, was designated as a hedge. With the adoption of hedge accounting, the effect of the volatility of the foreign exchange rate on the hedged portion of the debt is recognized directly in equity, as part of other comprehensive income.

The remaining portion of Ecopetrol S.A.'s U.S. dollar-denominated debt, as well as the financial assets and liabilities denominated in foreign currency, continues to be exposed to the fluctuation in the exchange rate, which means that an appreciation of the Colombian Peso against the U.S. dollar could generate a loss for companies whose functional currency is the Colombian Peso that have a net asset position in U.S. dollars or a gain if they have a net liability position in U.S. dollars. Conversely, a depreciation of the Colombian Peso against the U.S. dollar could generate a gain for companies whose functional currency is the Colombian peso that have a net asset position in U.S. dollars or a loss if they have a net liability position in U.S. dollars.

As of December 31, 2020, the Ecopetrol Group's companies have the equivalent of a net U.S. dollar liability position of US\$1,424 million after the implementation of the natural hedging previously mentioned above, minimizing the effect of exchange rate fluctuations in their results for the year.

4.3.3 Effects of Inflation

The average annual rate of inflation in Colombia for the past ten years is 3.70%. It decreased in 2020 as compared to 2019. As measured by the general consumer price index, average annual inflation in Colombia for the years ended December 31, 2020, 2019 and 2018 was 1.61%, 3.80% and 3.18%, respectively. The decrease in inflation in 2020 is mainly due to the COVID-19 pandemic, which created an abrupt supply and demand shock on Colombian CPI, particularly as a result of weak demand, significant excess productive capacity, a very tight labor market and price relief measures.

Cost inflation in the prices of goods, raw materials, debt interest expenses denominated in local currency indexed to inflation and services for operation of oil and gas producing assets can vary over time and between each market segment.

4.3.4 Effects of Crude Oil and Refined Product Prices

The average price of ICE Brent crude in 2020 was US\$43.2 per barrel as compared to US\$64.2 per barrel in 2019 and US\$71.7 per barrel in 2018. See section [Strategy and Market Overview](#) for more information.

Ecopetrol's average crude oil basket price was US\$34.4 per barrel in 2020, as compared to US\$58.6 per barrel in 2019 and US\$63.2 per barrel in 2018. The decrease of US\$24.2 per barrel in 2020 as compared to 2019 was mainly due to the decrease in the international Brent price and a weaker spread between the price of heavy crude oil versus the Brent price, which was partially offset by proactive sales and marketing management towards the diversification of clients and destinations, with sales of our Castilla and Vasconia blend crudes to South Korea, customers reactivation in India and Spain, and a sustained market share in the United States Gulf of Mexico and China.

In addition, Ecopetrol's average product basket price was US\$49.2 in 2020, US\$69.8 in 2019, and US\$77.30 in 2018. The decrease of US\$20.6 per barrel in 2020 as compared to 2019 was primarily the result of a decrease in the international Brent price, partially offset by (i) an increase in our sales volumes at the beginning of the year at higher prices and (ii) our active commercial management that allowed us to export the production surpluses, which in turn were the result of a decrease in domestic demand, largely for gasoline, diesel and jet fuel as a result of the effects of the COVID-19 pandemic.

In the [Operating Results](#) section below, we present the impact of the price decrease on our revenue and cost of sales. Additionally, fluctuations in the price of oil had an impact on the value of our oil and gas reserves. Reserves' valuation is made in accordance with SEC price regulations. Volatility in hydrocarbon prices, refining margins and reserves, as well as changes in environmental regulations may lead to the recognition of impairment or recovery of non-current assets.

For additional information about impairment charges and reversals, see sections [Operating Results—Consolidated Results of Operations—Impairment of Non-Current assets](#), [Segment Performance and Analysis](#) and Note 18 to our consolidated financial statements.

4.4 Accounting Policies

Our consolidated financial statements for the years ended December 31, 2020, 2019 and 2018 were prepared in accordance with IFRS. The detail of the accounting policies is described in Note 4 to our consolidated financial statements.

We adopted IFRS 16 – Leases as from January 1, 2019. Also, we adopted IFRS 9 – Financial Instruments and IFRS 15 – Revenue from Contracts and Customers as from January 1, 2018. The adoption of such standards did not generate a material impact in our results. For more information regarding the adoption of new accounting standards and their effects on our financial statements, see Note 5.1 [New standards adopted by the Ecopetrol Group](#) to our consolidated financial statements included in this annual report.

4.5 Critical Accounting Judgments and Estimates

Critical accounting policies are those policies that require us to exercise judgment or involve a higher degree of complexity in the application of the accounting policies that currently affect our financial condition and results of operations. The accounting judgments and estimates we make in these contexts require us to calculate variables and make assumptions about matters that are highly uncertain. In each case, if we had made other estimates, or if changes in the estimates occur from period to period, our financial condition and results of operations could be materially affected.

See Note 3 to our consolidated financial statements for a summary of the critical accounting judgments and estimates applicable to us. There are many other areas in which we use estimates about uncertain matters, but we believe the reasonably likely effect of changes or differences within critical accounting judgments and estimates would not have a material impact on our financial statements.

4.6 Operating Results

The following discussion is based on information contained in our audited consolidated financial statements and should be read in conjunction therewith.

4.6.1 Consolidated Results of Operations

The following table sets forth components of our income statement for the years ended December 31, 2020, 2019 and 2018.

Table 52 – Consolidated Income Statement

<i>Income Statement</i> (COPS Million)	For the year ended December 31,			% Change	
	2020	2019	2018	2020/2019	2019/2018
Revenue	50,223,393	71,488,512	68,603,872	(29.7)	4.2
Cost of sales	37,567,472	44,972,360	41,184,379	(16.5)	9.2
Gross Profit	12,655,921	26,516,152	27,419,493	(52.3)	(3.3)
Operating expenses	4,841,000	3,726,557	4,592,445	29.9	(18.9)
Impairment (recovery) of non-current assets, net	633,156	1,762,437	368,634	(64.1)	378.1
Operating Income	7,181,765	21,027,158	22,458,414	(65.8)	(6.4)
Finance results, net	(2,481,587)	(1,670,494)	(2,010,375)	48.6	(16.9)
Share of profit in associates and joint ventures	76,336	366,904	165,836	(79.2)	121.2
Income before income tax	4,776,514	19,723,568	20,613,875	(75.8)	(4.3)
Income tax expense	(2,038,661)	(4,718,413)	(8,258,485)	(56.8)	(42.9)
Net Income	2,737,853	15,005,155	12,355,390	(81.8)	21.4
Net income attributable to:					
Company's shareholders	1,586,677	13,744,011	11,381,386	(88.5)	20.8
Non-controlling interest	1,151,176	1,261,144	974,004	(8.7)	29.5
Net Income	2,737,853	15,005,155	12,355,390	(81.8)	21.4

4.6.1.1 Total Revenues

The following table sets forth our principal sources of third-party revenues by business segment for the years ended December 31, 2020, 2019 and 2018. An explanation of how we classify our operations into business segments is included in section 4.6.1.8 below.

Table 53 – Third-Party Revenues by Business Segment

Revenue by segment	2020			2019			2018			Change Sales Revenues (%)	
	Volume (barrels equivalent)	Average price US\$/barrel	Sales revenues (COP\$ Million)	Volume (barrels equivalent)	Average price US\$/barrel	Sales revenues (COP\$ Million)	Volume (barrels equivalent)	Average price US\$/barrel	Sales revenues (COP\$ Million)	2020/2019	2019/2018
Local Crude oil	2,208,356	28.6	230,520	2,232,087	48.6	356,857	2,919,416	60.8	550,479	(35.4)	(35.2)
Foreign Crude oil	153,185,623	34.4	19,498,553	147,692,547	58.7	28,461,601	143,208,235	63.2	26,898,737	(31.5)	5.8
Natural gas local	31,391,611	24.5	2,845,155	28,798,105	23.8	2,256,123	28,065,889	22.5	1,885,846	26.1	19.6
Foreign natural gas	554,742	8.6	17,231	506,556	16.6	27,255	530,945	17.7	27,899	(36.8)	(2.3)
Other income ⁽¹⁾	5,409,528	-	263,466	3,788,550	-	193,282	3,216,650	-	749,939	36.3	(74.2)
Exploration and production sales	192,749,860	-	22,854,925	183,017,845	-	31,295,118	177,941,135	-	30,112,900	(27.0)	3.9
Local refined products	90,659,046	54.1	17,745,376	111,095,596	74.5	27,170,498	108,781,359	81.9	26,354,549	(34.7)	3.1
Foreign refined products	39,668,072	42.4	6,165,364	44,007,684	62.3	8,977,662	41,577,284	68.6	8,485,932	(31.3)	5.8
Foreign Crude Oil	-	-	29	289,289	62.6	61,995	-	-	-	(100.0)	100.0
Other income ⁽¹⁾	-	-	894,118	-	-	183,315	-	-	107,467	387.7	70.6
Refining and petrochemicals⁽²⁾	130,327,118	-	24,804,887	155,392,569	-	36,393,470	150,358,643	-	34,947,948	(31.8)	4.1
Transportation services	-	-	2,563,581	-	-	3,799,924	-	-	3,543,024	(32.5)	7.3
Transportation and logistics	-	-	2,563,581	-	-	3,799,924	-	-	3,543,024	(32.5)	7.3
Total sales	323,076,978	-	50,223,393	338,410,414	-	71,488,512	328,299,778	-	68,603,872	(29.7)	4.2
Crude Oil	155,393,979	34.4	19,729,102	150,213,923	58.6	28,880,453	146,127,651	63.2	27,449,216	(31.7)	5.2
Natural gas	31,946,353	24.3	2,862,386	29,304,661	23.7	2,283,378	28,596,834	22.4	1,913,745	25.4	19.3
Refined products	135,736,646	49.2	24,174,206	158,891,830	69.8	36,341,442	153,575,293	77.3	35,590,420	(33.5)	2.1
Transportation services and others	-	-	3,457,699	-	-	3,983,239	-	-	3,650,491	(13.2)	9.1
Total sales	323,076,978	-	50,223,393	338,410,414	-	71,488,512	328,299,778	-	68,603,872	(29.7)	4.2

(1) Since 2020, Invercolsa's sales are recognized as income from gas service without associated volume. In order to give comparability to our financial information, the values reported as residential gas were classified as "other income" in 2019.

(2) In the case of the exploration and production segment, other income corresponds mostly to services and sales of refined products (mainly LPG and asphalt). In the case of the refining and petrochemicals segment, other income corresponds mostly to industrial services.

In 2020, total revenues decreased by 29.7% as compared to 2019, primarily as a result of: (i) a COP\$21,330,388 million decrease in revenues mainly due to a 41.3%, or US\$24.2 per barrel, decrease of our average crude oil basket price and a 29.5%, or US\$20.6 per barrel decrease of our average refined products basket price, which in case in turn was primarily the result of the decrease in the international crude oil and product reference prices, (ii) a COP\$4,246,388 million decrease in revenues attributable to the decrease in our sales volume (as further explained below) and (iii) a COP\$723,744 decrease in revenues attributable to a decrease in the service revenue of our transportations and logistics segment, which in turn was primarily due to a decrease in transported volumes. These decreases were partially offset by a COP\$5,035,401 million increase in revenues resulting from a 12.46% depreciation of the Colombian Peso against the U.S. dollar, from an average exchange rate of COP\$3,282.39/US\$1.00 in 2019 to an average exchange rate of COP\$3,691.27/US\$1.00 in 2020, resulting in an increase in revenue from exports.

The decrease of our sales volume in 2020 as compared to 2019 was the result of a 14.6%, or 23.2 mbe, decrease in refined products volumes, which in turn was primarily due to the contraction in demand caused by the COVID-19 pandemic. This decrease was partially offset by (i) a 3.4%, or 5.2 mbe, increase in our crude sales volume which was resulting from higher availability associated with lower throughput at our refineries and (ii) a 9.0%, or 2.6 mbe, increase in natural gas sales volume due to Hocol's acquisition of 100% of Chevron Petroleum Company's participation in the Guajira association contract (which corresponds to 43% of the total contract) and the entry into operation of the Cupiagua LPG plant.

In 2019, total revenues increased by 4.2% as compared to 2018, primarily as a result of: (i) a COP\$5,951,875 million increase resulting from the 11.02% depreciation of the Colombian Peso against the U.S. dollar, from an average exchange rate of COP\$2,956.55/US\$1.00 in 2018 to an average exchange rate of COP\$3,282.39/US\$1.00 in 2019, resulting in an increase in sales revenue from exports, (ii) a COP\$2,322,792 million revenue increase attributable to the increase in our sales volume explained below and (iii) a COP\$292,590 increase in services revenue from our transportations and logistics segment, primarily due to an increase in transported volumes. This increase was partially offset by: the 7.3%, or US\$4.6 per barrel, decrease of our average crude oil basket price, which in turn was primarily the result of the lower performance of the Brent crude benchmark price, and the 9.7%, or US\$7.5 per barrel decrease of our average refined products basket price, which in turn was primarily the result of the lower result of the international product prices performance, mainly in gasoline, naphtha and fuel oil prices, in spite of better diesel crack due to IMO 2020.

The increase of our sales volume in 2019 as compared to 2018 was the result of: (i) the 2.8%, or 4.1 mbpe, increase in our crude sales volume which was primarily the result of higher crude exports to Asia and the US Gulf Coast as a result of the Company's commercial strategy, higher production level and an increase of purchases, (ii) the 3.5%, or 5.3 mbe, increase in refined products volumes due to an increase in consumption in border areas, which in turn was primarily due to a decrease in imports of Venezuelan products, a change in the biodiesel blend, an increased demand for jet fuel by the aviation industry and an increase in exports of diesel due to better realization price in the international markets and (iii) the 2.5%, or 0.7 mbe, increase in natural gas sales volume, primarily due to the incorporation of new fields and marketing processes during 2019.

4.6.1.2 Cost of Sales

Our cost of sales was principally affected by the factors described below. See Note 26 to our consolidated financial statements for more detail.

Cost of sales in 2020 was COP\$37,567,472 million, representing a COP\$7,404,888 million or 16.5% decrease as compared to 2019, primarily as a result of the following factors:

- A COP\$8,857,293 million decrease in the purchase costs of crude oil, natural gas and refined products, which were purchased for sales or for refining, resulting from (i) lower average purchase prices by COP\$7,178,744 million due to the decrease in international benchmark prices for crude oil and refined products and (ii) a COP\$3,339,573 million decrease in volumes purchased primarily due to lower national demand for products, which in turn was due to the lockdown measures taken by the Colombian Government to control the COVID-19 pandemic, a decrease in our imports of diluent given the decrease in our crude production and a decrease in our imports of crude oil, which in turn was due to the decrease of activity of our refineries. This decrease was partially offset by a COP\$1,661,024 million increase in costs in Colombian Peso terms due to the depreciation of the average exchange rate of the Colombian Peso against the U.S. dollar, mentioned above.
- A COP\$545,907 million decrease in maintenance and contracted services, associated with the optimization plan performed during 2020, a renegotiation of rates and lower activity in general.
- A COP\$30,862 million decrease in other minor items.

The factors mentioned above were partially offset by: (i) a COP\$1,333,903 million increase in our consumption of inventories given a greater consumption of refined products and the effect of lower prices and (ii) a COP\$695,271 million increase in depreciation, amortization and depletion expenses primarily due to a higher level of capital investment and the devaluation of the average exchange rate of the Colombian Peso against the U.S. dollar in subsidiaries with the US dollar as their functional currency (which was partially offset by a lower depreciation rate associated with decreased levels of production).

Cost of sales in 2019 was COP\$44,972,360 million, representing a COP\$3,787,981 million or 9.2% increase as compared to 2018, primarily as a result of the following factors:

- (i) A COP\$2,197,539 million increase in the purchase costs of crude oil, natural gas and refined products, which were purchased for sales and, in the case of crude oil, for refining, which was primarily the result of (i) lower average purchase prices due to the COP\$2,894,955 million decrease in international benchmark prices for crude oil, natural gas and refined products, (ii) a COP\$2,702,726 million increase in volumes purchased, primarily to ensure domestic supply of diesel and new contracts of domestic crude and (iii) a COP\$2,389,768 million increase in costs in Colombian Peso terms due to the depreciation of the average exchange rate of the Colombian Peso against the U.S. dollar.
- (ii) A COP\$685,059 million increase in depreciation, amortization and depletion expenses primarily due to (i) an increase in our level of capital expenditures and (ii) higher production levels associated with the results of our drilling campaign. The above mentioned was partially offset by a decrease in depreciation expenses due to higher hydrocarbon proved developed reserves in 2019 as compared to 2018.
- (iii) A COP\$626,779 million increase in maintenance, contracted services and energy, associated with increased operating activity, incremental production costs, entry into operation of new wells, greater share in fields, higher electrical power rates, among others.
- (iv) A COP\$210,764 million increase in labor costs, which is primarily the result of: (i) the recognition of employee benefits under the new collective bargaining agreement, (ii) a salary increase in 2019 and (iii) an increase in the number of employees.
- (v) A COP\$470,960 million increase in taxes and contributions, primarily due to: (i) higher taxes assumed mainly for VAT on gasoline and ACPM that went from being taxed at the general rate of 19% to 5%, thus limiting the VAT discount on goods and services purchased and (ii) greater economic rights to the ANH due to the production reactivation of the CP09 field.
- (vi) A COP\$87,063 million increase in other minor items.

The factors mentioned above were partially offset by a COP\$490,183 million decrease in our consumption of inventories given our strategy to supply products in the country.

4.6.1.3 Operating Expenses before Impairment of Non-Current Assets Effects

Operating expenses, which include selling, general and administrative expenses before impairment of non-current assets amounted to COP\$4,841,000 million in 2020, a COP\$1,114,443 million or 29.9% increase as compared to 2019, mainly as a result of the following factors (see Notes 27 and 28) to our consolidated financial statements for more detail):

- A COP\$806,730 million increase in labor expenses was mainly due to (i) the recognition of the voluntary retirement plan of 421 people in 2020, which despite the current increase in expenses, is expected to result in approximately COP 0.4 trillion in future cash savings, and (ii) the salary increase in 2020 as compared to 2019.
- A COP\$283,373 million increase in general expenses mainly due to (i) the recognition of the fixed costs of some plants at the Barrancabermeja refinery that temporarily suspended their production during the Covid-19 pandemic, and (ii) expenses incurred in connection with humanitarian aid and other initiatives to strengthen the Colombian health system to address the COVID-19 pandemic.
- A COP\$224,239 million decrease in other income primarily due to an income recognized in 2019 associated to a favorable litigation related to the fill-up of the line in the transportation segment and compensation received in 2019 relating to certain environmental events and no similar events occurred in 2020.
- A COP\$115,626 million increase in other operating expenses mainly by the write-off of assets that were recognized as projects in progress, due to the completion of economic feasibility studies.
- A COP\$80,313 million increase in other minor items.

These results were partially offset by:

- A higher positive effect of COP\$321,473 million from profit on acquisition of participations and interests resulting from the (i) Hocol's acquisition in 2020 of 100% of Chevron Petroleum Company's participation in the Guajira association contract, which generated (a) COP\$1,284,372 million at Ecopetrol, a revaluation gain of the assets that Hocol already had in the Guajira association and (b) COP\$86,025 million at Hocol, a gain as its acquisition of the remaining 43% stake was considered a bargain purchase, and (ii) the effect of the increase in Invercolsa's valuation recognized in 2019 when we became their controlling shareholder which was not present in 2020.
- A COP\$74,365 million decrease in exploratory expenses mainly as a result of lower drilling in 2020 and less seismic reprocessing.

Operating expenses, which include selling, general and administrative expenses before impairment of non-current assets amounted to COP\$3,726,557 million in 2019, a COP\$865,888 million or 18.9% decrease as compared to 2018, mainly as a result of the following factors: (see Notes 27 and 28 to our consolidated financial statements for more detail).

- (i) A COP\$1,060,989 million increase in other income, with no cash impact, mainly from the difference between the fair value and book value of Invercolsa. As a result of the ruling issued by the Colombian Supreme Court of Justice in 2019, we increased our shareholding in Invercolsa from 43.35% to 51.88%, which in addition with another aspects represents a change in control of that entity; therefore, Invercolsa became our subsidiary rather than an affiliate, and we began to fully consolidate Invercolsa into our consolidated financial statements from November 2019. According to IFRS "Business combinations," the acquisition of Invercolsa was recognized at fair value.
- (ii) A COP\$623,927 million decrease in exploratory expenses mainly as a result of the recognition of spending on exploratory activity at Ecopetrol America's León 1 and 2 wells in 2018.

This decrease was partially offset by:

- (i) A COP\$229,330 million increase in general expenses mainly due to (i) the negative impact on our midstream segment of attacks by third parties and illegal valves, and (ii) an increase in our social investment made, especially the connection of the Middle Magdalena - Guillermo Gaviria Bridge trunk road in Barrancabermeja.
- (ii) A COP\$183,211 million increase in labor expenses associated with the benefits agreed to as part of the new collective bargaining agreement we entered into in 2018 and an increase in the number of employees.
- (iii) A COP\$192,875 million increase in depreciation and amortization mainly related to retirement cost of three fields without reserves.
- (iv) A COP\$59,460 million increase in taxes mainly in the industry and trade tax (associated with higher revenues) and tax on financial transactions (associated with higher cash disbursements throughout the year).
- (v) A COP\$154,152 million increase in other minor items.

Each of our operating segments bears the costs and expenses incurred for product use and marketing and each segment assumes administrative expenses and all non-operational transactions related to its activity. Discussion of operating expenses by business segment is included in the section Financial Review—Operating Results—Consolidated Results of Operations—Segment Performance and Analysis.

4.6.1.4 Impairment of Non-Current Assets

The impairment of our non-current assets includes losses (or recovery) of impairment of property, plant and equipment and natural resources, investments in companies, goodwill and other non-current assets. The Company is exposed to future risks derived mainly from variations in: (i) oil prices outlook, (ii) refining margins and profitability, (iii) cost profile, (iv) investment and maintenance expenses, (v) amount of recoverable reserves, (vi) market and country risk assessments reflected in the discount rate, and (vii) changes in domestic and international regulations, among others.

Any change in the foregoing variables used to calculate the recoverable amount of a non-current asset can have a material effect on the recognition of either losses or recovery of impairment charges in the profit or loss statement in any given fiscal year. In our business segments highly sensitive variables can include, among others: (i) in the exploration and production segment, variations of the hydrocarbon prices outlook; (ii) in the refining segment, changes in product and crude oil prices, discount rate, refining margins, changes in environmental regulations, cost structure and the level of capital expenditures; (iii) in the transportation and logistics segment, changes in tariffs regulation and transported volumes. (See Notes 3.2, 4.12 and 18 to our consolidated financial statements for more detail).

In 2020, we recognized impairment losses of non-current assets of COP\$633,156 million as compared to impairment losses of COP\$1,762,437 million in 2019 and COP\$368,634 million in 2018. These impairments are a non-cash accounting effect and consequently do not involve any disbursement or cash inflow. Further, any cumulative impairment amount of non-current assets, except for goodwill, is susceptible to reversion when the fair value of the asset exceeds its book value. On the contrary, in the event that the book value exceeds the fair value of the asset, an additional impairment expense could be recognized.

The 2020 impairment losses, net of non-current assets of COP\$633,156 million, corresponds to the net result of:

- (i) An impairment of non-current assets in the exploration and production segment of COP\$192,693 million, mainly due to the decrease in crude oil price forecast in the short and long term.
- (ii) An impairment of non-current assets in the refining and petrochemicals segment of COP\$781,528 million, primarily related to the lower refining margins at the Cartagena Refinery by COP\$440,525 million and the Barrancabermeja Refinery Modernization Plan by COP\$341,000 million, considering the progress in technical analysis of the project.
- (iii) A reversal of impairment of non-current assets in the transportation and logistics segment of COP\$341,065 million, primarily as a result of a recovery in transported volumes in 2020 through: (i) South CGU, which includes the Transandino pipeline – OTA and the port of Tumaco and (ii) North CGU, which includes the Banadía–Ayacucho’s pipeline, part of the Caño Limón-Coveñas system.

The 2019 impairment loss, net of non-current assets of COP\$1,762,437, corresponds to the net result of:

- (i) An impairment of non-current assets in the exploration and production segment primarily due to the decrease in estimations of short-term hydrocarbon price outlook, in spite of the incorporation of new reserves and technical and operational information variables and lower discount rate.
- (ii) An impairment of non-current assets in the transportation and logistics segment, primarily associated with the south generating unit, comprised of Puerto Tumaco and the TransAndino Pipeline (OTA), and the north generating unit, comprised of the Caño Limón – Coveñas Pipeline, which was especially affected by damages to its infrastructure attributed to attacks by third-parties.
- (iii) A reversal of impairment of non-current assets in the refining and petrochemicals segment, primarily related to the net effect of i) a reversal of impairment of the Cartagena Refinery due to a lower discount rate associated with external market factors, ii) an impairment loss in Bioenergy primarily due to the decrease in availability of cane, partially offset by an improvement in the projection of the realization price of ethanol and a decrease in the discount rate and iii) an impairment loss associated with the modernization plan for the Barrancabermeja refinery, considering the state of the technical alternatives analysis of possible future increases in conversion.

As mentioned above, in 2018, Ecopetrol recognized impairment losses, net of non-current assets of COP\$368,634 million, which corresponds to the net result of:

- (i) An impairment of non-current assets in the refining and petrochemicals segment, primarily due to adjustments in market expectations with respect to the impact of implementation of IMO regulations on projected margins for Reficar's refined products, (ii) a decrease in the short-term outlook for the ethanol prices given a global over-supply of ethanol, (iii) downward updates to Bioenergy's near-term agricultural outputs and (iv) an increase in the discount rate used for Reficar and Bioenergy, reflecting updated macroeconomic conditions. These negative impacts were partially offset by the commencement of the stabilization period at both Reficar and Bioenergy as well as tax benefits associated with Law 1942, 2018.
- (ii) An impairment of non-current assets in the transportation and logistics segment, primarily the result of a decrease in the forecast of the volume to be transported by the southern transportation unit and an increase in investment needs to mitigate the operative risk of our transportation systems.
- (iii) A reversal of impairment of non-current assets in the exploration and production segment primarily due to an improved short-term hydrocarbon price outlook, incorporation of new reserves and technical and operational information variables.

For more information regarding impairment by segment, see the section Financial Review—Operating Results—Consolidated Results of Operations—Segment Performance and Analysis.

4.6.1.5 Finance Results, Net

Finance results, net, mainly includes exchange rate gains or losses, interest expense, yields and interest from our investments and non-current liabilities financial costs (asset retirement obligation and post-benefits plan).

Finance results, net, amounted to a loss of COP\$2,481,587 million in 2020 as compared to a loss of COP\$1,670,494 million in 2019. This increase in loss was mainly due to:

- (i) A COP\$489,852 million increase in interest expenses, primarily as a result of the increase in the Ecopetrol Group's financial debt in 2020 given that Ecopetrol S.A. entered into committed credit lines in an aggregate principal amount of US\$665 million in committed credit lines and issued an SEC-registered bond in an aggregate amount of US\$2,000 million and the negative effect of the devaluation of the Colombian peso against the US dollar in 2020 had on our foreign currency debt.
- (ii) A COP\$327,194 million decrease in valuation to fair value and lower yields of the securities portfolio, as a result of low market rates and a lower average cash position in 2020 as compared to 2019.
- (iii) A COP\$147,458 million decrease in financial income related to retroactive dividends and interest received by us in respect of Invercolsa's profits in 2019, before we acquired control of this entity in November 2019.
- (iv) A COP\$152,724 million increase in financial expenses related to long term obligations, which in turn was mainly to the increase in our asset retirement and pension obligations.

This increase was partially offset by the positive impact resulting from the strong appreciation of the Colombian Peso against the U.S. dollar in the last quarter of 2020 had on our U.S. dollar net liability position. In 2020, our exchange rate gain was COP\$346,774 million, as compared to a gain of COP\$40,639 million in 2019.

Finance results, net, amounted to a loss of COP\$1,670,494 million in 2019 as compared to a loss of COP\$2,010,375 million in 2018. This decrease in loss was mainly due to:

- A COP\$504,924 million decrease in interest expenses, primarily as a result of prepayments of debt in 2018 which generated interest savings in 2019.
- A COP\$147,458 million increase in financial income related to retroactive dividends plus interest received by us in respect of Invercolsa's profits, which were declared during the time the legal proceeding was underway, associated with the increase in equity interest granted to us as a result of the favorable ruling.

This decrease was partially offset by:

- the negative impact resulting from the 0.8% depreciation of the Colombian Peso against the U.S. dollar on our U.S. dollar net debt position. In 2019, our exchange rate gain was COP\$40,639 million, as compared to a gain of COP\$372,223 million in 2018.
- A COP\$19,083 million increase in losses related to other minor financial items.

For more details on our financial income and expenses see Note 29 to our consolidated financial statements for more details.

4.6.1.6 Income Tax

Income taxes amounted to and COP\$2,038,661 million in 2020, COP\$4,718,413 million in 2019 and COP\$8,258,485 million in 2018. The above is equivalent to an effective tax rate of 42.7%, 23.9% and 40.1% in 2020, 2019 and 2018, respectively.

The increase in the effective tax rate from 2019 to 2020 was mainly due to: (i) the recognition of a deferred tax asset in the amount of COP\$1,550,152 in 2019 as a result of the expectation to recover the historical tax losses of Ecopetrol America that were not recognized up until that time, and (ii) higher losses in the Ecopetrol Group's companies that are taxed under a special regime. This increase was partially offset by Ecopetrol S.A.'s presumptive income in 2020 being taxed at a lower nominal rate.

The decrease in the effective tax rate from 2018 to 2019 was mainly due to the following: i) the agreement signed with Oxy in the U.S. Permian Basin as described elsewhere in this annual report, due to which the Company expects that sufficient future taxable income will be generated in its subsidiaries located in the United States to deduct the historical tax losses of Ecopetrol America. Under IFRS regulations, we are allowed to create a deferred tax receivable in the amount of COP\$1,550,152 million, which will gradually offset against the tax charge on future taxable profits generated; ii) the accounting recognition of the market value of our increased equity interest in Invercolsa did not generate a tax charge as it did not constitute non-fiscal revenue and iii) a 4% decrease in the nominal tax rate established by the Colombian Financing Law (*Ley de Financiamiento*).

See Note 10 to our consolidated financial statements for more details.

4.6.1.7 Net Income (Loss) Attributable to Owners of Ecopetrol

As a result of the foregoing, in 2020, net income attributable to owners of Ecopetrol was COP\$1,586,677. In 2019, net income attributable to owners of Ecopetrol was COP\$13,744,011, whereas in 2018 net income attributable to owners of Ecopetrol was COP\$11,381,386 million.

4.6.1.8 Segment Performance and Analysis

In this section, including the tables below, we present our financial information by segment: Exploration and Production, Refining and Petrochemicals and Transportation and Logistics. See the section Business Overview for a description of each segment.

The following tables present our revenues and net income by business segment for the years ended December 31, 2020, 2019 and 2018:

Table 54 – Revenues by Business Segment

	For the year ended December 31,			% Change	
	2020	2019	2018	2020/2019	2019/2018
	(COPS Million)				
Exploration and Production	36,839,997	52,667,990	50,372,764	(30.1)	4.6
Third parties	22,854,925	31,295,118	30,112,900	(27.0)	3.9
Local crude oil	230,520	356,857	550,479	(35.4)	(35.2)
Foreign crude oil	19,498,553	28,461,601	26,898,737	(31.5)	5.8
Local natural gas	2,845,155	2,256,123	1,885,846	26.1	19.6
Foreign natural gas	17,231	27,255	27,899	(36.8)	(2.3)
Other income	263,466	193,282	749,939	36.3	(74.2)
Inter-segment net operating revenues	13,985,072	21,372,872	20,259,864	(34.6)	5.5
Refining and Petrochemicals	26,104,351	38,770,806	37,011,373	(32.7)	4.8
Third parties	24,804,887	36,393,470	34,947,948	(31.8)	4.1
Local refined products	17,745,376	27,170,498	26,354,549	(34.7)	3.1
Foreign refined products	6,165,364	8,977,662	8,485,932	(31.3)	5.8
Foreign crude oil	29	61,995	-	(100.0)	100.0
Other income ⁽¹⁾	894,118	183,315	107,467	387.7	70.6
Inter-segment net operating revenues	1,299,464	2,377,336	2,063,425	(45.3)	15.2
Transportation and Logistics	12,194,440	13,070,736	11,354,167	(6.7)	15.1
Third parties	2,563,581	3,799,924	3,543,024	(32.5)	7.3
Inter-segment net operating revenues	9,630,859	9,270,812	7,811,143	3.9	18.7
Eliminations of consolidations	(24,915,395)	(33,021,020)	(30,134,432)	(24.5)	9.6
Total revenues	50,223,393	71,488,512	68,603,872	(29.7)	4.2

(1) Since 2020, Invercolsa's sales are recognized as income from gas service without associated volume. In order to give comparability to our financial information, the values reported as residential gas were classified as "other income" in 2019.

Total revenues by segment include exports and local sales to third-parties and inter-segment sales. See the section *Financial Review—Operating Results—Consolidated Results of Operations—Total Revenues* for prices and volumes to third parties.

Table 55 – Operating and Net Income by Business Segment

	For the year ended December 31,			% Change	
	2020	2019	2018	2020/2019	2019/2018
	(COPS Million)				
Exploration and Production					
Operating Income	1,149,291	11,601,485	15,899,337	(90.0)	(27.0)
Net income attributable to owners	(139,279)	9,382,129	9,930,519	(101.0)	(6.0)
Refining and Petrochemicals					
Operating Income	(2,185,511)	1,142,204	(757,793)	(291.0)	(251.0)
Net income attributable to owners	(2,848,511)	117,708	(1,973,075)	(2,520.0)	(106.0)
Transportation and Logistics					
Operating Income	8,218,724	8,366,747	7,317,513	(2.0)	14.0
Net income attributable to owners	4,574,800	4,244,860	3,424,234	8.0	24.0
Eliminations in consolidation					
Operating Income	(739)	(83,278)	(643)	(99.0)	12,851.0
Net income attributable to owners	(333)	(686)	(292)	(51.0)	135.0
Ecopetrol consolidated					
Operating Income	7,181,765	21,027,158	22,458,414	(66.0)	(6.0)
Net income attributable to owners	1,586,677	13,744,011	11,381,386	(88.0)	21.0

4.6.1.9 Exploration and Production Segment Results

In 2020, exploration and production segment sales were COP\$36,839,997 million, compared to COP\$52,667,990 million in 2019. In 2020, our segment sales decreased by 30.1% as compared with 2019 mainly as a result of:

- (i) The 27.0% decrease in sales of crude oil to third parties in 2020 as compared to 2019 primarily due to: (i) a decrease in the price of our crude oil basket of US\$21.0 per barrel, (ii) an increased spread in our crude oil basket versus the Brent price, (iii) lower production levels, primarily due to lower demand as a result of the mobility restrictions and lockdown that were imposed throughout the year because of the COVID-19 pandemic and impacts due to public order issues. This decrease was partially offset by (i) the depreciation of the Colombian Peso against the U.S. dollar, resulting in an increase in revenue recorded in U.S. dollars, (ii) an increase in crude oil sales of 5.2 mmbbls, which in turn was primarily related to an increase in availability associated with lower throughput at our refineries, (iii) an increase in natural gas sales of 2.6 mmbbls, which in turn was primarily due to Hocol's acquisition of 100% of Chevron Petroleum Company's participation in the Guajira association contract (which corresponds to 43% of the total contract), positive results of our United States Permian operations, the reversion of the Pauto and Floreña fields from Equión to Ecopetrol and the start-up of the Cupiagua LPG Plant.
- (ii) The 34.6% decrease in inter-segment revenues in 2020 as compared to 2019 mainly due to: (i) the decrease in the price of our crude oil basket and a worsening spread as compared to the Brent price and (ii) lower refineries throughputs due to the global contraction in demand as a result of the COVID-19 pandemic. This decrease was partially offset by the impact of the depreciation of the Colombian Peso against the U.S. dollar.

In 2019, exploration and production segment sales were COP\$52,667,990 million, compared to COP\$50,372,764 million in 2018. In 2019, our segment sales increased by 4.6% as compared with 2018 mainly as a result of:

- (i) Increased sales of crude oil to third parties, which increased by 3.9% in 2019 as compared to 2018 primarily due to: (i) an increase in local and exports sales of crude oil (4.1 mmbbls) mainly due to higher crude exports to Asia and the US Gulf Coast as a result of the Company's commercial strategy, a higher production level and an increase of purchases to third parties, (ii) an increase in sales of natural gas (0.7 mmbbls) due to greater demand, (iii) an increased spread in our crude oil basket versus the Brent price and (iii) the depreciation of the Colombian Peso against the U.S. dollar, resulting in an increase in sales revenue recorded in U.S. dollars. This increase was partially offset by the decrease in the price of our crude oil basket of US\$4.6 per barrel.
- (ii) Increased inter-segment revenues, which increased by 5.5% in 2019 as compared to 2018 mainly due to: i) higher production volumes as a result of drilling campaigns and purchases to third parties, emphasized deliveries of crude oil in order to supply Reficar and Barrancabermeja in order to replace imported crudes and (ii) the depreciation of the Colombian Peso against the U.S. dollar. This increase was partially offset by the decrease in the price of our crude oil basket in spite of better spreads as compared to the Brent price.

Cost of sales affecting our exploration and production segment are mainly related to: (i) the amortization and depletion of our production assets, (ii) contracted services and (iii) costs related to maintenance, operational services, electric power, projects and labor cost. In addition, this segment's costs are impacted by the purchases of crude oil from ANH and third parties, naphtha for dilution and transportation services.

In 2020, the cost of sales for this segment decreased by 9.5% as compared with 2019 due to the net effect of:

- (i) Fixed costs decreasing by 1.1%, or COP\$108,644 million, in 2020 as compared to 2019 mainly due to the optimization plan adopted by the Ecopetrol Group which was reflected in fewer contracted services, lower process materials usage and lower general costs. This decrease was partially offset by higher fixed transportation costs, primarily due to the depreciation of Colombian Peso against U.S dollar.
- (ii) Variable costs decreasing by 12.5%, or COP\$ 3,356,802 million in 2020 as compared to 2019, as a result of (i) the decrease in the price of our crude oil basket resulting in a lower cost of oil, (ii) a decrease in volume of naphtha purchased for dilution as a consequence of lower production of heavy oil and (iii) non-execution of reversal cycles in the Bicentenario pipeline and lower transported volume. The latter was partially offset by (i) an increase in crude oil volume purchases due to a strategy that enabled further optimization of the supply chain, (ii) the decrease in the price of our crude oil basket that impacted the inventory valuation and (iii) higher energy purchases given operative issues in our self-generating plants.

In 2019, the cost of sales for this segment increased by 12.8% as compared with 2018, due to the net effect of:

- (i) Fixed costs increasing by 8.1%, or COP\$716,252 million, in 2019 as compared to 2018, mainly due to: (i) an increase in planned maintenance, higher tariffs and the depreciation of the Colombian Peso against the U.S dollar and (ii) higher labor costs due the recognition of salary increases and benefits for employees under our new collective bargaining agreement along with an increase in the number of employees.
- (ii) Variable costs increasing by 14.6%, or COP\$3,418,429 million, in 2019 as compared to 2018, as a result of (i) an increase of purchases of crude oil due to the strategy, which enables further optimization of the supply chain, (ii) higher transportation costs due to the use of alternative oil pipelines to transport crude oil given attacks against the Caño Limón - Coveñas pipeline and an increase in tariffs, (iii) an increase in natural gas royalties due to higher production, (iv) an increase in depreciation and amortization mainly due to increased investment levels which in turn were primarily due to positive results from the drilling campaign and the improvement in the asset recovery factor and (v) an increase in electricity cost related to higher tariffs.

In 2020, operating expenses before impairment of non-current assets decreased by 4.5% as compared to 2019 primarily as a net result of: (i) recorded gain on interests derived from Hocol's acquisition of 100% of Chevron Petroleum Company's participation in the Guajira Contract (which corresponds to 43% of the total contract) and (ii) a decrease in exploratory activity mainly as a result of lower drilling and seismic activity. The latter was partially offset by (i) higher labor expenses due to certain employees choosing to accept a voluntary retirement plan we offered in 2020, (ii) the write off of certain assets due to the completion of economic feasibility studies, (iii) higher environmental provisions and asset retirement obligations for noncommercial wells, (iv) social investment costs associated with our support to the country to combat the COVID-19 pandemic, and (v) increase in fees and freight costs for exports to China and Korea.

In 2019, operating expenses before impairment of non-current assets decreased by 10.3% as compared to 2018 primarily as a net result of: (i) a decrease in exploratory expenses mainly as a result of the recognition of spending on exploratory activity at Ecopetrol America's León 1 and 2 wells in 2018, (ii) an increase in depreciation and amortization related to retirement costs of three fields without reserves, (iii) an increase in social investments made by the Company, (iv) higher taxes mainly the industry and trade tax due to a sales increase and (v) an increase in the level of seismic acquisition compared to 2018, with the COL5 and Saturn programs in Brazil.

There was an impairment of non-current assets recognized in the exploration and production segment in 2020, totaling COP\$192,594 million in 2020 as compared to a COP\$1,982,044 million in 2019. The impairment loss in this segment in 2020 was mainly due to the decrease in the crude oil price forecast in the short and long term.

There was an impairment of non-current assets recognized in the exploration and production segment in 2019, totaling COP\$1,982,044 billion in 2019 as compared to the net reversal of COP\$785,940 million in 2018. The impairment loss in this segment in 2019 was mainly due to (i) a decrease in the price projection of our crude oil and ii) an increase in net book value as a result of higher asset short-term retirement obligations.

Because of all the above, the segment recorded a net loss attributable to owners of Ecopetrol of COP\$139,279 million in 2020 as compared to net income attributable to owners of Ecopetrol of COP\$9,382,129 million in 2019 and net income attributable to owners of Ecopetrol of COP\$9,930,519 million in 2018.

Lifting and Production Costs

The aggregate average production cost, on a Colombian Peso basis, decreased to COP\$ 28,634 per boe during 2020 from COP\$ 29,275 per boe during 2019. This decrease was primarily due to:

- (i) A decrease in activity, mainly in subsoil and surface maintenance, primarily due to the restrictions driven by the COVID-19 pandemic.
- (ii) A decrease in costs related to support services in line with the decrease in our operating activity and a decrease in supplies used in the production process.
- (iii) An increase in the cost of energy, primarily due to the use of more costly thermal generation and an increase in our purchases from the national interconnected system; partially offset by our new energy self-generation strategies, which led to a reduction in diesel, fuel oil and residual distillate energy costs.
- (iv) A decrease in costs related to optimizations in maintenance contracts and others, which allowed us to have better rates and discounts in operation contracts.

On a dollar basis, the aggregate average production cost decreased to US\$ 7.75 per boe in 2020 from US\$8.92 per boe in 2019 primarily due to a 12.46% depreciation of the Colombian Peso against the U.S. dollar in 2020.

The aggregate average lifting cost, on a Colombian Peso basis, decreased to COP\$ 27,555 per boe during 2020 from COP\$28,100 per boe during 2019, primarily due to:

- (i) A decrease in activity, mainly in subsoil and surface maintenance, primarily due to the restrictions driven by the COVID-19 pandemic.
- (ii) A decrease in costs related to support services in line with the decrease in our operating activity and a decrease in supplies used in the production process.
- (iii) An increase in the cost of energy, primarily due to the use of more costly thermal generation and an increase in our purchases from the national interconnected system; partially offset by our new energy self-generation strategies, which led to a reduction in diesel, fuel oil and residual distillate energy costs.
- (iv) A decrease in costs related to optimizations in maintenance contracts and others, which allowed us to have better rates and discounts in operation contracts.
- (v) A decrease in property production volumes compared to 2019 of 6.7 mbed per day.

On a dollar basis, the aggregate average lifting cost decreased to US\$ 7.46 per boe in 2020 from US\$8.56 per boe in 2019 due to a 12.46% depreciation of the Colombian Peso against the U.S. dollar in 2020.

The difference between the aggregate average lifting cost and aggregate average production cost is that lifting costs does not include costs related to consumption of hydrocarbons by the Company in our production process or the output that the Company sells to our refineries and natural gas liquid plants.

The following table sets forth crude oil and natural gas average sales prices, the aggregate average lifting costs and aggregate average unit production cost for the years ended December 31, 2020, 2019 and 2018.

Table 56 – Crude Oil and Natural Gas Average Prices and Costs

	2020	2019	2018
Crude Oil Average Sales Price (US\$ per barrel) ⁽¹⁾	34.4	58.6	63.2
Crude Oil Average Sales Price (COP\$ per barrel) ⁽¹⁾	126,962	192,262	187,845
Natural Gas Average Sales Price (US\$ per barrel equivalent)	4.3	4.2	3.9
Natural Gas Average Sales Price (COP\$ per barrel equivalent) ⁽²⁾	15,719	13,670	11,741
Aggregate Average Unit Production Costs (US\$ per boe) ⁽³⁾	7.75	8.92	9.40
Aggregate Average Unit Production Cost (COP\$ per boe) ⁽³⁾	28,634	29,275	27,782
Aggregate Average Lifting Costs (US\$ per boe) ⁽⁴⁾⁽⁵⁾⁽⁶⁾	7.46	8.56	8.66
Aggregate Average Lifting Costs (COP\$ per boe) ⁽⁴⁾⁽⁵⁾⁽⁶⁾	27,555	28,100	25,614

(1) Corresponds to our average sales price on a consolidated basis.

(2) Since 2020, Invercolsa's sales are recognized as income from gas service without associated volume. In order to give comparability to our financial information, the values reported as residential gas were classified as "other income" in 2019.

(3) Unit production costs correspond to consolidated average costs on total production volumes net of royalties. Production costs do not include costs related to transport, commercialization and administrative expenses.

(4) Lifting costs per barrel are calculated based on total production (excluding production tests and discovered undeveloped fields), which are net of royalties, and correspond to our lifting costs on a consolidated basis.

(5) The cost indicator is calculated by using the cost of production (does not include costs related to hydrocarbons consumption by Ecopetrol in the production process, such as by our refineries and natural gas liquid plants) and dividing by the net produced volume (excluding royalties) as the denominator.

(6) As a result of the evaluation of control over companies under IFRS, Ecopetrol does not consolidate Savia Perú and Equión.

4.6.1.10 Transportation and Logistics Segment Results

In 2020, our transportation and logistics segment sales were COP\$12,194,440 million compared to COP\$13,070,736 million in 2019. The 6.7% decrease in 2020 as compared with 2019 was mainly due to: (i) lower volumes of crude oil transported through our pipelines which was primarily due to a decrease of oil production at the national level, including production by third parties, (ii) a decrease in the volumes of refined products transported mainly due to lower demand as a result of the mobility restrictions and quarantines that were imposed throughout the year in order to combat the of the COVID-19 pandemic, (iii) the impact of IFRS 15 in revenue recognition from contracts with customers given that during 2020 the revenue associated with our ship or pay contracts in the Bicentenario and Caño Limón- Coveñas pipelines were not recognized due to the ongoing legal process we were under with some of their shippers (See Note 23.3 to our consolidated financial statements for more details) and (iv) a decrease in our sales of services due to zero reversal cycles through the Bicentenario pipeline during the year as result of a stable operation of the Caño Limón - Coveñas pipeline throughout 2020. This decrease was partially offset by the positive effect on our U.S. dollar-indexed transportation fees resulting from the depreciation of the Colombian peso against the U.S. dollar, previously mentioned.

In 2019, our transportation and logistics segment sales were COP\$13,070,736 million compared to COP\$11,354,167 million in 2018. The 15.1% increase in 2019 as compared with 2018 was mainly due to: (i) higher volumes of crude oil transported through our pipelines which was primarily due to an increase of oil production at the national level, including production by third parties, (ii) reversal cycles through the Bicentenario pipeline, (iii) commercial strategies implemented for industrial services such as oil dilution, unloading facilities at the Monterrey facility that enabled the transport of oil previously transported outside of our infrastructure and oil injection at Ayacucho, (iv) an increase in the volume of refined products transported mainly due to growth of the border zone demand and higher volumes in the Cartagena - Baranoa pipeline and, (v) the positive effect on our U.S. dollar-indexed transportation fees resulting from the depreciation of the Colombian peso against the U.S. dollar.

The cost of sales for our transportation and logistics segment is mainly related to: (i) project costs associated with the maintenance of transportation networks and (ii) operating costs related to these systems, including the costs of labor, energy, fuels and lubricants and others.

The cost of sales amounted to COP\$3,381,357 in 2020 as compared to COP\$3,738,194 million in 2019. The cost of sales for this segment decreased by 9.5% in 2020 as compared with 2019 mainly due to (i) a decrease in costs associated with lower transported volumes, (ii) lower fixed costs mainly as a result of contract renegotiations, (iii) a decrease in depreciation as a result of an adjustment in the useful life of some of our transportations systems, and (iv) a decrease in costs related to the rescheduling of maintenance activities throughout the year, which in turn was primarily due to the effects of the COVID-19 pandemic.

The cost of sales amounted to COP\$3,738,194 million in 2019 as compared to COP\$3,402,087 million in 2018. The cost of sales for this segment increased by 9.9% in 2019 as compared with 2018 mainly due to (i) an increase in costs associated with higher transported volumes, (ii) an increased consumption of materials, supplies and depreciation resulting from an adjustment in the useful life of some of our transportations systems, and (iii) higher electricity market prices.

In 2020, operating expenses before the impairment of non-current assets increased by 27.6% as compared to 2019 due to: (i) an increase in labor expenses given that certain of the segment's employees chose to take the voluntary retirement plan we offered in 2020 and (ii) an extraordinary income recognized in 2019 associated to a favorable litigation related to Ocesa's line filled and no similar income in 2020. This increase was partially offset by a decrease in the expenses associated to the remediation of the damages caused by terrorist attacks and illicit taps into our transportation infrastructure.

In 2019, operating expenses before the impairment of non-current assets increased by 57.8% as compared to 2018 due to the expenses associated to the remediation of the damages caused by terrorist attacks and illicit taps in our transportation infrastructure. This increase was partially offset by the favorable ruling in the arbitration claim regarding Ocesa's line filled with Equión and Santiago.

The reversal of impairment of non-current assets recognized in the segment in 2020, totaled COP\$341,065 million as compared to impairment losses of non-current assets of COP\$232,556 million in 2019. This reversal in the impairment of this segment was primarily by a recovery in transported volumes in 2020 through: (i) South CGU, which includes the Transandino pipeline – OTA and the port of Tumaco and (ii) North CGU, which includes the Banadia- Ayacucho pipeline, part of the Caño Limon- Coveñas system.

The impairment losses of non-current assets recognized in the segment in 2019, totaled COP\$232,556 million in 2019 as compared to impairment losses of non-current assets of COP\$169,870 million in 2018. The increase in the impairment loss of this segment was primarily the result of a decrease in the forecast of the volume to be transported by the southern cash generating unit, Transandino pipeline and the impact of the terrorist attacks that took place in the Banadia- Ayacucho portion of the Caño Limon- Coveñas pipeline.

The segment recorded net income attributable to owners of Ecopetrol of COP\$4,574,800 million in 2020 as compared to net income of COP\$4,244,860 million in 2019 and COP\$3,424,234 million in 2018.

4.6.1.11 Refining and Petrochemicals Segment Results

In 2020, the refining and petrochemical segment sales were COP\$26,104,351 million compared to COP\$38,770,806 million in 2019. In 2020, sales of refined products and petrochemicals decreased by 32.7% as compared with 2019, mainly due to (i) a decrease of our volumes of gasoline and diesel sales due to a drastic worldwide drop in demand as a result of the COVID-19 pandemic and (ii) lower prices of the product basket given external market factors. This decrease was partially offset by: (i) the depreciation of the Colombian Peso against the U.S dollar, resulting in an increase in sales revenue recorded in U.S. dollars, (ii) higher volumes of polypropylene produced by Esentia and the strengthening of its international margins and (iii) the consolidation of Invercolsa into our consolidated results of operations as from November 2019.

In 2019, the refining and petrochemical segment sales were COP\$38,770,806 million compared to COP\$37,011,373 million in 2018. In 2019, sales of refined products and petrochemicals increased by 4.6% as compared with 2018, mainly due to (i) an increase of our diesel exports due to their improved economic performance in the international market and (ii) the depreciation of the Colombian Peso against the U.S dollar, resulting in an increase in sales revenue recorded in U.S. dollars. This increase was partially offset by lower prices of our refined product basket and the weakening of international fuel prices.

The cost of sales for our refined products and petrochemicals segment is mainly related to the purchase of crude oil and natural gas for our refineries, imported crude oil and products to supply local demand, feedstock transportation services, services contracted for maintenance of the refineries and the amortization and depreciation of refining assets. Cost of sales amounted to COP\$25,825,555 million in 2020, compared to COP\$37,856,219 million in 2019 and COP\$35,658,753 million in 2018.

In 2020, the cost of sales for this segment decreased 31.8% as compared with 2019, principally due to (i) decreased in volume purchases of crude oil for use by our refineries primarily due to lower throughput, which in turn was caused by the COVID-19 pandemic (ii) lower average purchase prices, (iii) a decrease in diesel imports associated with the lower demand caused by COVID-19 national lockdowns and (iii) the inclusion of a higher percentage of domestic crude in the Cartagena refinery, which resulted in a more cost-effective crude slate.

In 2019, the cost of sales for this segment increased 6.2% as compared with 2018, principally due to (i) increased purchases of crude oil for use by our Cartagena refinery primarily due to higher throughput and higher feedstock costs due to the appreciation of our crude as compared to Brent, (ii) an increase in diesel imports associated with first quarter operational events in the Barrancabermeja refinery as well as increased purchases of products to reduce the sulphur content of fuels for the local market. This increase was partially offset by the inclusion of a higher percentage of domestic crude in the Cartagena refinery, which resulted in a more cost-effective crude slate.

In 2020, operating expenses before the impairment of non-current assets increased by 649% as compared to 2019, mainly due to: (i) an increase in income as a result of our recognition of the Invercolsa's valuation in 2019 once we became their controlling shareholder and no similar recognition in 2020, (ii) recognition of the fixed cost of plants temporarily halted at the Barrancabermeja refinery given the COVID-19 pandemic and decrease in product demand, (iii) the consolidation of Invercolsa during the entire year of 2020 versus two months in 2019 and (iv) higher labor expenses due certain of the segment's employees choosing to accept the voluntary retirement plan in Ecopetrol, previously mentioned.

In 2019, operating expenses before the impairment of non-current assets decreased by 80.1% as compared to 2018, mainly due to the gain of COP\$1,048,924 recognized when we obtained control of Invercolsa in November 2019.

In 2020, we recognized an impairment loss of non-current assets in this segment totaling COP\$781,528 million, as compared to a reversal of impairment of COP\$452,163 million in 2019. The impairment loss we observed in 2020 is primarily the result of (i) an impairment loss of COP \$440,525 million attributable to the Cartagena refinery, which in turn was mainly due to lower refining margins; and (ii) an impairment loss of COP \$341,000 million attributable to the Barrancabermeja Refinery Modernization Plan, taking into account progress in the technical analysis of the project.

In 2019, we recognized a reversal of impairment of non-current assets in this segment totaling COP\$452,163 million, as compared to impairment losses of COP\$984,704 million in 2018. The reversal we observed in 2019 is primarily the result of net effect between i) a reversal of impairment of the Cartagena Refinery was mainly due to a lower discount rate associated with external market factors, ii) an impairment loss in Bioenergy which was generated primarily due to the decrease in availability of sugar cane, partially offset by an improvement in the projection of the realization price of ethanol and a decrease in the discount rate, and iii) an impairment loss associated with the modernization plan for the Barrancabermeja refinery, considering the state of the technical alternatives analysis of possible future increases in conversion.

As mentioned earlier, the refining segment is highly sensitive to changes in product prices and feedstock in the international market, discount rate, refining margins, changes in environmental regulations and cost structure and the level of capital expenditures.

The refining and petrochemicals segment recorded net loss attributable to owners of Ecopetrol of COP\$2,848,511 million in 2020 compared to a net income of COP\$117,708 million in 2019 and a net loss of COP\$1,973,075 million in 2018.

4.7 Liquidity and Capital Resources

Our principal sources of liquidity in 2020 were: (i) cash flows from our operations amounting to COP\$9,186,704 million, (ii) cash flow from financing activities, mainly from the proceeds from new issuances of debt instruments, net of related payments of principal and interest, which totaled COP\$6,455,835 million and (iii) cash flows from net sales of securities investment portfolio amounting to COP\$2,107,856 million.

Our main uses of cash in 2020 were: (i) COP\$11,116,861 million in capital expenditures, which included investments in property, plant and equipment, natural and environmental resources and intangibles, (ii) dividend payments amounting to COP\$8,734,351 million, which included dividends of COP\$7,369,499 million to Ecopetrol's shareholders, including the Nation, and dividends paid to the non-controlling shareholders of our subsidiaries totaling COP\$1,364,852 million, and (iii) COP\$350,539 million in lease payments. For more information regarding our debt, see the section Financial Review—Financial Indebtedness and Other Contractual Obligations.

4.7.1 Review of Cash Flows

Cash from operating activities

Net cash provided by operating activities decreased by 66.8% in 2020 as compared to 2019, mainly as a result of:

- i) A 45.4% decrease in our operating income before depreciation, depletion and amortization (DD&A) and impairment of non-current assets primarily due to (i) lower sales volumes associated with the decrease in demand and weighted average sale prices which in turn primarily reflects the effects of the COVID-19 pandemic as previously discussed, and (ii) expenses in 2020, such as the voluntary retirement plan we offered certain of our employees and aid granted to support Colombian Government efforts to mitigate the health and other social impacts of the COVID-19 pandemic. This decrease was partially offset by (i) lower operational costs given the decrease in our activity levels generally, (ii) new businesses integrated into the Ecopetrol Group's consolidated results, such as Invercolsa and Permian, and our increased participation in the Guajira association contract and (iii) good results of our performance of subsidiaries that are not sensitive to the Brent price, such as Esenttia and Cenit.
- ii) Higher working capital expenditures needs mainly due to the decrease in operating activity generated by the COVID-19 pandemic, which derived into lower accounts payable with suppliers and an increase in tax assets given that income tax advances did not offset charged taxes as Ecopetrol S.A. will be taxed at the presumptive income tax rate given its decreased income results for 2020. The factor mentioned was partially offset by a decrease in accounts receivable and inventories, which in turn was due to the decrease in sales.

Net cash provided by operating activities increased by 23.3% in 2019 as compared to 2018, mainly as a result of:

- i) A 2.8% increase in our operating income before depreciation, depletion and amortization (DD&A) and impairment of non-current assets primarily due to i) higher levels of hydrocarbon production, ii) a record refining throughput of 374 mbd, similar to that of 2018, despite major scheduled maintenance for our units, iii) a solid performance of the midstream segment, which guaranteed operational continuity despite third-party damages to its infrastructure, iv) a successful commercial management that enabled us to materialize better oil spreads vs the Brent price and v) a favorable COP peso/U.S. dollar devaluation environment. This increase was partially offset by lower international crude and product prices.
- ii) Lower working capital expenditures needs mainly due to a decrease in accounts receivable from the FEPC and a lower payment in advance of the capital gains tax.

Cash used in investing activities

In 2020, net cash used in investing activities decreased by 15.0% as compared to 2019, mainly as a result of (i) a 20.5% decrease in investments in capital expenditures, mainly due to the work restrictions implemented to contain the cases of contagion of COVID-19 (under the concept of operational vital minimum), that was reflected in temporary closure of some wells and negatively affected our production. All the above primarily affected our capital expenditures in the Rubiales, Caño Sur, Casabe, Sur and Recetor assets as well as the Cartagena refinery, (ii) blockages by the communities in the Rubiales, Apiay and Tibu fields, and (iii) a decrease in our securities investment levels in order to conserve liquidity given the lower generation of cash from the operations.

In 2019, net cash used in investing activities increased by 15.1% as compared to 2018, mainly as a result of (i) a 65.2% increase in investments in capital expenditures, mainly due to a drilling campaign which was concentrated in the Castilla, Rubiales, Chichimene, Suria, Casabe, Yarigui-Cantagallo and La Cira-Infantas fields and inorganic investment from international agreements such as the strategic alliance with OXY in the US Permian basin. This increase was partially offset by a decrease in our investment portfolio to support our capital expenditures and dividends received from affiliates.

Cash used in financing activities

Net cash used in financing activities decreased by 84.7% in 2020, as compared to 2019, due to (i) an increase in cash from borrowings, net of related payments of principal and interest, of COP\$6,455,835 million as compared to a decrease of COP\$3,002,977 million in 2019, which in turn primarily reflects Ecopetrol S.A. entering into committed credit lines in an aggregate principal amount of US\$665 million and issuing an SEC-registered bond in an aggregate amount of US\$2,000 million in 2020, (ii) a COP\$5,132,678 decrease in dividend payments in 2020 as compared to 2019.

Net cash used in financing activities increased by 8.7% in 2019, as compared to 2018, due to (i) an increase in dividend payments to the shareholders of Ecopetrol (COP\$12,910,611 million) and in dividend payments made by certain of our subsidiaries to their non-controlling shareholders (COP\$956,418 million), (ii) payments of local and foreign currency-denominated loans totaling COP\$3,002,977 million and (iii) COP\$300,326 million in lease payments.

4.7.2 Capital Expenditures

Our consolidated capital expenditures in 2020, 2019 and 2018 were COP\$11,116,861 million, COP\$13,979,141 million and COP\$8,460,426 million, respectively. These investments were distributed by business segment on average, for the past three years as follows: 83.5% for the exploration and production segment, 8.1% for refining and petrochemicals and 8.4% for the transportation and logistics segment. See Note 33.3 to our consolidated financial statements for more detail about capital expenditures by segment.

Our investment plan approved for 2021 is a range of between US\$3,500 million and US\$4,000 million. See the section entitled Strategy and Market Overview—2021 Investment Plan for further information and implicit Brent prices.

The resources required for the investment plan can be funded through internal cash generation and cash surpluses existing at the beginning of the year.

4.7.3 Dividends

On March 26, 2021, our shareholders at the ordinary General Shareholders Assembly approved a distribution of ordinary dividends for the fiscal year ended December 31, 2020 amounting to COP\$698,984 million, or COP\$17 per share, based on the number of outstanding shares as of December 31, 2020. The payment date will be April 22, 2021 for 100% of shareholders.

In 2020, we paid dividends of COP\$7,369,499 million to Ecopetrol's shareholders, including the Nation, and dividends paid to non-controlling shareholders of our subsidiaries totaling COP\$1,364,852 million.

In 2019, we paid dividends of COP\$12,910,611 million to Ecopetrol's shareholders, including the Nation, and dividends paid to non-controlling shareholders of our subsidiaries totaling COP\$956,418 million.

In 2018, we paid dividends of COP\$3,659,373 million to Ecopetrol's shareholders, including the Nation, and dividends paid to non-controlling shareholders of our subsidiaries totaling COP\$768,328 million.

4.8 Summary of Differences between Internal Reporting (Colombian IFRS and IFRS)

We prepare our interim and annual statutory financial information in accordance with our internal reporting policies, which follow Colombian IFRS and differ in certain significant aspects from IFRS. The following table sets forth our consolidated net income and equity for years ended December 31, 2020, 2019 and 2018, in accordance with Colombian IFRS and IFRS:

Table 57 – Consolidated Net Income and Equity

	For the year ended December 31,			% Change	
	2020	2019	2018	2020/2019	2019/2018
	(COP\$ Million)				
Net income attributable to owners of Ecopetrol (IFRS)	1,586,677	13,744,011	11,381,386	(88.5)	20.8
Cash flow hedge for future company exports	(122,375)	(419,275)	(471,314)	(70.8)	(11.0)
Exchange rate effects on tax bases – Deferred tax	223,775	(73,253)	646,333	(405.5)	(111.3)
Net income Attributable to owners of Ecopetrol (Colombian IFRS)	1,688,077	13,251,483	11,556,405	(87.3)	14.7
Net Equity (IFRS)	53,499,363	58,231,628	57,107,780	(8.1)	2.0
Cash flow hedge for future company exports	-	(10,099)	(20,792)	(100.0)	(51.4)
Exchange rate effects on tax bases – Deferred tax	2,319,907	2,122,593	2,217,450	(9.3)	(4.3)
Net Equity (Colombian IFRS)	55,819,270	60,344,122	59,304,438	(7.5)	1.8

As noted above, certain differences exist between our net income and equity as determined in accordance with our internal reporting policies, which follow Colombian IFRS, which are used for management reporting purposes, as presented in the business segment information, and our net income and equity as determined under IFRS, as presented in our consolidated financial statements.

The primary differences between Colombian IFRS and IFRS as they apply to our results of operations are summarized below:

Cash flow hedge for future company exports. In September 2015, in order to hedge the effect of exchange rate volatility on Ecopetrol's foreign currency debt, Ecopetrol's Board of Directors approved a cash flow hedge for future crude oil exports. According to IAS 39 – Financial Instruments, Ecopetrol implemented this hedge beginning on October 1, 2015, the date on which it formally completed the related hedging documentation.

Under Colombian IFRS, the General Accounting Office of the Nation (CGN for its Spanish acronym) issued Resolution 509, which allows companies to apply hedge accounting for non-derivative financial instruments from any date within the transition period or the first period of application of International Accounting Standards in Colombia, even if such company has not yet formally documented the hedging relationship, the objective or the risk management strategy. Under these rules, Ecopetrol applied cash flow hedge accounting from January 1, 2015 in its financial statements under Colombian IFRS.

As a result of this accounting policy difference, for the year ended December 31, 2020, our net income as reported under IFRS was COP\$122,375 million higher than our net income as reported under Colombian IFRS.

Exchange rate effects on tax bases – Deferred tax. According to IAS 12.41, companies with a U.S. dollar functional currency and profit or tax loss in Colombian Pesos are required to recognize deferred taxes attributable to the difference between the carrying amounts of non-monetary assets in their financial statements and their respective tax bases converted from Colombian Pesos to U.S. dollars using the exchange rate on the closing date. The effect of the temporary difference is charged to profit and losses without a cash outflow expected in the future. Under local accounting principles (The General Accounting Office opinion No. 20162000000781 dated January 18, 2016), the result attributable to the aforementioned difference in accounting policies does not generate any deferred taxes.

Ecopetrol's functional currency is the Colombian Peso and it consolidates some subsidiaries whose functional currency is the U.S. dollar but who settled their taxes in Colombian Pesos. As a result of the application of paragraph 41 – IAS 12, such subsidiaries are required to calculate deferred taxes under IFRS.

As a result of this accounting policy difference, for the year ended December 31, 2020, our net income attributable to owners of Ecopetrol as reported under IFRS was COP\$223,775 million lower than our net income attributable to owners of Ecopetrol as reported under Colombian IFRS.

The application of IAS12.41 also generated adjustments to our goodwill and investments in companies impairments of COP\$12,435 million in 2020, COP\$14,865 million in 2019 and COP\$22,030 million in 2018 in connection with our purchase of subsidiaries whose functional currency is the U.S. dollar as well as adjustments to our revenue from the equity method of COP\$12,091 million in 2020, COP\$12,630 million in 2019 and COP\$11,316 million in 2018 in connection with our associates and joint ventures whose functional currency is the U.S. dollar.

As a result of these accounting policy differences described above, for the year ended December 31, 2020, we reported net income attributable to the owners of Ecopetrol under IFRS of COP\$1,586,677 million as opposed to a net income attributable to the owners of Ecopetrol of COP\$1,688,077 million reported under Colombian IFRS for the same period. For the year ended December 31, 2019, we reported net income attributable to the owners of Ecopetrol under IFRS of COP\$13,744,011 million as opposed to a net income attributable to the owners of Ecopetrol of COP\$13,251,483 million reported under Colombian IFRS for the same period. For the year ended December 31, 2018, these same accounting differences led us to report net income attributable to the owners of Ecopetrol under IFRS of COP\$11,381,386 million as opposed to a net income attributable to the owners of Ecopetrol of COP\$11,556,405 million reported under Colombian IFRS for the same period.

4.9 *Financial Indebtedness and Other Contractual Obligations*

As of December 31, 2020, we had outstanding consolidated indebtedness of COP\$44.5 trillion, which corresponded primarily to the following long-term transactions:

Table 58 – Consolidated Financial Indebtedness

Company	Type	Initial Date	Original Amount	Maturity	Interest Rate	Amortization
Ecopetrol S.A.	Bonds	September 18, 2013	US\$ 1,300 million	September 18, 2023	5.875%	Bullet
		September 18, 2013	US\$ 850 million	September 18, 2043	7.375%	Bullet
		May 28, 2014	US\$ 2,000 million	May 28, 2045	5.875%	Bullet
		September 16, 2014	US\$ 1,200 million	January 16, 2025	4.125%	Bullet
		June 26, 2015	US\$ 1,500 million	June 26, 2026	5.357%	Bullet
		June 15, 2016*	US\$ 500 million	September 18, 2023	5.875%	Bullet
		December 1, 2010	COP\$ 284,300 million	December 1, 2040	Floating	Bullet
		August 27, 2013	COP\$ 168,600 million	August 27, 2023	Floating	Bullet
		August 27, 2013	COP\$ 347,500 million	August 27, 2028	Floating	Bullet
		August 27, 2013	COP\$ 262,950 million	August 27, 2043	Floating	Bullet
		April 29, 2020	US\$ 2,000 million	April 29, 2030	6.875%	Bullet
		December 30, 2011**	US\$ 440 million	December 20, 2025	Floating	Semi-annual
		April 15, 2020	US\$ 665 million	September 20, 2023	Floating	Semi-annual
		December 30, 2011**	US\$ 2,650 million	December 20, 2027	Fixed	Semi-annual
Invercolsa & Subsidiaries	Bank Loans	December 30, 2011**	US\$ 100 million	December 20, 2027	Floating	Semi-annual
		December 30, 2011**	US\$ 97 million	December 20, 2027	Fixed	Semi-annual
		December 30, 2011**	US\$ 210 million	December 20, 2027	Floating	Semi-annual
		Various	US\$ 377,202 million	Various	Fixed	Fixed
		Various	US\$ 4,471 million	Various	Floating	Various
		July 14, 2020	US\$ 500 million	July 14, 2027	4.000%	Bullet
		July 5, 2012	COP\$ 2.1 trillion	July 5, 2024	Floating	Quarterly
		November 5, 2015	COP\$ 308,221 billion	November 4, 2032	Floating	Monthly
Ocensa	Bond	July 14, 2020	US\$ 500 million	July 14, 2027	4.000%	Bullet
Oleoducto Bicentenario	Bank Loan	July 5, 2012	COP\$ 2.1 trillion	July 5, 2024	Floating	Quarterly
ODL	Lease	November 5, 2015	COP\$ 308,221 billion	November 4, 2032	Floating	Monthly

* Reopening of bond due to 2023.

** Debt originally obtained by Reficar for the Refinery modernization and voluntarily assumed by Ecopetrol. In prior annual reports on form 20-F, there was a typographical error in respect of the original amount outstanding on such bank loan. It was listed as US\$321 million and the correct amount as listed in the table above is US\$440 million.

The Colombian Superintendence of Finance, through Resolution 1379 of October 10, 2019, authorized the renewal of the term of the Issuance and Placement Program of Internal Debt Bonds and Commercial Papers of the Company for three (3) additional years, until October 10, 2022.

Further, the Ministry of Finance and Public Credit of Colombia, through Resolution 0600 of February 18, 2020, authorized the Company to structure the issuance and placement of bonds in the international capital markets for up to two billion US dollars (US\$2,000,000,000).

These authorizations themselves do not constitute an approval for the issuance of securities or any financing transaction.

The short and long term debt transactions executed in 2020 were as follows:

- Between March and April 2020, Ecopetrol executed short term debt transactions (trade finance and short term loans) in Colombian pesos and US dollars, for an aggregate of COP\$ 775 billion and US\$ 221.5 million, respectively (totalling COP\$ 1.7 trillion according to the COP\$/US\$ exchange rate as of the day of execution of each transaction). All loans were prepaid on September 2020.
- On April 15, 2020, Bank of Nova Scotia and Mizuho Bank disbursed an aggregate amount of US\$ 665 million (COP\$ 2.3 trillion according to the COP\$/US\$ exchange rate as of December 31, 2020) under a committed credit facility due on September 2023.
- On April 24, 2020, Ecopetrol S.A issued 6.875% Notes due 2030 in an aggregate amount of US\$ 2 billion (COP\$ 6.9 trillion according to the COP\$/US\$ exchange rate as of December 31, 2020) in an SEC-registered transaction. The notes were listed on the NYSE.
- On July 14, 2020, Ocensa issued 4% Notes due 2027 in an aggregate amount of US\$ 500 million (COP\$ 1.7 trillion according to the COP\$/US\$ exchange rate as of December 31, 2020) in an SEC-registered transaction. The notes were listed on the Luxembourg Stock Exchange. The proceeds were used to redeem, on September 18, 2020, Ocensa's bonds originally due on May 7, 2021.

Ecopetrol did not incur any short-term or long-term bank loans or bonds in 2019.

Contractual Obligations

We enter into various commitments and contractual obligations that may require future cash payments. The following table summarizes our contractual obligations as of December 31, 2020.

Table 59 – Our Contractual Obligations

COPS Millions	Payments due by period				
	Total	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years
Employee Benefit Plan	33,222,962	1,450,763	3,017,049	3,130,406	25,624,744
Contract Service Obligations	16,030,925	5,155,544	3,024,772	4,057,953	3,792,655
Operating Lease Obligations	211,661	155,862	37,506	14,550	3,742
Natural Gas Supply Agreements	12,157,544	5,027,100	3,429,898	2,678,858	1,021,688
Purchase Obligations	2,663,077	843,285	576,356	660,593	582,843
Energy Supply Agreements	1,496,929	4,598	90,733	233,353	1,168,245
Capital Expenditures	13,573,859	3,806,896	5,566,521	2,178,127	2,022,316
Build, Operate, Maintain and Transfer Contracts (BOMT)	469,712	81,101	139,646	107,041	141,925
Capital (Finance) Lease Obligations	308,125	34,891	63,571	59,798	149,865
Financial Sector Debt	9,499,662	1,324,669	5,133,819	2,339,691	701,483
Bonds	34,635,738	-	6,379,460	4,080,000	24,176,278
Total	124,270,194	17,884,709	27,459,331	19,540,370	59,385,784

Note: For the presentation of the contractual obligations in this annual report, contractual obligations beyond the current year represent the expected amount to be committed by us according to our framework contracts. Previously, we were reporting our obligations beyond the current year based on individual orders instead of framework contracts. The implementation of this methodology has resulted in a material increase of our commitments from what was previously reported.

4.10 Off Balance Sheet Arrangements

As of December 31, 2020, we did not have off-balance sheet arrangements of the type that is required to be disclosed under Item 5.E of Form 20-F.

4.11 Trend Analysis and Sensitivity Analysis

Ecopetrol updated its Business Plan on February 23, 2021. See the section entitled Strategy and Market Overview—Our Corporate Strategy—2021 – 2023 Business Plan for a discussion of the trends recognized in the development of that plan.

Sensitivity Analysis

Sensitivity Analysis of Reserves

The following table provides information about the sensitivity analysis conducted on our oil and gas reserves as of December 31, 2020, considering ICE Brent crude oil prices that reasonably reflect management's view of crude oil prices given prevailing market conditions, and management portfolio costs.

Table 60 – Sensitivity Analysis of Reserves

COPS Millions	Oil and NGL (mmb)	Natural Gas (bcf)	Total Oil and Gas (mmboe)
Reserves as of December 31, 2020	1,068.0	2,466.0	1,501.0
Sensitivity Scenario	1,167.0	2,509.0	1,607.0
Difference (mmb)	99.0	43.0	106.0
Difference (%)	0.09	0.02	0.07

The conversion rate used is 5,700 cf = 1 boe.

Assumptions for the Sensitivity Analysis of Reserves

The sensitivity analysis assumes a constant ICE Brent price of US\$ 46 per barrel in 2021, between US\$ 55 and US\$ 58 per barrel in the period 2022-2025, and between US\$61 and US\$68 onwards, and costs of management portfolio.

The base scenario on which our sensitivity analysis is made corresponds to 85% of our oil, NGL and natural gas reserves, as of December 31, 2020, as presented elsewhere in this annual report.

Other variables such as the operating costs, capital costs and portfolio price remain unchanged for purposes of the analysis.

Sensitivity Analysis of our Results

The following table provides information about the sensitivity of our results as of December 31, 2020, due to variations of US\$1 in the price of ICE Brent crude and of 1% in the COPS/US\$ exchange rate.

Table 61 – Sensitivity Analysis of our Results

COPS Million	Income Statement 2020	Income Statement Case ICE Brent ⁽¹⁾ +US\$1	Difference Between Real 2020 and Case ICE Brent	Income Statement Case TRM ⁽²⁾ +1%	Difference Between Real 2020 and Case TRM
Revenue	50,223.39	51,298.64	1,075.25	50,710.48	487.09
Cost of sales	37,567.47	37,963.58	396.11	37,727.33	159.86
Gross Income	12,655.92	13,335.06	679.14	12,983.15	327.23
Operating expenses	4,841.00	4,841.00	-	4,841.00	-
Impairment of non-current assets	633.16	633.16	-	633.16	-
Operating income	7,181.76	7,860.90	679.14	7,508.99	327.23
Finance results, net	(2,481.59)	(2,481.59)	-	(2,481.59)	-
Share of profit of associates and joint ventures	76.34	76.34	-	76.34	-
Income before income tax	4,776.51	5,455.65	679.14	5,103.74	327.23
Income Tax	(2,038.66)	(2,328.52)	(289.86)	(2,178.32)	(139.66)
Net Income	2,737.85	3,127.13	389.28	2,925.42	187.57

(1) ICE Brent = US\$43 per barrel

(2) Exchange rate (TRM) = COPS 3,693/US\$ 1.00

Assumptions for the Sensitivity Analysis of our Results

Our sensitivity analysis is based on the Consolidated Statement of Profit or Loss for 2020, as presented elsewhere in this annual report.

The sensitivity of the ICE Brent price index is in reference to an increase of US\$1 per barrel of crude oil in the average ICE Brent reference price based on a 366-day year for 2020. Prices assumed correspond to realized prices for crude oil, natural gas and refined products for 2020, adjusted to account for the differences between such realized prices and the ICE Brent reference price.

The sensitivity of our results to changes in the exchange rate is in reference to a 1% average depreciation of the Colombian Peso against the U.S. dollar during 2020. Prices are the realized prices of crude oil, natural gas and refined products in 2020 and are expressed for the sensitivity using the adjusted exchange rate (*i.e.* a 1% average depreciation of the Colombian Peso against the U.S. dollar during 2020).

The income tax for each of our sensitivity analyses (price of ICE Brent and COP\$/US\$ exchange rate) is estimated using the effective corporate tax rate of 43% for 2020.

This sensitivity analysis keeps everything constant. In the case of significant variations of the ICE Brent price, Ecopetrol will perform interventions in its operating expenditures.

The table below sets forth the line items that are being affected by the variation on the reference prices or the average exchange rate.

Table 62

VARIATION ON ICE BRENT REFERENCE PRICE		VARIATION ON AVERAGE EXCHANGE RATE	
		REVENUE	
Sales of crude oil		Sales of crude oil	
Sales of refined products		Sales of refined products	
Sales of natural gas		Sales of natural gas	
		COST OF SALES	
Local purchases from business partners		Local purchases from business partners	
Local purchases of hydrocarbons from the ANH		Local purchases of hydrocarbons from the ANH	
Local purchases of natural gas		Local purchases of natural gas	
Imports of products		Imports of products	

5. Risk Review

5.1 Risk Factor Summary

The following is a summary of the principal risks we face:

1. Our crude oil and natural gas reserve estimates involve some degree of uncertainty and may prove to be incorrect over time.
2. Achieving our long-term growth depends on our ability to execute our strategic plan— specifically, the discovery and/or successful development of additional reserves and our capacity to adapt our business to the transition to a low carbon economy and climate change.
3. Our business depends substantially on international prices for crude oil and refined products.
4. Changes in the Colombian Peso/U.S. dollar exchange rate could have an adverse effect on our financial condition and results of operations.
5. Increased competition from local and foreign oil companies may have a negative impact on our ability to gain access to additional crude oil and natural gas reserves in Colombia and abroad.
6. If operational risks to which we are exposed in Colombia or overseas materialize, the health and safety of our workforce, the local community and the environment may be affected. In addition, we may suffer a disruption or shutdown of our operational activities.
7. Our involvement in deep-water drilling either as direct operator or in conjunction with our business partners involves risks and costs, which may be out of our control.

8. We are exposed to the credit, political and regulatory risks of our customers.
9. Our ability to access the credit and equity capital markets on favorable terms to obtain funding to finance our operations or refinance our debt maturities.
10. We may be exposed to increases in interest rates, thereby increasing our financial costs.
11. Our interest rate expense may be subject to uncertainty associated with the replacement or reform of benchmark indices.
12. Our current and planned investments and exploration activities outside Colombia are exposed to political and economic risks.
13. Our future performance depends on the successful selection, development and deployment of new technologies and the knowledge to operate, maintain and improve them.
14. Our performance could be negatively affected by the lack of skilled employees to execute our business strategy.
15. If the strategic plans associated to natural gas and NGL failed to yield the expected results, our operations may not be able to keep pace with the increasing domestic demand for these products.
16. Our operations could be affected by reactions of labor unions, social organizations, communities and contractors to Colombia's political and social environment, environmental and climate change concerns and organizational changes.
17. Our activities may be interrupted or affected by external factors, such as abnormal weather conditions and natural disasters.
18. Our business operations and financial condition could be negatively affected by the COVID-19 or other pandemic diseases and health incidents.
19. Our operations, including our activities in areas classified as indigenous reserves and Afro-Colombian lands, are subject to opposition from members of various communities.
20. We have made significant investments in acquisitions and divestments and we may not realize the expected value.
21. We might be required to provide financial support to our subsidiaries in Colombia or abroad.
22. Ongoing Colombian State control entities investigations regarding our subsidiary Reficar and our former subsidiary Bioenergy could adversely affect us.
23. Our results may be affected by the performance of our suppliers, our business partners or their third-party service providers.
24. Our insurance policies do not cover all liabilities and may not be available for all risks.
25. New trends in the insurance sector in the face of climate change may bring additional costs or create new conditions to be addressed by our Corporate Insurance Program
26. A failure in our information technology systems or cyber security attacks may adversely affect our financial results.
27. We are exposed to behaviors incompatible with our ethics and compliance standards.
28. The reliability and capacity of national power supply systems may affect or limit the continuity of our operations or limit growth.
29. Rising water production levels may affect or constrain our crude oil production.

Risks Related to Colombia's Political and Regional Environment

30. The worldwide economic effects of the outbreak and economic shutdown caused by the COVID-19 pandemic is adversely affecting Colombia's economy, and the impact could be material.
31. The Colombian government could seize or expropriate Ecopetrol's assets under certain circumstances for fair compensation.
32. Colombia has experienced internal security issues that have had or could have a negative effect on the Colombian economy and on us.
33. Despite the peace agreement between the Colombian government and the FARC and the peace negotiation process attempts with the National Liberation Army (the ELN), some illegal and terrorist activities of guerrilla groups or their members may continue.
34. There have been certain events in Colombia and abroad, which have resulted in political tensions between Colombia and some of its neighboring countries.

35. The investment climate in Colombia, may be less stable than the prevailing economic conditions and investment climate in developed countries.
36. Our operations might be affected by rising climate change and energy transition concerns.
37. New or higher taxes resulting from changes in tax regulations or the interpretation thereof in Colombia could adversely affect our results of operations and financial condition.

Legal and Regulatory Risks

38. Our operations are subject to extensive regulation.
39. Our operations might be affected by rising climate change and energy transition regulatory developments.
40. New or higher taxes resulting from changes in tax regulations or the interpretation thereof in Colombia could adversely affect our results of operations and financial condition.
41. We may incur losses and spend time and money defending pending lawsuits and arbitrations and responding to administrative investigations.

Risks Related to Our ADSs

42. Holders of our ADSs may encounter difficulties in protecting their interests.
43. Our ADSs holders may be subject to restrictions on foreign investment in Colombia
44. Holders of our ADSs may not be able to effect service of process on us, our directors or executive officers within the United States, which may limit your recovery in any foreign judgment you obtain against us.
45. The protections afforded to minority shareholders in Colombia are different from those in the United States, and may be difficult to enforce.
46. ADRs do not have the same tax treatment as other equity investments in Colombia.
47. Judgments of Colombian courts with respect to our ADSs will be payable only in Colombian Pesos.
48. The relative volatility and illiquidity of the Colombian securities markets may substantially limit our investors' ability to sell our ADSs at the price and time they desire.
49. We are not required to disclose as much information to investors as a U.S. issuer is required to disclose.

Risks Related to the Controlling Shareholder

50. Our controlling shareholder's interests may be different from those of certain minority shareholders.

5.2 Risk Factors

The risks discussed below could have a material adverse effect, separately or in combination, on our business's operating results, cash flows, liquidity and financial condition. Investors should carefully consider these risks.

5.2.1 Risks Related to Our Business

This section describes the most significant potential risks to our business.

Our crude oil and natural gas reserve estimates involve some degree of uncertainty and may prove to be incorrect over time, which could adversely affect our ability to generate revenue.

Reserves estimates are prepared using generally accepted geological and engineering evaluation methods and procedures. Estimates are based on geological, topographical and engineering facts. Actual reserves and production may vary materially from estimates shown in this annual report, and downward revisions in our reserve estimates could lead to lower future production which could affect our results of operations and financial condition.

Hydrocarbon reserves presented in this annual report were calculated in accordance with SEC regulations. As required by those regulations, reserves were valued based on the unweighted average of closing prices for the first day of each month in the 12-month periods ended December 31, 2020, 2019 and 2018, as well as other conditions in existence at those dates. The average of closing prices of ICE Brent crude oil for the first day of each month in the 12-month periods was US\$ 72.2/Bbl in 2018, US\$ 63/Bbl in 2019 and US\$ 43/Bbl in 2020. In 2020, the Company recognized a decrease in oil and gas proven reserves of 6.5% as compared to 2019, to 1,770 mmboe in 2020 from 1,893 mmboe in 2019. In 2019, the Company recognized an increase in oil and gas proven reserves of 9.6% as compared to 2018, to 1,893 mmboe in 2019 from 1,727 mmboe in 2018. For more information, see the section Business Overview—Exploration and Production—Reserves.

Furthermore, at least once a year, or more frequently if the circumstances require, the Company ascertains whether there are indicators of impairment to its assets or cash-generating units (CGUs) due to the difference between the carrying amount of such assets or CGUs against to their recoverable amounts, using reasonable assumptions, based on internal and external factors, which reflect market conditions. The recoverable amount is considered to be the higher of the fair value less costs of disposal and value in use, based on the free cash flow method, discounted at the Weighted Average Cost of Capital (WACC). Whenever the recoverable amount of an asset or CGU is lower than its net carrying amount, such amount is reduced to its recovery amount, recognizing a loss for impairment as an expense in the consolidated statement of profit or loss. External and internal sources of information may indicate that an impairment loss recognized for an asset, other than goodwill, may no longer exist or may have decreased, in this case, the reversal is recognized as an impairment recovery in the consolidated statement of profit or loss.

In 2020, Ecopetrol recognized impairment losses of non-current assets of COP\$ 633,156 million which corresponds to the net result of:

- An impairment of non-current assets in the exploration and production segment mainly due to the decrease in crude oil price forecast in the short and long term.
- An impairment of non-current assets in the refining and petrochemicals segment, primarily related to the lower refining margins at the Cartagena Refinery and the Barrancabermeja Refinery Modernization Plan, considering the progress in technical analysis of the project.
- A reversal of impairment of non-current assets in the transportation and logistics segment, primarily as a result of a recovery in transported volumes in 2020 through: (i) South CGU, which includes the TransAndino Pipeline – OTA and the Port of Tumaco, and (ii) North CGU, which includes the Banadía–Ayacucho’s pipeline, part of Caño Limón-Coveñas system.

Any significant change in estimates and judgments could have a material effect on the quantity and present value of our proved reserves and subsequently on the recognition or recovery of impairment charges. Changes to estimations of reserves are applied prospectively to the amounts of depreciation, depletion and amortization charged and, consequently, the carrying amounts of exploration and production assets.

In order to assess the possible impact of current expected oil price scenarios and market conditions, as well as of further developments driven by the economic environment for the oil and gas industry, the Company has performed a sensitivity analysis over its proved reserve balance as of December 31, 2020. Based on these calculations, assuming an average price per barrel of ICE Brent price of US\$ 46/Bl in 2021, US\$ 55/Bl and US\$ 58/Bl between 2022 and 2025, and between US\$ 61/Bl and US\$ 68/Bl onwards, Ecopetrol could recognize an increase in oil and gas proved reserves of approximately 7%. This analysis takes into account Ecopetrol’s estimates and expectations regarding the main assumptions used in its proven reserve calculation, which final actual result may fluctuate and differ substantially from those provided herein due to several factors outside of the control of the Company. For additional information see the section [Financial Review—Trend Analysis and Sensitivity Analysis](#).

On the contrary, any upward revision in our estimated quantities of proved reserves would indicate higher future production volumes, which could result in lower expenses for depreciation, depletion and amortization for properties to which we apply the units of production method for calculating these expenses. These lower expenses, and any higher revenues as a result of actual production volumes and realized prices, could benefit our results of operations and financial condition.

Achieving our long-term growth depends on our ability to execute our strategic plan — specifically, the discovery and/or successful development of additional reserves and our capacity to adapt our business to the transition to a low carbon economy and climate change.

Our long-term growth objectives depend largely on our ability to develop the reserves recovery potential associated with existing fields and to discover and/or acquire new reserves, and in turn develop them successfully. Our exploration activities expose us to the inherent geological and drilling risks including the risk of not discovering commercially viable crude oil or natural gas reserves, and the risk that some exploratory wells initially budgeted for may be drilled at a later stage or not be drilled at all. Despite the effort we make to control costs associated with drilling, these are often uncertain, and numerous factors beyond our control may cause drilling operations to be curtailed, delayed or cancelled.

Our ability to add and develop reserves also depends on our capacity to structurally reduce costs to maintain the profitability of oil fields already being exploited without compromising infrastructure integrity and HSE performance. Additionally, our strategy envisioned the exploration and development of unconventional reservoirs in Colombia, by using fracking technology. See the section [Strategy and Market Overview—2021 – 2023 Business Plan](#). However, the implementation of this strategy depends, among others, on the final outcome of the regulatory framework under implementation by the Colombian Government, the environmental license required for the PPII, and the results of the scientific information to be collected.

If we are unable to achieve expected recovery factors in our existing fields, or successfully discover and develop additional reserves, or if we do not acquire properties having proved reserves, our reserves portfolio will decline. Failure to secure additional reserves may impede us from achieving or maintaining production targets, and may have a negative impact on our results of operations and financial condition.

Furthermore, we are subject to risks related to the transition to a low carbon economy and to climate change. In terms of our physical risks, these are related to the exposure we have to Colombia's current climate conditions that might affect water availability and increase the exposure of our assets and operations to potential damages. These conditions could result, among others, in water shortages, floods, fires, storms, and hurricanes, rising sea levels that can change in frequency and intensity because of climate change. Extreme weather events could result in damages to our assets and negatively affect our operations and financial condition.

In terms of energy transition risks, we face risks related to our capacity to implement measures to reduce and offset carbon and methane emissions, our adaptation to climate variability and climate change, regulatory risks related to the new climate change regulations implemented in Colombia, such as the carbon tax in place since 2017, the implementation of an emissions trading system (ETS) expected to be implemented in 2022, the updated nationally determined contribution (NDC), and the oil & gas industry's climate change plan that includes new national mitigation and adaptation measures. These changes could lead to increases in our costs and investments in the short term (Ecopetrol has already incurred in costs related with these regulations and it is expected that continuing to comply with this evolving regulatory landscape will bring additional costs and investments for the Company in the short term). See the section Legal and Regulatory Risks - *[Our operations might be affected by rising climate change and energy transition regulatory developments](#)*.

Additionally, we face the risk of having stranded assets across our business segments. Specifically, we define a stranded asset as an asset or investment that loses its capacity to create economic return before ending its life cycle due to the changes brought about by the low carbon energy transition. Stranded asset risk is measured through a stranded asset risk index methodology that takes into account three risk elements: market (increasing uncertainty in price, accelerated peak oil demand); sustainability (reduced probability of developing an asset because of less community and society support to fossil fuels developments, increased pressure from investors to produce cleaner energies, regulatory changes), and capability (lack of technological capabilities to produce in the short term). Assets that have a score over a threshold in this index are considered in high risk. As of the date of this annual report, the index has been applied to our upstream segment assets with the stranded risk evaluation still being developed in our midstream and downstream segments. Our analysis resulted in no stranded assets in our upstream segment, with the assets with the highest risk of becoming stranded being just initiating their development (either still in the exploratory stage or having just commenced production). While we have begun to implement a mitigation plan in respect of assets with a high risk of becoming stranded, such as prioritizing short cycle projects, starting projects earlier, making current production cleaner and more efficient, and divesting less strategic assets, we can offer no assurance that certain of our assets will not become stranded in the medium to long term.

In addition, our business growth and sustainability depend on our ability to manage our capital investments and operate efficiently, in accordance with our corporate strategy guidelines.

See the section [Strategy and Market Overview—Our Corporate Strategy](#) for a discussion of our strategic plan.

Our business depends substantially on international prices for crude oil and refined products. The prices for these products are volatile; a sharp decrease could adversely affect our business prospects and results of operations.

In 2020, approximately 94% of the revenues came from sales of crude oil, natural gas and refined products and 90% of the total volume sold of these products was indexed to international reference prices or benchmarks such as ICE Brent. Consequently, fluctuations in those international indexes have a direct effect on our financial condition and results of operations.

Prices of crude oil, natural gas and refined products have traditionally fluctuated as a result of a variety of factors including, among others, competition within the international oil and natural gas industry, long-term changes in the demand for crude oil, natural gas and refined products, notably associated to the transition to a low carbon economy, the economic policies in the United States, China and the European Union, regulatory changes, changes in global supply, inventory levels, changes in the cost of capital, adverse or favorable economic conditions, global financial crises, substitute sources of energy, development of new technologies, global and regional economic and political developments in the Organization of the Petroleum Exporting Countries (OPEC), the willingness and ability of the OPEC and its members to set production levels, local and global demand and supply for crude oil, refined products and natural gas, trading activity in oil and natural gas; weather conditions, natural events or disasters, which are changing in intensity and frequency due to climate change, and terrorism and global conflict. In addition, due to the disagreement on production cuts between the Organization of the Petroleum Exporting Countries (OPEC) and Russia, the OPEC and its capacity and decision to increase production levels to gain market share have impacted the international reference prices in the past.

The continuing spread of the coronavirus disease (COVID-19) continues to lead to periods of instability in the global economy, which in turn could continue to cause instability in crude oil, NGL, and gas demand and oil, NGL, and gas prices. Additionally, the level of global oil inventories caused by the COVID-19 pandemic has created surpluses for oil and may result in the cost of exploring for, developing, producing and transporting oil to go up due to surpluses created by the pandemic. The COVID-19 pandemic may further impact the prices of crude oil, natural gas and refined products as expectations about future commodity prices become unpredictable due to the inability to forecast the duration scope of impact of the pandemic. See [Our business operations could be disrupted by the COVID-19 or other pandemic disease and health events](#) for further information on the effects of the coronavirus pandemic.

When crude oil, refined products and natural gas prices are low, we earn less revenue and we generate lower cash flow and less income. Conversely, when crude oil, refined product and natural gas prices are high, we earn more and generate a larger amount of cash and net income. During 2020, our crude oil basket price was US\$ 34.4/BI versus US\$ 58.6/BI in 2019, the refined product basket price was US\$ 49.2/BI versus US\$ 69.8/BI in 2019; and the natural gas price was US\$ 24.3 per barrel equivalent in 2020 versus US\$ 23.7 per barrel equivalent in 2019. However, it is important to consider that the margin on refined products can result either in higher or lower margins due to a change in price of crude the same way gas prices can be impacted by local conditions, such as local demand and weather conditions.

In 2020, we had an impairment of non-current assets of COP\$633,156 million, as compared to COP\$1,762,437 million in 2019 and COP\$368,634 million in 2018. These impairments are an accounting effect that does not involve any inflow of resources and they are susceptible to reversion when the fair value of the asset is above its book value. For additional information about this impairment charges, see the section [Financial Review—Operating Results—Consolidated Results of Operations—Impairment of Non-Current Assets](#) and Note 18 to our consolidated financial statements.

A reduction of international crude oil prices could also result in a delay or a change in our capital expenditure plan, in particular delaying exploration and development activities, thereby delaying the development of reserves and affecting future cash flows. In order to maintain a profitable operation and preserve the cash flow of the Company at certain oil price levels, some of our producing fields may have to be closed or their operations temporarily suspended which would affect our production levels and expected revenues.

Changes in the Colombian Peso/U.S. dollar exchange rate could have an adverse effect on our financial condition and results of operations given the amount of U.S. dollar denominated debt held by the company and the fact that most of our revenues are derived from sales of products quoted in or with reference to U.S. dollars.

Most of our revenues are derived from sales of products quoted in or with reference to U.S. dollars. Therefore, when the Colombian Peso depreciates against the U.S. dollar, our revenues converted into Colombian Pesos, increase. Conversely, when the Colombian Peso appreciates against the U.S. dollar, our revenues decrease.

On the other hand, imported goods, oil services and the debt, which is mainly denominated in U.S. dollars, become less expensive when the Colombian Peso appreciates against the U.S. dollar and more expensive when the Colombian Peso depreciates against the U.S. dollar.

As of December 31, 2020, our U.S. dollar-denominated total aggregate principal amount was US\$ 12.3 billion, which we recognize in our consolidated financial statements at its amortized cost, which corresponds to the present value of cash flows, discounted at the effective interest rate. Out of this total, an aggregate principal amount of US\$ 11.8 billion relate to Ecopetrol S.A., whose functional currency is the Colombian Peso. Therefore, when the Colombian Peso depreciates against the U.S. dollar, Ecopetrol S.A. is exposed to an exchange rate loss. In contrast, when the Colombian Peso appreciates against the U.S. dollar, Ecopetrol S.A. is exposed to an exchange rate gain. Some of the Ecopetrol Group's affiliates have the U.S. dollar as functional currency and are not exposed to a material exchange rate risk resulting from fluctuations in the Colombian Peso against the U.S. dollar. On the asset side, when the financial statements of the Ecopetrol Group are consolidated, the exchange rate differential of the affiliates' assets and liabilities whose functional currency is the U.S. dollar is recognized directly in the equity, as part of other comprehensive income.

The U.S. dollar/Colombian Peso exchange rate has fluctuated during the last several years. On average, the Colombian Peso depreciated 12.46% in 2020, 10.98% in 2019 and 0.18% in 2018. Additionally, as of December 31, 2020, the Colombian Peso depreciated 4.74%; as of December 31, 2019, the Colombian Peso depreciated 0.84%; and as of December 31, 2018, the Colombian Peso depreciated 8.91%, in each case from year-end exchange in the previous year. In addition, given the effect of COVID-19 on the world's economies, the performance of the interest rate in the U.S., different global growth perspectives, commercial and political tensions in the biggest world economies, current and expected crude oil prices in the next few years and political uncertainty in Colombia, there is no clear view of how the U.S. dollar and the Colombian peso will behave in the medium to long-term. Given that markets are dealing with a great deal of uncertainty, it is expected that U.S. dollar movements will remain difficult to forecast.

A future depreciation in the exchange rate of the Colombian Peso against the U.S. dollar may affect our financial results when converted into Colombian Pesos, given our current net position in U.S. dollars, the fact that most of our revenues are collected in U.S. dollars and the portion of our U.S. dollar debt that is not designated as hedge instrument and the future debt we may acquire. Please see our sensitivity analysis on our results of operation to exchange rate fluctuations in the section Financial Review—Effect of Taxes, Exchange Rate Variation, Inflation and the Price of Oil on our Results—Exchange Rate Variation and in Note 30.1 to our consolidated financial statements.

Increased competition from local and foreign oil companies may have a negative impact on our ability to gain access to additional crude oil and natural gas reserves in Colombia and abroad.

We must bid for exploration blocks offered by the ANH in Colombia and similar authorities in other countries, which means we compete under the same conditions as other domestic and foreign oil and gas companies, and receive no special treatment. Our ability to obtain access to potential fields also depends on our ability for evaluating and selecting potential opportunities and to adequately bid for such opportunities.

We are also exposed to international competition as a result of our international exploratory activities. Currently, we are exploring in Brazil, Mexico and the United States, where we partner and compete with other oil and gas companies operating in those locations.

If we are unable to adequately compete with local and foreign oil companies, or if we cannot enter into joint ventures with market players having high potential exploration projects, our exploration activities may be limited. This could reduce our market share and, in turn, adversely affect our financial condition.

If operational risks to which we are exposed in Colombia or overseas materialize, the health and safety of our workforce, the local community and the environment may be affected. In addition, we may suffer a disruption or shutdown of our operational activities.

Our exploration, production, refining and transportation activities in Colombia and in the foreign countries in which we operate are subject to industry-specific operating risks, some of which, despite our internal procedures and adherence to industry best practices, are beyond our control. Our operations may be curtailed, delayed or cancelled due to adverse or abnormal weather conditions and natural disasters (mainly due to climate variability or climate change), blockages in the communities in which we operate, equipment failures or accidents, oil or natural gas spills or leaks, shortages or delays in the availability or in the delivery of equipment, delays or cancellation of environmental licenses or other government authorizations or judicial decisions, fires, explosions, blow-outs, surface cratering, pipeline failures, theft and damage to our transportation infrastructure, sabotage, terrorist attacks and criminal activities.

Some of our operations in Colombia and abroad could be conducted in remote and uninhabited locations that involve health and safety risks that could affect our workforce. By our own Company policy and practices, as well as under Colombian law and international industrial safety regulations, we are required to have health and safety practices that minimize risks and health issues faced by our workforce. Failure to comply with health and safety regulations in the jurisdictions where we operate may lead to investigations by health officials that could result in lawsuits or fines.

We may be required to incur in additional costs and expenses to allocate funds to industrial safety and health compliance under Colombian law and international industrial safety regulations. Additionally, if any operational incident occurs that affects local communities and ethnic communities in nearby areas, we will need to incur in additional costs and expenses in order to return affected areas to normality and to compensate for any damages we may cause. These additional costs may have a negative impact on the profitability of the projects we may decide to undertake.

The occurrence of any of these operating risks could result in substantial losses or slowdowns to our operations, including injury to our employees, malfunction or destruction of property, equipment and infrastructure, clean-up responsibilities, third-party liability claims, government investigations and imposition of fines, withdrawal of environmental licenses and other government permits, suspension or shutdown of our activities and loss of revenue. The occurrence of any of these events may have a material adverse effect on our financial condition and results of operations.

Our involvement in deep-water drilling either as direct operator or in conjunction with our business partners involves risks and costs, which may be out of our control.

Our deep-water drilling activities present severe risks, such as the risk of spills, explosions on platforms and drilling operations, and natural disasters. The occurrence of any of these events or other incidents could result in personal injuries, loss of life, severe environmental damage with the resulting containment, clean-up and repair expenses, equipment damage and liability in civil and administrative proceedings. As a result, more stringent government regulation may result in increased costs and longer exploration and development timeframes for our deep-water drilling operations and consequently could adversely affect our results of operations and financial condition. Heightened risks and costs associated with deep-water drilling may have a negative effect on our results of operations and financial condition and in our reputation.

See the section [Business Overview—Exploration and Production](#) for a summary of our current deep-water drilling activities.

We are exposed to the credit, political and regulatory risks of our customers and any material nonpayment or nonperformance by our key customers could adversely affect our cash flow and results of operations.

Some of our customers may experience financial problems that could have a significant negative effect on their creditworthiness. Severe financial problems encountered by our customers could limit our ability to collect amounts owed to us, or to enforce the performance of obligations owed to us under contractual arrangements. In addition, many of our customers finance their activities through their cash flows from operations, short and long term debt or equity.

The combination of decreasing cash flows as a result of declines in commodity prices, a reduction in borrowing bases under reserve-based credit facilities and the lack of availability of debt or equity may result in a significant reduction of our customers' liquidity and limit their ability to make payments or perform their obligations to us according to their contractual terms.

Furthermore, some of our customers may be highly leveraged and subject to their own operating expenses. Therefore, the risk we face in doing business with these customers may increase. Other customers may also be subject to regulatory changes, which could increase the risk of defaulting on their obligations to us. We also could have disagreements with customers regarding tariffs, excusable events, or other aspects of our commercial relations that could lead to contract breaches by our clients. See Note 30.7 to our consolidated financial statements for more details.

Such financial problems experienced by our customers or deterioration in our relations with our customers could result in the impairment of our assets, a decrease in our operating cash flows and may also reduce or restrict our customers' future use of our products and services, which may have an adverse effect on our revenues and our ability to make payments under our existing debt obligations.

Our ability to access the credit markets as well as the debt and equity capital markets on favorable terms to obtain funding to finance our operations or refinance our debt maturities may be limited due to the deterioration of these markets, any change to our credit ratings and the authorizations we need before incurring any financial indebtedness or executing any equity offering.

A new financial crisis, volatility in prices in the oil and gas sector, the potential impacts on demand of further lockdowns or outbreaks of COVID-19, the lack of consensus among OPEC+ members, the political uncertainty in the region, the discovery of corruption by governments and private companies in emerging markets and further geopolitical disruptions in the Middle East, which could involve developed countries, and in turn could worsen risk perception with respect to the emerging markets, or the occurrence of any of the risks described in the section [Risk Review—Risk Factors—Risks Related to Colombia's Political and Regional Environment](#) could make it more difficult for us and our subsidiaries to access international and local capital markets and finance our operations and potentially refinance our debt maturities on terms acceptable to us. These conditions, along with significant write-offs in the financial services sector and the re-pricing of credit risk, can make it difficult for us to obtain funding for our capital needs on favorable terms. Our cost and ability to obtain capital might be affected as well if our creditors and potential investors believe that we are not actively responding to the new low carbon economy, integrating ESG considerations in our operation and management, and addressing risks related to climate change; considering further the evolving restrictions to invest in pure fossil fuels companies announced by certain investors worldwide.

Access to credit and capital markets is also dependent on our credit ratings, which are mainly determined by our financial and operational strength, oil and gas market conditions and the support that could be provided by the Colombian government. We cannot assure that our credit ratings will continue for any given period of time or that the ratings will not be further lowered or withdrawn. An assigned rating may be raised or lowered depending, among other things, on the respective rating agency's assessment of our financial strength. In addition, a downgrade in the rating of the Republic of Colombia could also trigger a downgrade on ours, as it is capped by the rating of the Republic of Colombia and the implicit support that can potentially be provided to the Company. On April 3, 2020, Fitch Ratings downgraded our credit rating from BBB to BBB- as a consequence of our direct linkage of the company to the sovereign rating downgrade of the Republic of Colombia. On March 26, 2020, S&P revised our outlook to negative and affirmed our stand-alone credit rating in bbb-. On July 31, 2020, Moody's confirmed our long-term international rating at Baa3, with a stable outlook. We cannot offer any assurance that our credit rating will continue.

As a result of these factors, we may be forced to revise the timing and scope of our capital projects as necessary to adapt to existing market and economic conditions, downgrades to our credit ratings or to access the financial markets on terms less favorable, therefore negatively affecting our results of operations and financial condition.

In addition, under applicable regulation, most of our indebtedness must be previously authorized by the Colombian Ministry of Finance and Public Credit and the National Planning Department and local bond issuances by the Financial Superintendency of Colombia. Likewise, our equity offerings must abide to the terms set forth in Law 1118 of 2006 and any operation within the domestic equity capital market must be previously approved by the Financial Superintendency of Colombia. As such, our access to debt and equity funding is subject to the Government's time frames and policies, and we cannot guarantee that such authorizations would be granted in a timely fashion or granted at all.

We may be exposed to increases in interest rates, thereby increasing our financial costs.

We may incur debt locally and in the international capital markets and, consequently, may be affected by changes in prevailing interest rates. If market interest rates increase, our financing expenses may increase, which could have an adverse effect on our results of operations and financial condition.

As of December 31, 2020, approximately 13.62%, or a principal of US\$ 1.8 billion (COP\$ 6.1 trillion, using a COP\$ 3,432.50/1.00 US exchange rate as of December 31, 2020), of our total indebtedness consisted of floating rate debt. If market interest rates rise, our financing expenses will increase, which could have an adverse effect on our results of operations and financial condition. In addition, as we refinance our existing debt in the coming years, the mix of our indebtedness may change, specifically as it relates to the ratio of fixed to floating interest rates, the ratio of short-term to long-term debt, and the currencies in which our debt is denominated in or indexed to. We cannot assure that such changes will not result in increased financing expenses borne by us. Finally, as we incur new debt in the future to fund our capital projects or inorganic acquisitions, the prevailing interest rates and spreads at any specific time could be less favorable in terms of cost when compared to our previous financing transactions, which could adversely affect our financial condition and results of operations.

Our interest rate expense may be subject to uncertainty associated with the replacement or reform of benchmark indices, particularly London Interbank Offered Rate ("LIBOR").

Interest rate, equity, foreign exchange rate and other types of indices which are deemed to be "benchmarks," including those in widespread and long-standing use, have been the subject of ongoing international, national and other regulatory scrutiny and initiatives and proposals for reform. Some of these reforms are already effective while others are still to be implemented or are under consideration. These reforms may cause benchmarks to perform differently than in the past, or to disappear entirely, or have other consequences, which cannot be fully anticipated.

Any of the benchmark reforms that have been proposed or implemented, or the general increased regulatory scrutiny of benchmarks, could also increase the costs and risks of administering or otherwise participating in the setting of benchmarks and complying with regulations or requirements relating to benchmarks. Such factors may have the effect of discouraging market participants from continuing to administer or contribute to certain benchmarks, trigger changes in the rules or methodologies used in certain benchmarks or lead to the disappearance of certain benchmarks.

In this regard, on July 27, 2017, the U.K. Financial Conduct Authority (the authority that regulates LIBOR) announced that it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. It is unclear whether new methods of calculating LIBOR will be established such that it continues to exist after 2021. Similarly, it is not possible to predict whether LIBOR will continue to be viewed as an acceptable market benchmark, what rate or rates may become acceptable alternatives to LIBOR, or what effect these changes in views or alternatives may have on financial markets for LIBOR-linked financial instruments. As of December 31, 2020, 8.3% of our long-term nominal debt was subject to floating interest rates that used LIBOR as the benchmark. Although we expect to adapt such contracts as developments relating to a LIBOR replacement arise, currently, we cannot reasonably estimate the impact that the transition to alternative reference rates may have on the valuation, pricing and operation of our LIBOR-based financial obligations, however such changes could have a material adverse effect on our financial condition and results of operations.

Our current and planned investments and exploration activities outside Colombia are exposed to political and economic risks.

We began exploration activities outside Colombia in 2006 through our Brazilian subsidiary, Ecopetrol Óleo e Gás do Brasil Ltda. We operate through business partners, subsidiaries or affiliates outside Colombia. We currently have investments, joint ventures and subsidiaries incorporated in Peru, Brazil, Mexico, Bermuda, Panama, the Cayman Islands, Switzerland, Spain, the United Kingdom and the United States, and we are analyzing investments in other countries. In connection with making investments, we are and will be subject to risks related to economic and political conditions and governmental economic actions. We cannot predict the positions of foreign governments relating to the oil and gas industry, land tenure, protection of private property, environmental standards, regulation or taxation; nor can we assure that future governments will maintain policies favorable to foreign investment or repatriation of capital. Additionally, we may face new and unexpected risks involving environmental and other legal requirements beyond those we currently experience.

The results of operations and financial condition of our subsidiaries in these countries also may be adversely affected not only by risks associated with hydrocarbon exploration and production, but also by fluctuations in their local economies, political instability and government actions, including: the imposition of price controls, the imposition of restrictions on hydrocarbon exports, fluctuation of local currencies against the Colombian Peso, the nationalization of oil and gas reserves, increases in export and income tax rates for crude oil and oil products, and unilateral (governmental) institutional and contractual changes, including controls on investments and limitations on new projects.

Any of these conditions occurring could disrupt or terminate our operations, causing our development activities to be curtailed or terminated in these areas, or our production to decline, limit our ability to pursue new opportunities, affect the recoverability of our assets, or cause us to incur additional costs or delay the timeline of our projects.

Our future performance depends on the successful selection, development and deployment of new technologies and the knowledge to operate, maintain and improve them.

Technology, knowledge and innovation are essential to our business, especially for the addition of reserves in complex settings, reducing operational costs, reducing the carbon footprint of our operations and in our adaptation to the energy transition. If we do not develop the right technology, or do not secure access to required third-party technology, or if we fail to deploy the right technology, do not obtain the expertise to operate our deployed technology or to improve our processes, or do not deploy the knowledge necessary to improve such technology effectively, the achievement of our corporate goals, our profitability and our earnings may be adversely affected. Furthermore, as we transition to a new low carbon economy and address climate change, we face the risk that our progress may be curtailed due to the high cost of low-carbon and water management technologies. In the case of our enhanced oil recovery program, we not only depend on the successful selection, adaptation, demonstration and deployment of appropriate technologies but also in the reservoir response to the application of these recovery technologies.

Our performance could be negatively affected by the lack of employees with the skills needed to execute our business strategy.

As the oil and gas industry faces an increasing number of challenges, the ability to react quickly to these challenges has become a key factor in achieving efficiency, profitability, growth and sustainability. Our ability to achieve these goals could be negatively affected by a lack of key skilled employees that can execute our business strategy and transition to a low carbon economy with competency, creativity and determination. This situation poses a risk if we are unable to timely strengthen the capacities of management at all levels of the organization and develop the skills they need to find the solutions to implement climate-resilient initiatives and to achieve our decarbonization goals.

If the strategic plans associated to natural gas and NGL failed to yield the expected results, our operations may not be able to keep pace with the increasing domestic demand for these products.

According to the latest Natural Gas Supply Plan issued by the Mining and Energy Planning Unit in January 2020 (*Unidad de Planeación Minero Energética-UPME*), there is expected to be a natural gas deficit in Colombia as of January 2024.

Considering the CREG Resolution 186 of 2020, the natural gas market is a physical market, which means that suppliers must comply with the quantities agreed in their contracts with firm gas commitments.

Additionally, we are currently party to a number of national gas supply contracts that have firm gas commitments. If we were unable to deliver natural gas to these clients as a result of cuts in operations or higher decline rates in our gas fields, among other reasons, we may be required to compensate our customers for our failure to supply natural gas.

Delays in the implementation of our strategic plans associated to natural gas and NGL could result in Ecopetrol losing market share if clients choose to secure their supply with other sources instead (such as third party gas suppliers or imports). As a result, our financial condition and results of operations could be impacted.

We depend on others for the construction and availability of natural gas transportation infrastructure for the transport of our gas, which may limit our ability to develop new or existing fields or lead to the deterioration of related assets and may not allow us to recover the cost of capital invested in natural gas discoveries.

Ecopetrol S.A. can only hold up to 25% of the equity of any natural gas transportation company according to Article 5 of CREG Resolution 057 of 1996 (except for transportation assets acquired before this Resolution). Therefore, there can be no assurance that the transportation infrastructure necessary to transport natural gas from the fields to distribution points and our customers will be built by third parties or that if built there will be sufficient capacity available to us for the exploitation of new natural gas discoveries or the development of existing fields due to the non-financial closure of transport projects or lack of signed contracts with transporters. The failure to commercially exploit new or existing discoveries may result in impairment of the related assets and our inability to recover the capital expenditures invested to make these natural gas discoveries.

Our operations could be affected by reactions of labor unions, social organizations, communities and contractors to Colombia's political and social environment, environmental and climate change concerns and organizational changes.

Due to Colombia's political and social environment, emerging environmental and climate change concerns and organizational changes, social organizations in the communities where we have operations, communities in general, contractors and unions, may have reactions and present their demands through social movements, which could have an adverse effect on our operations and financial condition.

On July 1, 2018, a new collective bargaining agreement became effective for a term of four and half years, expiring on December 31, 2022. We cannot assure you that we will not experience strikes or labor unrest in the future.

Our activities may be interrupted or affected by external factors, such as abnormal weather conditions and natural disasters that can be exacerbated by climate change.

The effects of climate variability and climate change, such as the increase in the frequency and intensity of climate phenomena such as "La Niña" and "El Niño", intensify the risk of natural disaster occurrence, such as floods, landslides, water availability, wild fires, droughts, increased temperature and rising sea and river levels, among others, which may affect our business operations.

In Colombia, the "El Niño" climate phenomenon is characterized by (i) a lack of rainfall, which may drastically decrease surface waterbodies flows, affecting both freshwater withdrawals required for operations and wastewater discharges because of the reduction on dilution potential of receiving waterbodies, (ii) increased temperatures, which causes heat waves and could have a direct impact on the health of our workers and cause an increase in epidemics and diseases and (iii) potential negative impact on energy supply due to the decrease in the level of the rivers that feed the hydroelectric generation system of the country. In addition to the "El Niño" climate phenomenon, some basins in Colombia may be affected by seasonal variability in some periods of the year (normally January to March - June to July), which could reduce water flows, affecting freshwater withdrawals and surface discharges, as mentioned previously.

Furthermore, the "La Niña" climate phenomenon is characterized by increased rainfall, which can generate (i) landslides that threaten pipeline infrastructure and increase the risk of ruptures that may cause hydrocarbon spills and limit road transportation and (ii) flooding, which could limit operations in our production fields and facilities.

These risks could result in property damage, loss in production, loss of revenue, loss of life, pollution and harm to the environment, among others. If any of these occur, we may be exposed to economic sanctions, damages, fines or penalties in addition to the negative effects these events may have on our operations and the costs required to repair or remediate the related damage. These costs, fines and penalties may adversely affect our financial condition, reputation and results of operations.

Our business operations and financial condition could be negatively affected by the COVID-19 or other pandemic diseases and health events.

Pandemic diseases and health events, such as COVID-19, have the potential to negatively impact economic activities in many countries, including the countries in which we operate or have trade links, with consequent adverse effects on our customers and business.

In particular, the timeline and potential magnitude of the COVID-19 outbreak still remain unknown. The persistence and variation of the virus could continue to more broadly affect the Colombian and global economy, including our business and operations, because of its impact on the demand for oil and gas. For example, the outbreak of coronavirus has resulted in a widespread health crisis that has adversely affected the economies and financial markets of many countries, resulting in an economic downturn that affected our operating results in 2020. In addition, the effects of COVID-19 and concerns regarding its global spread have recently negatively impacted the domestic and international demand for crude oil and natural gas, which has contributed to price volatility, impacted the revenues we receive for oil and natural gas, and has materially and adversely affected the demand for and marketability of our production, and is anticipated to continue to adversely affect the same for the foreseeable future. As the potential impact from COVID-19 is difficult to predict, the extent to which it will negatively affect our operating results, or the duration of any potential business disruption is uncertain. The magnitude and duration of any impact will depend on future developments and new information that may emerge regarding the severity and duration of COVID-19 and the actions taken by authorities to contain it or treat its impact, all of which are beyond our control.

In terms of the impact on Ecopetrol, the disagreement on production cuts between the Organization of the Petroleum Exporting Countries (OPEC) and Russia since the beginning of March 2020 through April, 2020, followed by the decision of Saudi Arabia to reduce its sale oil prices and increase its production to gain market share, negatively impacted the international reference prices for crude oil and refined products in 2020. Furthermore, as a result of the COVID-19 pandemic and measures put in place to slow its spread, including the imposition of quarantines and medical screenings, travel restrictions and the suspension of certain activities, we have seen and expect to continue to see substantial uncertainty in macro-economic conditions with regards to lower prices and demand for oil, gas and related products. These recent global developments resulted in a significant drop in Brent crude prices during 2020 as compared to 2019. As our business depends substantially on international prices for crude oil and refined products, while we were able to recuperate some of the losses suffered during the second quarter of 2020, the sharp decrease in oil prices in 2020 negatively impact our results of operations and business prospects for the year ended December 31, 2020 as compared to the year ended December 31, 2010. In particular, our consolidated gross profit, consolidated operating income, and consolidated net income for 2020 decreased by 52.3%, 65.8% and 81.8%, respectively, as compared to the same line items in 2019. Our operating results were affected mainly by (i) decreases in international prices of crude oil, international prices for refined products and local prices for natural gas, (ii) the reduced demand levels for crude oil and its derivative products, and (iii) decreases in sales volumes, product mix and exchange rate volatility.

For the year ended December 31, 2020, we also recognized impairment losses of non-current assets of COP\$ 633,156 million, which corresponds to the net result of:

- An impairment of non-current assets in the exploration and production segment mainly due to the decrease in crude oil price forecast in the short and long term.
- An impairment of non-current assets in the refining and petrochemicals segment, primarily related to the lower refining margins at the Cartagena Refinery and the Barrancabermeja Refinery Modernization Plan, considering the progress in technical analysis of the project.
- A reversal of impairment of non-current assets in the transportation and logistics segment, primarily as a result of a recovery in the transported volumes in 2020 through: (i) South CGU, which includes the TransAndino Pipeline – OTA and the Port of Tumaco, and (ii) North CGU, which includes the Banadía-Ayacucho's pipeline, part of the Caño Limón-Coveñas system.

At this point, we cannot forecast the duration of the effects of COVID-19 on our business or when international prices for crude oil and refined products will stabilize. Our future business results will be affected by the extent and duration of these conditions and the effectiveness of responsive actions that we and others take, including (i) our actions to reduce capital and operating expenses, (ii) in respect of oil supply, any cooperation between OPEC member countries, and (iii) in respect of COVID-19, the impact of vaccination programs, coverage and immunity achieved, the severity and duration of the outbreak, and the actions by national and international government authorities to contain the pandemic and minimize its impact, among other things. We will continue to monitor market developments and evaluate the impacts of decreased demand on our production levels as well as impacts on project development and future production.

See Note 2.8 to our consolidated financial statements for further information.

Our operations, including our activities in areas classified as indigenous reserves and Afro-Colombian lands, are subject to opposition from members of various communities.

We currently carry out and plan to continue carrying out activities in areas classified by the Government as indigenous reserves and Afro-Colombian lands. In order to undertake these activities, we must first comply with prior consultation processes, set forth by Colombian law. These prior consultation processes are required for obtaining environmental licenses to start our projects, works or activities in areas inhabited by ethnic communities. In addition, consultations can be seen as a potential instrument to involve communities in the decision of developing extracting industry and infrastructure projects in their territories. Generally, these consultation processes last between six months to one year depending on the community expectations, but may be significantly delayed if we cannot reach an agreement with the communities. We strive to be respectful of the Constitution and laws and the autonomy of indigenous and afro-descendant communities, and we therefore do not enter their territories until we have reached an agreement with them.

In recent years, indigenous communities have also been claiming their ancestral territories and requesting recognition of their right to be consulted about projects already in operation. We may be exposed to operational restrictions as a result of the opposition of these communities.

No certainty can be given that we will be able to reach an agreement with the different communities that do not agree and object to our operations or that such communities will participate in consultation processes if available. We may be exposed to similar delays due to the objection from local communities in other countries where we carry out our activities.

Our activities may be subject to objection, including protests by not-ethnic communities. We are also subject to other participation mechanisms, such as popular consultation “acción popular”, where local communities vote against the development of extractive industry projects. Any such similar situation may affect our future projects.

We have made significant investments in acquisitions and divestments and we may not realize the expected value.

We have acquired interests in several companies in Colombia and abroad and in 2019 entered into a joint venture with Oxy in the U.S. Permian Basin. See the section Business Overview—Our Corporate Structure. Obtaining the expected benefits of the acquisitions will depend, in part, on our ability to (i) obtain the expected results of operations and financial condition from these acquisitions, (ii) manage different sets of assets and operations and integrate distinct corporate cultures, (iii) manage our objectives as a corporate group, and (iv) institute our corporate governance rules as well as other factors beyond our control such as the economic and regulatory environment in countries in which we have made acquisitions as well as all other risks affecting the oil and gas industry. These efforts may not succeed. Our failure to successfully obtain the expected results from our acquisitions could adversely affect our financial condition and results of operations. Also, the acquisitions may be subject of review by administrative control entities in Colombia, which could negatively impact us and could divert the efforts and attention of our management team from our ordinary business operations.

In our shale operations in the U.S., the ability to drill and develop different locations is subject to uncertainties such as natural gas and oil prices, drilling and production costs, availability of drilling services and equipment, lease acquisitions and expirations, processing capacity constraints, pipeline transportation bottlenecks, access to and availability of water sourcing and distribution systems, regulatory approvals, among others. We cannot assure that all the well locations we have identified will ever be drilled or if we will be able to produce natural gas or oil at the planned levels.

As of the date of this annual report, there is not a clear position of the new United States' administration regarding policies concerning Colombia. Moreover, from the original executive orders signed by President Biden related to climate change, there is a 60 day suspension to issue, extend or amend federal leases or drilling permits on federal land, while a task force conducts an environmental study. This order does not affect operations that were already on going or under drilling permits issued prior the order, but we cannot assure there will be no further executive orders that may adversely affect our U.S. operations. These executive orders also established additional task force groups to review changes in fiscal and regulatory policies, which may include changes in royalty rates, minimum bids and lease terms for federal land. Ecopetrol's investments in the United States include federal land (Gulf of Mexico), therefore there is uncertainty in terms of how any future regulatory changes by the Biden administration will affect such leases.

In addition, as a result of strategic reassessments of our core operations and portfolio management analysis, we have executed partial or total divestments in our current businesses and the sale price in these transactions might not have been enough to realize the original expected value or to recover the investments the company has made. These transactions may also be subject to review by administrative control entities in Colombia, which could negatively impact us and could divert the efforts and attention of our management team from our ordinary business operations.

We might be required to provide financial support to our subsidiaries in Colombia or abroad.

Although currently Ecopetrol is not the sponsor and has not provided guarantees to third parties to support the financing activities of any of its subsidiaries, some financial support at any point in time might be needed to assure the long term viability of such subsidiaries when exposed to unexpected conditions, results, or when it is utterly required to support projects in their developing phase, in particular with respect of those pre-operative affiliates.

Any situation that could affect the operations of our subsidiaries, or make them financially non-viable, particularly for those that are about to enter into their development phase or for those that recently entered into operations, may have a negative impact on their profitability as well as on their ability to pay their liabilities, which in turn could adversely affect our financial condition and results of operations.

Ongoing Colombian State control entities investigations regarding our subsidiary Reficar and our former subsidiary Bioenergy could adversely affect us.

Ecopetrol, Bioenergy and Reficar's employees are generally subject to the control and supervision of the Colombian State control entities. See section [Risk Review—Legal Proceedings and Related Matters](#) for additional information. The investigations concerning Reficar and Bioenergy, as well as other at Ecopetrol, that are described in section [Risk Review—Legal Proceedings and Related Matters](#) remain ongoing. While we are cooperating fully with both cases, adverse developments in connection with these investigations, including any expansion of the scope of the investigations, could negatively impact us and could divert the efforts and attention of our management team from our ordinary business operations.

In connection with this investigation or any other investigation carried out by any other authority, there can be no assurance that we will not incur in additional costs and expenses or expose us or our employees to sanctions and lawsuits, any of which could adversely impact our reputation and, in turn, could have adverse effects on our financial condition and results of operations. See section [Risk Review—Risk Factors—Legal and Regulatory Risk—We may incur losses and spend time and money defending pending lawsuits and arbitrations and responding to administrative investigations](#).

Our results may be affected by the performance of our suppliers, our business partners or their third-party service providers.

Some of our suppliers may face financial or operational problems that could lead them to a breach of their obligations settled under contractual arrangements. Other suppliers may also be subject to regulatory changes or sanctions that could increase the risk of defaulting on their obligations to us, which could have an adverse effect on our operations and financial condition.

Most of our activity depends on suppliers, sub-contractors and third party service providers that provide goods and services for our operations and projects. In addition, some of our operations and projects are performed through joint ventures or other contractual arrangements with our business partners or third party service providers. Consequently, we depend on the performance of our business partners or third party service providers. The poor performance of our suppliers, in any criteria such as operational efficiency, deadlines, administrative aspects, HSE, or our business partners or third party providers, especially in those projects in which we do not act as operator, could negatively impact the execution of projects and operating performance, which in turn could have a negative impact on our results of operations and financial condition. We are exposed to the risk of not finding business partners or suppliers with the appropriate skills and performance we require for our projects. We are also indirectly exposed to supply agreements and other third-party services contracted by our business partners acting as operators under joint venture agreements.

Our insurance policies do not cover all liabilities and may not be available for all risks.

Our insurance policies do not cover all liabilities, and insurance may not be available for all risks. There can be no assurance that incidents will not occur in the future, that insurance will adequately cover the entire scope or extent of our losses or that we will not be found liable in connection with claims arising from these and other events, which could adversely affect our financial condition and results of operations.

Additionally, due to worldwide market conditions and limitations associated to interpretations and decisions made by the Colombian Surveillance and the Office of the Comptroller General with regards to director and officer insurance, in recent years the terms and conditions of our director and officer insurance policy have been affected, including through a decrease in limits and coverages, which could affect future decisions expected to be made by such directors and officers and could lead to an adverse effect on our financial condition and results of operations.

New trends in the insurance sector in the face of climate change may bring additional costs or create new conditions to be addressed by our Corporate Insurance Program.

We have identified three main insurance trends arising from the transition to a new low carbon economy and climate change that could have a negative impact on the Company (i) insurance and reinsurance companies are considering retiring from the oil & gas industry or are imposing new demands regarding decarbonization targets, which may affect the insurability of assets or higher premiums (ii) policy coverage may change as climate risk modeling and assessment advance, leading to changes in underwriting policies and new policy exclusions, and (iii) increase frequency or intensity of climate related events may lead to increase in premium prices. While we plan to address these trends by quantifying their financial impact and in assessing the need for new risk transfer and risk retention strategies, we can not yet assure that these trend will not increase our insurance costs or reduce our insurance coverage, which could adversely affect our financial condition and results of operations.

A failure in our information technology systems or cyber security attacks may adversely affect our financial results.

We depend on the reliability and security of our information technology systems to conduct certain exploration, development and production activities, process financial records and operating data and communicate with our employees and business partners, and for many other activities related to our business. Our information technology systems may fail or have other significant shortcomings due to operational system flaws or employee misuse, tampering or manipulation. In addition, we may become the target of cyber-attacks or information security breaches that could result in the unauthorized release, gathering, monitoring, misuse, loss or destruction of proprietary and other information. Any of these occurrences could disrupt our business, result in potential liability or reputational damage or otherwise have an adverse effect on our financial results.

During 2020, our internal cyber security systems identified and contained cyber security attacks such as malware, phishing and denial of service. We did not have any critical incidents during the year and although we have not experienced any material losses relating to failure of our information technology systems or cyber incidents, there can be no assurance that we will not suffer such losses in the future.

We are exposed to behaviors incompatible with our ethics and compliance standards.

Given the large number of contracts that we are a party to in Colombia and abroad with local and foreign suppliers, the geographic distribution of our operations and the great variety of actors that we interact within the course of business, we are subject to the risk that our employees, contractors, or any person having relations with us may misappropriate our assets, manipulate our assets or information or engage in money laundering or the financing of terrorism, for such person's personal or business advantage. Our systems for identifying and monitoring these risks may not be effective to fully mitigate them in all situations. Such acts may result in material financial losses or reputational harm to the Company.

The reliability and capacity of national power supply systems may affect or limit the continuity of our operations or limit growth.

Our average energy consumption in 2020 was 7,097 GWh/year, of which 68% was supplied through self-generation, and the remaining 32% through power grid. Our demand is 10% of the total energy demand in Colombia. Our self-generation is subject to fuel and solar availability. In addition, several producing fields are connected to the national transmission system and depend on its expansion and reliability to keep steady production levels. The national electricity market is volatile due to changes in hydrology and availability of fuels (natural gas, diesel etc.), bringing uncertainty to prices. If energy were to become unavailable or difficult to obtain, our results of operation and financial condition could be adversely affected.

Rising water production levels may affect or constrain our crude oil production.

During 2020, the Ecopetrol Group produced approximately 16.3 million barrels of water per day. Taking into account the nature of our reservoirs, the water production levels to be managed by the Company may increase in the future. In order to achieve our oil and gas production goals and to avoid any production restrictions going forward, we will need to secure the required capacity to manage water levels. Factors that may trigger a possible constraint in our crude oil production due to the rising water production levels are: (i) ineffective project management of the required facilities, (ii) the Company's and its partners' ability to timely obtain the environmental permits related to water management, (iii) social and community interactions that could affect the development and operation of these projects, and (iv) the availability of capital to execute the required projects.

5.2.2 Risks Related to Colombia's Political and Regional Environment

This section discusses potential risks related to our extensive operations in Colombia.

The worldwide economic effects of the outbreak and economic shutdown caused by the COVID-19 pandemic is adversely affecting Colombia's economy, and the impact could be material.

The COVID-19 pandemic is currently having an adverse impact on the world economy. Many countries have undertaken various public health measures to control the spread of COVID-19, including mandatory quarantines, forced economic shutdowns and travel restrictions, as well as economic measures to mitigate the impacts of such public health policies on their respective national economy. As of March 31, 2021, Colombia had 2,406,377 confirmed cases of COVID-19, 2,285,515 recovered cases and 63,422 deaths.

On March 17, 2020, the Government, through Legislative Decree 417 of 2020, declared a 30 day state of national emergency in light of the health and economic crisis caused by the outbreak of COVID-19. On May 6, 2020, through Legislative Decree 637 of 2020, the Government declared a state of emergency for an additional 30 days. The Government has implemented various economic and public health measures to address the crisis, including (i) mandatory shelter in place orders; (ii) border closure for all non-citizens and non-residents; (iii) short term and low interest loans for all types of agricultural producers; (iv) payroll subsidies for companies and credit lines for different sectors of the economy; (v) closure of all schools and universities; (vi) incentivizing working from home and a mandatory work from home order for 80% of Government employees; (vii) actions by the Banco de la Republica, including reductions of its interest rate by 250 basis points in 2020, the provision of non-delivery forwards in the amount of up to U.S. \$1 billion and supplying liquidity auctions up to COP\$ 20 trillion; (viii) suspension of increases in utility tariffs; (ix) reduction in the prices of gasoline; (x) changes to the general budget and measures to render more flexible certain procedures to enable the Government to access the credit markets; and (xi) increased COVID-19 testing of up to 15,000 per day, among others. The efficacy of certain of these measures cannot yet be evaluated, and their duration and effect remain uncertain. On December 18, 2020, the Government announced that the country had purchased 40 million doses of COVID-19 vaccines, composed of 10 million doses from Pfizer Inc., 10 million doses from AstraZeneca and 20 million doses from the multilateral Covax agreement. Vaccination began in February 2021 and will have 5 phases, prioritizing those at higher risk, such as health workers and citizens over 80 years old.

From a macroeconomic point of view, the COVID-19 pandemic had a negative impact on Colombia in 2020 with GDP decreasing by 6.8% for the year ended December 31, 2020 as compared to the year ended December 31, 2019. The main industries that lead to this decrease were construction, transportation, and accommodation, real estate and food services. Economic stagnation, the depreciation of the Colombian Peso, contraction and decreased income levels and increased unemployment levels could result in a pronounced period of economic slowdown in Colombia, which could lead to a further decrease in oil and gas demand and hence could continue to negatively impact our business and financial condition. Furthermore, the COVID-19 outbreak has also resulted in increased volatility in both the local and the international financial markets and economic indicators, such as exchange rates, interest rates, credit spreads and commodity prices. Any shocks or unexpected movements in these market factors could result in financial losses in our investment portfolio.

If the economic and public health crisis caused by the COVID-19 outbreak continues and the Government's measures are not effective, the economic performance of the country may suffer further than already anticipated, as a result of adverse effects on commerce, transportation and foreign investment, among other things, and thus may potentially adversely affect Ecopetrol's ability to service its debt, including the bonds. The effects of the COVID-19 pandemic and the economic shutdown may also include an increase in unemployment, a reduction in household income, reduction in Government revenues, increased Government expenditures and a deterioration of Ecopetrol's and Colombia's financial position. The sharply lower demand for oil and its derivatives due to decreased demand as a result of the COVID-19 pandemic in turn resulted in lower and more volatile price of oil and gas, which has also negatively affected the Colombian economy and the financial position of Ecopetrol. The Government has projected negative GDP growth of 6.8% for 2020, the first recession in Colombia in over two decades.

The COVID-19 pandemic, any additional wave or resurgence and/or new pandemic may also have the effect of heightening the other risks described herein, such as those relating to economic, social and political developments in Colombia and its credit ratings. Consequently, the current COVID-19 pandemic and its potential impact on the global economy may require Colombia to enact additional changes to existing regulations or implement more stringent regulations, which may further adversely impact the Republic's economy, the prices of, and Colombia's ability to make payments on, its outstanding securities or other indebtedness.

The Colombian government could seize or expropriate Ecopetrol's assets under certain circumstances for fair compensation.

Pursuant to Articles 58 and 59 of the Colombian constitution, the Government can exercise its eminent domain powers in respect of private property assets in the event such action is deemed by the Government to be required in order to protect public interests. According to Law 388 of 1997, eminent domain powers may be exercised through: (i) an ordinary expropriation proceeding, or (ii) an administrative expropriation. In all cases we would be entitled to a fair compensation for the expropriated assets. Also, as a general rule, compensation must be paid before the asset is effectively expropriated. However, the compensation may be lower than the price for which the expropriated asset could be sold in a free-market sale or the value of the asset as part of an ongoing business. The aforementioned Article 59 of the Colombian constitution establishes a temporary expropriation for war reasons, which does not require that compensation be paid before expropriation.

Colombia has experienced internal security issues that have had or could have a negative effect on the Colombian economy and on us.

Colombia has experienced internal security issues, primarily due to the activities of guerrillas, paramilitary groups, drug cartels and criminal bands known as *Bacrim*. From time to time, guerrillas target crude oil and multi-purpose pipelines, including the Oleoducto Transandino, Caño Limón - Coveñas and Oleoducto Bicentenario pipelines, and other related infrastructure disrupting our activities and those of our business partners.

During 2020, the attacks against our pipeline infrastructure decreased by 29% in relation to 2019 (51 attacks in 2020 compared with 72 attacks in 2019). Nonetheless, the attacks especially affected the infrastructure located in the Norte de Santander, Arauca and Nariño departments and the Caño Limón - Coveñas and Transandino pipelines. There was no deferred production directly related to these attacks in 2020 as compared to a deferred production of 660,052 barrels in 2019. Throughout the first quarter of 2021, there were 12 attacks against our pipeline infrastructure.

Guerrilla attacks have resulted in unscheduled shutdowns of our transportation systems in order to repair or replace sections of pipelines that have been damaged, with deferral of production in certain fields, as well as caused us to undertake environmental remediation. In respect of the pipeline infrastructure, the direct cost of repairs due to terrorist attacks in 2020 was approximately COP\$213,300 million (US\$62.147 million, using a COP\$3,432.50/1.00 US exchange rate as of December 31, 2020). During 2020 we also experienced one particular attack to our production infrastructure in Casanare, specifically on the transfer line parallel to the Liria well that, while not affecting people or the environment, resulted in a dent.

During 2018, attacks resulted in the unavailability of our Caño Limón-Coveñas pipeline which led certain of our customers to request the early termination of their transport agreements. While we have reached preliminary settlement agreements with our customers in respect of these disputes, such agreements are subject to regulatory approvals. See Note 23.3 to our consolidated financial statements for further information.

Likewise, the theft of refined products and crude oil, as a result of security issues, may impact our operating and financial results in the future, as well as our reputation, due to the potential use of these products within the alkaloid chain production and the possible impact to communities and the environment, derived from this illegal practice. Associated with the above, the theft of crude oil has increased from approximately 1,808 bod in 2019 to approximately 2,744 bod in 2020, representing for Ecopetrol and its partners a consolidated loss of COP\$367,515 million for the year ended December 31, 2020 (US\$107,069 million, using COP\$3,432.50/US\$1.00 exchange rate as of December 31, 2020) and COP\$ 241,840 million for the year ended December 31, 2019. This situation is directly related to the increase of illicit crops, presence of guerrilla dissidents and other illegal groups in the areas of influence of the main crude transportation systems, such as as Caño Limón – Coveñas System (Catatumbo and Norte de Santander) and the Transandino System (Tumaco and Nariño). Furthermore, the theft of refined products is related to the presence of common crime that illegally markets these products, presenting losses of approximately 24 bod and 37 bod in the years ended December 31, 2020 and 2019, respectively.

These activities and their possible escalation and the effects associated with them have had, and may have in the future, a negative impact on the Colombian economy or on us, which may affect our customers, employees, assets or the environment, with resulting containment, clean-up and repair expenses.

Despite the peace agreement between the Colombian government and the FARC and the peace negotiation process attempts with the National Liberation Army (the ELN), some illegal and terrorist activities of guerrilla groups or their members may continue.

On November 30, 2016, the Colombian Congress approved a peace agreement between the Colombian government and the Revolutionary Armed Forces of Colombia, or FARC. Since then, the Colombian government has advanced in the process of gradually integrating many of the FARC members into civilian and political life. In spite of these efforts, in August 2019 some former leaders of this guerrilla left the process and announced the resumption of hostilities.

Likewise, the National Liberation Army, or ELN, guerrilla group, has increased its actions against the Colombian security forces and the critical infrastructure of the Nation, which we believe is an attempt to show its presence and influence in some regions and put pressure to resume peace negotiations that were interrupted since January 2019, as a result of the terrorist attacks carried out by the ELN. The Colombian Government proclaims that the continuity of the dialogues depends on the cessation of terrorist activities and the release of hostages by this group. It is expected that attacks against critical infrastructure will continue until a new bilateral ceasefire can be agreed upon.

Therefore, it is expected that some guerilla groups, such as the ELN, may continue their illegal and terrorist activities, including attacks on our infrastructure, resulting in a deterioration of Colombia's national security and our assets, which consequently may negatively impact our operating results.

There have been certain events in Colombia and abroad, which have resulted in political tensions between Colombia and some of its neighboring countries.

There have been certain events in Colombia and abroad, which have resulted in political tensions between Colombia and some of its neighboring countries.

In particular, the economic, political and social crisis in Venezuela is having a severe impact on Colombia's economy and social situation. This situation could affect the countries' diplomatic relations, impact border towns and cities, accelerate Venezuelan migration flow into Colombia, affect our borderline operations and therefore may have a negative impact on Colombia's economy and general security situation as well as in our operating results.

Companies operating in Colombia, including us, are subject to the prevailing economic conditions and the investment climate in Colombia, which may be less stable than the prevailing economic conditions and investment climate in developed countries.

Market prices of securities issued by Colombian companies, including us, are subject to the prevailing economic conditions in Colombia. A large portion of our assets and operations are located in Colombia and most of our sales are currently derived from our local crude oil and natural gas production and the production of our refineries located in Colombia. Accordingly, our financial condition and results of operations depend to a significant extent on macroeconomic and political conditions prevailing from time to time in Colombia and on the exchange rates between the Colombian Peso and the U.S. dollar.

If the perception of improved overall security in Colombia deteriorates or if the investment climate worsens, the Colombian economy may face lower growth rates than the ones posted recently, which could negatively affect our financial condition and results of operations. Additionally, the uncertainty of Colombia's economic recovery due to the COVID-19 pandemic could have an impact on our results.

Furthermore, the market price of our shares and American Depositary Shares, or ADSs, may be adversely affected by changes in governmental policies, particularly those affecting economic growth, exchange rates, interest rates, inflation and taxes. The Government has changed monetary, fiscal, taxation, labor and other policies over time and has thus influenced the performance of the Colombian economy. We have no control over the extent and timing of government intervention and policies.

5.2.3 Legal and Regulatory Risks

This section discusses potential legal and regulatory risks to Ecopetrol, including the risk of having to comply with new laws and regulations.

Our operations are subject to extensive regulation.

The Colombian hydrocarbons industry is subject to extensive regulation and supervision by the Government and regulatory agencies in matters including the award of exploration and production blocks by the ANH, the imposition of specific drilling and exploration obligations, restrictions on production, price controls, capital expenditures, liquidation of the Net Position of each refiner or importer with respect to the FEPC and required divestments. Existing regulation applies to virtually all aspects of our operations in Colombia and abroad. The commercialization activities of some of our products also face extensive regulation. Such regulation is subject to change by the applicable regulator affecting our ability to commercialize our products. See section Business Overview—Applicable Laws and Regulations.

The terms and conditions of the agreements with the ANH under which we explore and produce crude oil and natural gas generally reflect negotiations with the ANH and other governmental authorities and may vary by fields, basins and hydrocarbons discovered.

We are required, as are all oil companies undertaking exploratory and production activities in Colombia, to pay a percentage of our production to the Government as royalties. The Colombian Congress has modified the royalty program for crude oil and natural gas production several times in the last 20 years, as it has modified the regime regulating new contracts entered into with the Government. In the future, the Colombian Congress may once again amend royalty payment levels and such changes could have an adverse effect on our future exploration and production in Colombia. See section [Business Overview—Applicable Laws and Regulations—Regulation of Exploration and Production Activities—Business Regulation—Royalties](#) for a description of the current royalty scheme.

Our operations in Colombia are subject to extensive national, state and local environmental regulations. Environmental rules and regulations are applicable to our exploration, production, refining, transportation, supply and marketing activities, as well as the biofuels we produce. These regulations establish, among other things, quality standards for hydrocarbon products, air emissions and greenhouse gases, water discharges and waste disposal, soil remediation, water pollution and the general storage, handling, transportation and treatment of hydrocarbons in Colombia. Currently, all exploratory drilling projects in areas that do not yet have a license must undergo an environmental impact assessment and must receive an environmental license from the governmental agency responsible for awarding environmental licenses, the National Authority on Environmental License or ANLA. Environmental authorities with jurisdiction over our activities routinely inspect our crude oil fields, refineries and other production sites, and they may decide to open investigations or sanction proceedings, which may result in the imposition of fines, restrictions on operations or other sanctions in connection with potential non-compliance with environmental laws.

We are also subject to control and monitoring by the regional autonomous corporations (CAR), which are regional environmental authorities that grant permits for the use and exploitation of natural resources in areas or fields that have an Environmental Management Plan (PMA as per its Spanish acronym), in the same way they establish compensation measures for the use of these resources and perform monitoring, control and impose sanctions as result of investigations.

If we fail to comply with any of these national or regional environmental regulations, we could be subject to administrative and criminal penalties, including warnings, fines or closure orders of our facilities. Any such criminal penalty would be imposed on the legal representatives of the Company, including any legal representative, director or worker who participated or failed to take action related to the activities that lead to environmental damage. See section [Business Overview—Applicable Laws and Regulations—Regulation of Exploration and Production Activities—Business Regulation—Environmental Licensing and Prior Consultation](#).

Environmental regulation has become more stringent in Colombia in recent years. As a result, our operating costs have increased in order to comply with these new technical environmental requirements as well as the need to strengthen our specialized team in charge of environmental compliance in project and operations. If environmental laws continue to impose additional costs on us, we may need to reduce our investments on strategic projects in order to allocate funds to environmental compliance. We are also exposed to delays in obtaining environmental licenses from ANLA, which can lead to cost overruns or to changes in our investment plans. These additional costs may have a negative impact on the profitability of the projects we intend to undertake or may make them economically unattractive, in turn having a negative impact on our results of operations and financial condition.

Some of the companies in the business group perform exploratory activities outside of Colombian territory. As such, those companies are subject to foreign environmental regulations for the exploratory activities conducted by the business group outside of Colombia. Failure to comply with foreign environmental regulations may result in investigations by foreign regulators, which could lead to fines, warnings or temporary suspensions of our operations, which could have a negative impact in the consolidated financial statements and results of operations of the Ecopetrol Group.

In addition, the companies of the business group conducting upstream activities outside Colombia may be subject to foreign health, safety and environmental regulations. Foreign health and safety regulations may be more severe than those established under Colombian law and, therefore, we may be required to make additional investments to comply with those regulations.

Under certain of our credit agreements, we are under an obligation to comply with international environmental standards established by our lenders or by multilateral institutions. Failure to comply with such environmental standards could result in an event of default under the relevant credit agreements that we, or our subsidiaries, have entered into, which would affect our financial condition.

Our operations might be affected by rising climate change and energy transition regulatory developments.

The increase in global temperature due to the substantial increase of GHG is a concern worldwide. The Paris Agreement calls for immediate and forceful actions to be taken to limit the increase of global temperature below 1.5°C. In response, government agendas have increasingly been defining normative and regulatory frameworks that determine local actions related to climate change.

As a result, companies are increasingly subject to regulatory risks and public policy changes related to climate change. For instance, as of December 2020 Colombia announced an ambition goal to reduce carbon emissions by 51% by 2030 as part of its Nationally Determined Contribution (NDC). This national commitment is considered in Ecopetrol's ongoing review of its objectives on emission reductions.

Furthermore, in addition to the carbon tax that Colombia imposed for fuel consumption, of approximately US\$5 per ton of CO₂, in 2022 we expect a National Program of Tradable Quotas of (PNCTE), a type of Emissions Trading System (ETS) to enter into force. Additionally, the Colombian government is planning a regulation on reduction of routine flaring and fugitive emissions. While we expect these to be in line with our current decarbonization policy for the identification, measurement; and correction of fugitive emissions and vents, we can offer no assurance that we will meet the new regulations or that the new regulations will not need to increased costs. Any of the two mentioned effects could negatively impact our financial condition and results of operations.

New or higher taxes resulting from changes in tax regulations or the interpretation thereof in Colombia could adversely affect our results of operations and financial condition.

New tax laws and regulations, and uncertainties in the interpretation with respect to existing and future tax policies pose risks to us. In recent years, the Colombian Congress and tax authorities have enacted modifications to taxes related to financial transactions, income, value added tax (VAT), and taxes on net worth. In December 2018, pursuant to Law 1943, the Colombian Congress enacted a tax reform (the Financing Law), which became effective as of January 1, 2019 and modified the Colombian income tax regime. This Law 1943 was declared unconstitutional as of January 1, 2020 but continued to have full effect until December 31, 2019. In December 2019, Congress passed Law 2101 called "*Ley de Crecimiento Económico*" or "Economic Growth Law" which largely maintains the changes of the previous tax reform along with some changes to tax legislation.

For a description of taxes affecting our results of operations and financial condition in 2019, see section *Financial Review—Effect of Taxes, Exchange Rate Variation, Inflation and the Price of Oil on Our Results—Taxes*. Changes in tax-related laws and regulations, and interpretations thereof, can affect tax burdens by increasing tax rates and fees, creating new taxes, limiting tax deductions, and eliminating tax-based incentives and non-taxed income. In addition, tax authorities and tax courts may interpret tax regulations differently than we do, which could result in tax litigation and associated costs and penalties.

Until 2016, for Colombian income tax purposes, dividends that were distributed from profits taxed at the corporate level were not taxed or subject to withholding tax at the shareholder level. However, beginning in 2017, the regulation changed so that dividends paid to non-resident shareholders are subject to a withholding tax. For further detail and a description of such changes, see section *Financial Review—Effect of Taxes, Exchange Rate Variation, Inflation and the Price of Oil on our Results – Taxes*. Further changes to Colombian tax laws may subject us and our shareholders to higher taxes and could adversely affect our results of operations and financial condition.

We may incur losses and spend time and money defending pending lawsuits and arbitrations and responding to administrative investigations.

We are currently a party to several legal proceedings filed against us. We are also subject to labor-related lawsuits filed by current and former employees in connection with pension plans and retirement benefits. As of December 31, 2020, Ecopetrol S.A. was a party to 5,361 legal proceedings relating to civil, criminal, administrative, environmental, tax, labor claims, of which 3,641 were filed against us in the Colombian courts and arbitration tribunals and of which 234 had an accrual provision. We allocate substantial amounts of money and time to defend against these claims, in which the claimants often seek substantial sums of money as well as other remedies. See Note 22 to our consolidated financial statements and see section [Risk Review—Legal Proceedings and Related Matters](#). In addition, in accordance with Colombian law, we and our employees are subject to surveillance and investigations by certain administrative control entities in Colombia, which are intended to determine whether public funds have been misused, mismanaged or misappropriated or whether they have been used in compliance with applicable law. Such investigations may divert the attention of management and subject the Company to reputational risk and increase difficulties in retaining talent. See section [Risk Review—Legal Proceedings and Related Matters](#).

5.2.4 Risks Related to Our ADSs

This section discusses potential risks associated with an investment in our American Depositary Shares (as opposed to our common shares) by investors outside Colombia.

Holders of our ADSs may encounter difficulties in protecting their interests.

Holders of our ADSs do not have the same voting rights as holders of our common shares. As set forth in the amended and restated deposit agreement, dated December 29, 2017, among Ecopetrol S.A., JP Morgan Chase Bank, N.A., as depositary (the Depositary), and all holders from time to time of our American Depositary Receipts (as amended and restated, the Deposit Agreement), holders of our ADSs may instruct the Depositary, to vote on shareholder matters prior to a shareholders' meeting.

Colombian law is not clear about the need to request proxies from existing shareholders. Thus, holders of our ADSs may not become aware of some matters in time to instruct the Depositary to vote their shares.

The Deposit Agreement provides holders of our ADSs with the right to instruct the Depositary to vote common shares separately. However, holders of our ADRs should be aware that in Colombia, it is uncertain whether a depositary must vote all common shares of a Colombian corporation in an American Depositary Receipt, or ADR, program in the same manner as a single block or may vote them separately. Accordingly, if either the custodian or the Depositary are not able to vote the common shares (including the right to receive common shares in the form of ADRs) deposited under the Deposit Agreement and any other securities, cash or property from time to time held by the Depositary in respect or in lieu of deposited common shares (the Deposited Securities) separately, all such Deposited Securities shall be voted based on the majority vote of the voting instructions timely received from holders of ADRs. In the case of such single block voting, all holders of ADRs, including holders of ADRs for which no voting instructions are timely received and holders of ADRs with voting instructions contrary to the voting instructions of a majority of the Deposited Securities timely received, should be aware that the Deposited Securities shall all be voted as a single block and that the voting instructions of such holders of ADRs will be deemed given in the manner stated above.

The Depositary will not itself exercise any voting discretion in respect of any Deposited Securities. The holders of our ADRs will be solely responsible for any exercise of the voting rights of the Deposited Securities represented by the ADRs if such vote is made pursuant to the procedures described in the Deposit Agreement. Holders of ADRs are strongly encouraged to forward their voting instructions as soon as possible as voting instructions will not be deemed received until such time as the ADR department responsible for proxies and voting has received such instructions, notwithstanding that such instructions may have been physically received by the Depositary, prior to such time.

In the future, the Colombian regulatory authorities may clarify their interpretation as to how the voting rights should be exercised by holders of our ADSs, and such possible interpretation could adversely affect the value of the common shares and ADSs.

Our ADSs holders may be subject to restrictions on foreign investment in Colombia.

Colombia's International Investment Statute (the set of rules and regulations which govern the foreign exchange market and the transactions thereto, which include Decree 1068 of 2015, Resolution 1 of 2018 and External Circular DCIN 83 issued by the Colombian Central Bank among others), regulates the manner in which non-Colombian residents can invest in Colombia and participate in the Colombian securities market. Among other requirements, Colombian law requires foreign investors to register certain foreign exchange transactions with the Colombian Central Bank and outlines the necessary procedures to authorize certain types of foreign investments. Colombian law requires that certain foreign exchange transactions, including international investment in foreign currency between Colombian residents and non-Colombian residents, must be made through the foreign exchange market, either through authorized foreign exchange market intermediaries or compensation accounts, which are regular bank accounts held abroad by Colombian residents and registered with the Colombian Central Bank. Any income or expenses under our ADR program must be made through the foreign exchange market.

Investors acquiring our ADRs are not required to register with the Colombian Central Bank directly, as they will benefit from the registration to be obtained by the custodian for our common shares underlying the ADRs in Colombia. If foreign investors in ADRs choose to surrender their ADRs and withdraw common shares, they must register their investment with the Colombian Central Bank in the common shares as a portfolio investment through their local representative, which may be a brokerage firm, trust company or investment management companies supervised by the Superintendence of Finance. Foreign investors will only be allowed to transfer dividends abroad after their foreign investment registration procedure with the Colombian Central Bank has been completed. Investors withdrawing common shares could incur expenses and/or suffer delays in the application process. The failure of an investor to report or register foreign exchange transactions with the Colombian Central Bank on a timely basis may prevent the investor from remitting dividends abroad or result in the initiation of an investigation and in the imposition of fines.

Colombian residents who acquire ADRs and either receive profits from this investment, surrender their ADRs or liquidate their investment in ADRs, must handle their investment by means of the procedures set forth in section 7.4.1 of the External Regulation of the Circular DCIN-83 of the Colombian Central Bank.

In the future, the Government, the Colombian Congress or the Colombian Central Bank may amend Colombia's International Investment Statute or the foreign investment rules, which could result in more restrictive rules and could negatively affect trading of our ADSs.

Colombia currently has a free convertibility system. If a more restrictive convertibility system is implemented, the Depositary may experience difficulties when converting Colombian Peso amounts into U.S. dollars to remit dividend payments, especially if the foreign investment is not duly registered before the Colombian Central Bank. Also, currently Colombia has a floating exchange rate system that might be subject to change in the future. See section [Shareholder Information—Exchange Controls and Limitations](#).

Holders of our ADSs may not be able to effect service of process on us, our directors or executive officers within the United States, which may limit your recovery in any foreign judgment you obtain against us.

We are a mixed economy company organized under the laws of Colombia. In addition, most of the members of our Board of Directors (Directors) and executive officers reside outside the United States. All or a substantial portion of our assets and the assets of these persons are located outside of the United States. As a result, it may not be possible for ADSs holders to effect service of process within the United States upon us or these persons or to enforce judgments against us or them in U.S. courts obtained in such courts predicated upon the civil liability provisions of the U.S. federal securities laws. Colombian courts determine whether to enforce a U.S. judgment predicated on the U.S. securities laws through a procedural system known as *exequatur*. For a description of these limitations, see section [Shareholder Information—Enforcement of Civil Liabilities](#).

The protections afforded to minority shareholders in Colombia are different from those in the United States, and may be difficult to enforce.

Under Colombian law, the protections afforded to minority shareholders are different from those in the United States. In particular, the legal framework with respect to shareholder disputes is substantially different under Colombian law than U.S. law and there are different procedural requirements for commencing shareholder lawsuits, such as shareholder derivative suits. As a result, it may be more difficult for our minority shareholders to enforce their rights against us or our Directors or controlling shareholder than it would be for shareholders of a U.S. company.

ADRs do not have the same tax treatment as other equity investments in Colombia.

Although ADRs represent Ecopetrol's common shares, for Colombian tax purposes, ADRs are securities different from their underlying assets. Therefore, ADR holders are not entitled to the tax treatment granted to holders of the common shares. Such tax treatment includes, among others, benefits relating to dividends and to profits derived from sale of Colombian common shares. For further information, see section [Shareholder Information—Taxation—Colombian Tax Considerations](#).

Judgments of Colombian courts with respect to our ADSs will be payable only in Colombian Pesos.

If proceedings are brought in the courts of Colombia seeking to enforce the rights of ADS holders of common shares, we will be required to discharge our obligation amounts in Colombian Pesos. Colombian law provides that an obligation in Colombia to pay amounts denominated in foreign currency may only be satisfied in Colombian currency at the Representative Market Exchange Rate of the date the judgment is obtained, and such amounts are then adjusted to reflect exchange rate variations through the effective payment date.

The relative volatility and illiquidity of the Colombian securities markets may substantially limit our investors' ability to sell our ADSs at the price and time they desire.

Investing in securities that are traded in emerging markets, such as Colombia, often involves greater risk when compared with other world markets, and these investments are generally considered to be more speculative in nature. The Colombian securities market is substantially smaller, less liquid, more concentrated and can be more volatile than other securities markets in the United States. As of December 31, 2020, the Colombian Stock Exchange (BVC) had a market capitalization of approximately COP\$365,657 billion (US\$105 billion using the closing rate for 2020), a 16% decrease when compared with the amount at the end of 2019, a daily average trading volume of approximately COP\$122,752 million (US\$33 million, using the average exchange rate for 2020), a 14% decrease when compared with the volume in 2019. By comparison, the New York Stock Exchange (the NYSE) had a market capitalization of US\$32.6 trillion as of December 31, 2020, and a daily trading volume of approximately US\$182.7 billion in 2020.

As of December 31, 2020, our shares represented the highest market capitalization of the BVC accounting for 11% of the total COLCAP index, which reflects the price volatility of the 20 most-liquid stocks.

Given the current ownership structure of our shares, it may be difficult for you to purchase large quantities of shares from a single shareholder. We cannot assure you that a liquid trading market for our ADSs will develop or, if developed, that it will be maintained. Without a liquid trading market, the ability of investors in our ADSs to sell them at the desired price and time could be substantially limited.

We are not required to disclose as much information to investors as a U.S. issuer is required to disclose.

We are subject to the reporting requirements set by Law 964 of 2005, the Superintendence of Finance and the BVC - (Colombian Stock Exchange). The corporate disclosure requirements that apply to us may not be equivalent to the disclosure requirements that apply to a U.S. issuer and, as a result, you may receive less interim information about us than you would receive from a U.S. issuer.

5.2.5 Risks Related to the Controlling Shareholder

Our controlling shareholder's interests may be different from those of certain minority shareholders.

The Nation currently holds 88.49% of our outstanding capital stock, making it our controlling shareholder. The Nation as our controlling shareholder has majority voting rights at the General Shareholders Assembly to elect the members of our Board of Directors and may propose and approve decisions that may be in its own interest and that may not necessarily benefit minority shareholders.

Our controlling shareholder may suggest and approve dividend proposals at the ordinary General Shareholders Assembly, notwithstanding the interest of certain minority shareholders, in an amount that results in us having to reduce our capital expenditures or increase our debt levels, thereby negatively affecting our prospects, results of operations and financial condition. See the section [Shareholder Information—Dividend Policy](#).

Additionally, our controlling shareholder may undertake projects, approve decisions or make announcements about its intentions related to its holding of the Company's stock, which may not be in our best interest or in the best interest of our minority shareholders, including holders of our ADSs, and could affect the price of our shares or ADSs.

5.3 Risk Management

5.3.1 Integrated Risk Management System and Internal Control System

Under the leadership of the Vice-Presidency of Compliance, in 2020 Ecopetrol S.A. strengthened its Integrated Risk Management System based on the international technical standard ISO 31000, which establishes a set of principles, frame of reference and process or cycle that allow the organization to manage the effects of uncertainty on meeting objectives, in order to maximize opportunities and assist in establishing strategies and making informed decisions.

Our risk management approach is based on the risk management which consists of four main stages: planning, identifying, evaluating, and managing risks, as well as cross-cutting stages of communication and consulting, record and reporting and monitoring. This cycle is supported by the principles of risk management: integration, continuous improvement, structure, information, culture, organizational structure and normative and management tools.

Three of our most important tools within our risk management approach are:

- i. **Risk Assessment Methodology:** In order to properly prioritize mitigation, treatment and monitoring efforts of risk management at the process level, a standardized methodology was established to assess inherent and residual risk levels. The risk level (Very High, High, Medium, Low or None) is obtained from the combination of the risks (impacts) and the probability of occurrence of those consequences. According with the level of risk, action plans for management and mitigation are defined.
- ii. **Mitigation Plans:** Each year, by performing the stages of the risk management cycle, we define and implement mitigation plans in order to reduce the levels of exposure to risk through mitigation or elimination of some of its causes. Metrics and goals must be defined during the development of each plan to ensure its effectiveness and to prioritize our efforts on those with the greatest impacts.
- iii. **Monitoring Indicators:** As part of the monitoring stage of the risk management cycle, Ecopetrol has implemented Key Risk Indicators (KRIs) which are metrics used to provide early signals of increasing risk exposures. These signals constitute information for preventative decision making in order to avoid risk materialization.

The Integrated Risk Management System establishes the definition of risk as the effect of uncertainty on the fulfillment our objectives, considering the effect as the deviation positive, negative or both, compared to what is expected. Our risks can be classified as:

- i. **Enterprise Risks:** These are those risks that are directly associated with the business strategy plan of the Company and are systematically monitored by the Management Committee. When defining the enterprise risks, the analysis of the internal and external environment is carried out to determine the topics and trends that could have potential or real impact on Ecopetrol's strategy. Emerging risks are selected from those trends, and they are included in the enterprise risks as a new risk or as a cause of existing enterprise risk. Further information can be found in Ecopetrol's 2020 Enterprise Risk Map which is available on our website at: <https://www.ecopetrol.com.co/wps/portal/Home/es/NuestraEmpresa/%C3%89tica%20y%20Transparencia/GestionDeRiesgos>.

The management of those risks is led by the person accountable for the process and each risk has a defined treatment plan and monitoring indicators.

- ii. **Processes Risks:** These are those risks that tend to identify potential failures in the activities related to our core and support business processes that drive us to achieve our objectives. At this level, our processes have identified risks with their respective mitigation methods, including financial and non-financial controls, treatment plans and/or monitoring indicators.
- iii. **Operational Risks:** These are those risks that are at an operational level of detail and occur in our day-to-day activities and tasks.

Ecopetrol has also continued consolidating its internal control systems into a unified system that integrates the best practices called for by the Committee of Sponsoring Organizations of the Treadway Commission (COSO 2013), Sarbanes–Oxley Act (SOX), governance and management of enterprise IT (COBIT), Enterprise Risk Management (COSO 2017) and our ethics and compliance rules, with the aim of establishing an integrated management system for all control components, thereby allowing us to strengthen all of our control system.

Ecopetrol has also defined guidelines and implemented an Internal Control System (which includes subsidiaries), the main purpose of which is to provide reasonable assurance regarding the achievement of all of the Company's objectives relating to operations, strategy, reporting and compliance, through the appropriate risks management and ensuring the effectiveness of its controls and the scope of which includes its subsidiaries. Under those guidelines, each subsidiary must implement and report the performance of its Internal Control System to Ecopetrol S.A. to ensure compliance with the above measures, and the subsidiaries have methodological support from Ecopetrol S.A. when requested. Ecopetrol S.A. also performs preventive monitoring in selected subsidiaries to assure all the components and principles of their Internal Control Systems are present and operating. The system performance is systematically monitored by the Board of Directors.

The risk management component of our Internal Control System is in charge of identifying negative events or situations that may affect our defined objectives, assessing and prioritizing them to implement the most appropriate response. This component has been designed and implemented across the organization, with a two-level focus: Enterprise Risk and Processes Risks.

Ecopetrol S.A.'s Internal Control System is aligned to the Company's strategy and business processes and gives responsibility to all employees to manage risk, to maintain the effectiveness of controls, to report incidents in order to preventively correct possible deficiencies and to provide reasonable assurance of achieving corporate objectives and goals. The scope of this system includes the Company's subsidiaries who must implement and report on the performance of its internal control system to the Company to ensure compliance with the above measures.

5.3.2 Managing Low Carbon Economy and Climate Change Risks

To manage and mitigate the risks related to the transition to a low carbon economy and climate change, Ecopetrol, as part of its energy transition and decarbonization activities, expects to invest approximately US\$ 600 million in the next three years in projects that aim to meet our mitigation targets. Additionally, Ecopetrol has set a shadow price on carbon at US\$ 20/TCO₂ in 2021, 30 USD/TCO₂ from 2025, and 40 USD/TCO₂ from 2030 onwards, which will be used to assess and evaluate current and future projects and investments. See the section entitled [Business Overview—Environmental, Social and Governance \(ESG\) Strategies and Initiatives—Environmental sustainability](#) for detailed information on our strategy and carbon shadow price.

To properly adapt the Ecopetrol Group's business strategy to the transition to a low carbon economy for ensuring long-term value creation, Ecopetrol has been conducting energy transition scenario analysis since 2018. These analyses are being updated and refined reflecting two elements: i) the acceleration of the transition in recent years given a reduction of costs of electrification and renewables earlier than expected, accompanied by increasing oil price volatility and decreased investment appetite in the hydrocarbon sector; and ii) decrease in the demand for oil & gas brought by the COVID-19 pandemic. We have assumed a peak oil scenario (globally in the late 2020s and in Colombia between the 2030s and 2040s), to reflect more ambitious actions and goals in the decarbonization path and to seize the opportunities of the transition. Our climate risk strategy is being aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and includes the addition of a new climate-related risk to our 2020 enterprise risks, in respect of inadequate management of climate change and water. This risk complements the risk of not responding to the new low carbon economy.

See the section entitled *Strategy and Market Overview—Our Corporate Strategy* for more details about our energy transition roadmap.

5.3.3 Managing Information Security and Cybersecurity

Ecopetrol S.A. has a dedicated management team focused on information security issues such as risk analysis, treatment of information, safe information management practices and classification of critical business information, control systems compliance and effectiveness of available information security technologies, all of which are articulated with the ERM system at the enterprise level. The Cybersecurity unit is part of the Digital Vice-presidency, reporting to senior management and to the Company's Board of Directors.

Ecopetrol S.A. has included cybersecurity risk as one of the key enterprise risks. Based on that, a working group formed in 2014, coordinated by the cybersecurity area with the participation of industrial control systems and information technology specialists, has been understanding the new challenges of cybersecurity risk, developing activities to identify and protect critical digital assets.

During 2019, Ecopetrol S.A., as a NOC (National Oil Company), provided updates to the Cyber Defense Command Unit (an entity under the control of the Colombian Ministry of Defense) regarding the inventory of its critical cybernetic infrastructure that was included in the classified catalogue of national critical cybernetic infrastructure. In 2020, no such updates were provided.

Ecopetrol's cybersecurity team established a plan to continue the incorporation of cybersecurity practices to enhance the awareness about these risks at an operational level and adjust current information security practices considering the cyber-threat context. Likewise, as a result of this process, we are currently continuing the incorporation of elements relative to management of the cyber security threat, including proper configuration of storage devices, overall control of information security, policies and procedures that address trading information security, control mechanisms for remote work, specialized monitoring and cyber threat services, vulnerability management, cyber incident response management and cybersecurity insurance coverage, among others.

Ecopetrol S.A. has a Security Operations Center (SOC) service, in order to enhance the ability to foresee and identify trends in attacks in Ecopetrol S.A.'s information technology infrastructure and to monitor Ecopetrol's reputation on the internet. During 2020, Ecopetrol strengthened the SOC by incorporating updated capabilities, expanding the scope of services to Operational Technology (OT) digital assets, conducting redteam exercises and improving monitoring coverage. While there were cyber-attacks during 2020, every event was controlled and there were no material effects on processes, equipment, products, services, relationships with customers or suppliers, competitive conditions or critical information. Ecopetrol S.A. does not have any current proceedings that relate to cyber breaches.

Furthermore, during 2020, the internal audit department conducted audits on cybersecurity processes following up on our prior enhancement plans. As a result of the aforementioned, an action plan was adopted in 2020. The primary goal of the plan was to reinforce our cybersecurity culture and refine certain technical components of our cybersecurity program. Ecopetrol S.A. also recently updated its cybersecurity policies and cyber incidents response procedure which was tested in several wargames exercises covering all business segments and their subsidiaries.

During the first quarter of 2020, in response to the requirements derived from the COVID-19 pandemic, Ecopetrol S.A. updated its cybersecurity risk profile and its cybersecurity strategy, which now covers ensuring connectivity for teleworking, remote work and articulation with the migration into the cloud for critical applications and all of the Ecopetrol Group companies. Likewise, Ecopetrol S.A. strengthened its capabilities to monitor and response against malicious activities.

Ecopetrol uses the ONG-C2M2 (Oil & Gas - Cybersecurity Capability Maturity Model) as a framework to manage its cybersecurity maturity and to establish its Cybersecurity Program and its Cybersecurity Management System, implementing practices and capabilities those covers the following domains: Risk Management, Asset Change and Configuration Management, Identity and Access Management, Threat and Vulnerability Management, Situational Awareness, Information Sharing and Communications, Event and Incident Response - Continuity of Operations, Supply Chain and External Dependencies Management, Workforce Management and Cybersecurity Program Management.

Finally, in order to update the cybersecurity strategy for 2021 to 2023, Ecopetrol S.A. formulated an approach to strengthen its cybersecurity program, in which the Cybersecurity Capability Maturity Model (C2M2) framework will be complemented with zero trust practices and a set of advanced protection controls for critical information (military grade), with focus on the reduction of cyber risk level in business units and the increase of the cultural awareness in cybersecurity terms.

5.3.4 Managing Financial Risk

We are exposed to certain risks associated with the nature of our operations and the financial instruments we use. Among the risks that affect our financial assets, liabilities and expected future cash flows are changes in commodity prices, currency exchange rates, interest rates and the credit quality of our counterparties.

Commodity price risk is associated with our day-to-day operations as we export and import crude oil, natural gas and refined products. We occasionally use hedges to partially protect our financial results from price fluctuations taking into account that part of our financial exposure under purchase contracts for crude oil and refined products depends on international oil prices. We believe that the risk of such exposure is partially naturally hedged since we are an integrated group (with operations in the upstream, midstream and downstream segments) and either export crude oil at international market prices or sell refined products at prices that are correlated to international market prices. During 2020, Ecopetrol S.A. executed strategic and tactical hedging operations due to its exposure to pricing indices different from the commercialization benchmark and different pricing periods between the buying and the selling of physical barrels. We do not use derivative financial instruments for speculative or profit-generating purposes. A total of 30 million barrels (mmbbls) were the subject of strategic hedges oriented at protecting the Ecopetrol's income and cash flow, limiting losses, covering production costs and avoiding potential closures of production fields; for this purpose. A total of 21.7 million barrels (mmbbls) were the subject of tactical hedges oriented at mitigating risks associated with storage marketing strategies, anticipated purchases of raw materials, supply to refineries, international sales delivered at the destination port and exports of heavy fuel oil.

Currency risk arises in our operations given the fact that most of our revenues are derived from sales of products quoted in or with reference to U.S. dollars. Therefore, when the Colombian Peso depreciates against the U.S. dollar, our revenues converted into Colombian Pesos increase. Conversely, when the Colombian Peso appreciates against the U.S. dollar, our revenues decrease. On the other hand, imported goods, oil services and the debt, which is mainly denominated in U.S. dollars, become less expensive when the Colombian Peso appreciates against the U.S. dollar and more expensive when the Colombian Peso depreciates against the U.S. dollar.

As of December 31, 2020, our U.S. dollar-denominated total debt principal was US\$12.3 billion, which we recognize in our consolidated financial statements at its amortized cost, which corresponds to the present value of cash flows, discounted at the effective interest rate. Out of this total, a principal US\$11.8 billion relate to Ecopetrol S.A., whose functional currency is the Colombian Peso. Therefore, when the Colombian Peso depreciates against the U.S. dollar, Ecopetrol S.A. is exposed to an exchange rate loss. In contrast, when the Colombian Peso appreciates against the U.S. dollar, Ecopetrol S.A. is exposed to an exchange rate gain. Some of the Ecopetrol Group's subsidiaries have the U.S. dollar as functional currency and are not exposed to a material exchange rate risk resulting from fluctuations in the Colombian Peso against the U.S. dollar. On the asset side, when the financial statements of the Ecopetrol Group are consolidated, the exchange rate differential of the subsidiaries' assets and liabilities whose functional currency is the U.S. dollar is recognized directly in equity, as part of other comprehensive income.

Taking previous considerations into account, Ecopetrol seeks to identify and manage currency risk in a comprehensive manner, using an integrated analysis of natural hedges in order to benefit from the correlation between incomes or investments in a foreign operation and debt denominated in foreign currency. The Company adopted hedge accounting as part of its risk management strategy, using two types of natural hedges with its U.S. dollar denominated debt as a financial instrument: i) cash flow hedge for exports of crude oil and ii) hedge of a net investment in a foreign operation. In addition, the Company may involve the use of financial derivative instruments, and non-derivative financial instruments. As a part of its risk management strategy, using the natural hedge between exports and dollar-denominated debt, on October 2015, US\$ 5.4 billion of Ecopetrol S.A.'s debt in U.S. dollars was designated as hedge instrument of its future export sales for the period 2015 – 2023. In June 2016, Ecopetrol continued its hedge accounting strategy, using the natural hedge between some of its foreign investments and its dollar-denominated debt in an amount of US\$5.2 billion. Likewise, in November 2019 Ecopetrol hedged a new portion of the dollar-denominated debt against its new investment in the U.S. Permian Basin in an amount of US\$0.93 billion and during 2020 Ecopetrol hedged US\$1.22 billion with its foreign investments.

As of December 31, 2020, the outstanding value of the natural accounting hedges was US\$8.5 billion. With the adoption of hedge accounting, the effect of the volatility of the foreign exchange rate on the hedged portion of the debt is recognized directly in equity, as part of other comprehensive income. In addition, the Company entered into financial derivative instruments in order to mitigate the impact of exchange rate volatility on its financial statements by selling US dollars in order to fulfil Colombian peso denominated debt obligations.

The remaining portion of our dollar-denominated debt, as well as the financial assets and liabilities denominated in foreign currency continue to be exposed to the fluctuation of the exchange rate, which means that an appreciation of the Colombian peso against the U.S. dollar could generate a loss if companies whose functional currency is the Colombian peso have an active net position in U.S. dollars or a gain if they have a net liability position in U.S. dollars. Conversely, a depreciation of the Colombian peso against the U.S. dollar could generate a gain if companies whose functional currency is the Colombian peso have a net active position in U.S. dollars or a loss if they have a net liability position in U.S. dollars. Finally, the Company maintains enough cash in Colombian pesos and U.S. dollars to meet its expenses in each currency (see Note 4.1.5 to our financial statements for further explanation of our accounting policy and Note 30.1 for details of the hedge accounting adopted). With the adoption of hedge accounting, the effect of volatility of foreign exchange rate on the effective hedged portion of the debt is recognized directly in equity, as part of other comprehensive income. Our hedge management strategy is completely focused on our accounting, reason why the ultimate effect will only be determined when the hedge operations come to an end.

Interest rate risk arises from our exposure to changes in interest rates mainly as a result of the issuances of floating rate debt linked to LIBOR, DTF, CPI and IBR (with a participation of 8.3%, 1.8%, 2.5% and 1.0%, respectively, of the nominal debt balance as of December 31, 2020). Thus, volatility in interest rates may affect the fair value of and cash flows related to our investments and floating rate debt. In 2020, our analysis of credit risk events and global financial markets drove us to decide not to hedge interest rate risk. Nevertheless, our capital markets office continuously monitors the performance of interest rates and the effect of interest rates on our financial statements.

The trust funds linked to Ecopetrol S.A.'s pension obligations (PAP for its acronym in Spanish) are also exposed to changes in interest rates, as they include fixed- and floating-rate instruments that are mark to market. This exposure is continuously monitored by our treasury office given the potential impact volatility may have on our financial results. The treasury office's information is gathered from reports provided by the asset managers. These reports refer to regulatory limits as well as market, credit and liquidity risks. The investment guidelines with respect to the PAPs are issued by the Colombian regulation for pension funds, as stipulated in the Decree 1833 of 2016 and Decree 1913 of 2018, where it is indicated that they have to follow the same regime as the regular obligatory pension funds in their moderate (*i.e.*, neither conservative nor aggressive) portfolio. For further information regarding the trust funds linked to the pension obligations of the company, see Note 22.2 Plan assets to our consolidated financial statements.

Regarding liquidity risk, Ecopetrol forecasts and monitors its cash position on a daily basis in order to review updated expectations for liquidity conditions and the capacity to attend short term obligations. This forecast mainly includes operational income and expenses, capital expenditures expectations, debt and dividend related cash-flows, and other financial cash movements. Additionally, on a monthly basis, management reviews cash evolution, availability and forecasts under different scenarios.

Finally, counterparty risk is the potential probability that a borrower or counterparty defaults on any obligation. In our case, we are exposed to this risk as we invest in different financial instruments and receive letters of credit in order to mitigate our exposure with our commercial counterparties. We manage this risk by monitoring and analyzing the counterparty's creditworthiness, stock price behavior, spreads on credit default swaps, probability of default, among others.

Hedging guidelines for Ecopetrol S.A. and its subsidiaries

Ecopetrol S.A.'s management established a set of guidelines for hedging strategies for Ecopetrol S.A. and its subsidiaries. These guidelines allow us to use financial instruments in order to mitigate the impacts in Ecopetrol's financial statements as a result of the fluctuation of risk factors, such as commodity prices, exchange rate, interest rate and others.

These guidelines determine general principles governing hedging operations, corporate governance, the process for implementing operations which includes the identification of risk exposition as an integrated group, the identification and design of the financial structures, and execution and monitoring, among others.

The guidelines also include a list of allowable financial assets, such as forwards, futures, options and swaps and describe the differences between strategic and tactical hedging, where the former focus on protecting our financial results from market volatility and the latter is mainly designed to hedge the market risk of specific trading in physical markets.

Investment Guidelines Ecopetrol S.A.

Ecopetrol S.A.'s management established guidelines for our investment portfolios. These guidelines determine that investments in Ecopetrol S.A.'s U.S. dollar portfolio and the Colombian Peso portfolio may be invested in fixed income securities issued by entities with a rating equal to or greater than Ecopetrol S.A.'s credit risk rating, but which at all times must be a minimum of investment grade as rated by any of the internationally recognized rating agencies (Standard & Poor's, Moody's, and Fitch Ratings). In order to diversify risk in both our U.S. Dollar and Colombian Peso portfolios, Ecopetrol S.A.'s management will determine both short- and long-term limits by issuer and issuance based on internal analyses and external risk ratings.

Additionally, the portfolios in U.S. Dollar and Colombian Peso of Ecopetrol S.A. will be segmented in the tranches determined by Ecopetrol S.A.'s management, meeting the Company's working capital and liquidity needs, benchmarks and cash flow projections.

5.4 Legal Proceedings and Related Matters

We are a party to various legal proceedings in the ordinary course of business. Other than the proceedings disclosed in this annual report, we are not involved in any pending (or, to our knowledge, threatened) litigation or arbitration proceeding that we believe will have a material adverse effect on our Company. Other legal proceedings that are pending against or involve us and our subsidiaries are incidental to the conduct of our and their business. We believe that the ultimate disposition of such other proceedings individually or in an aggregate basis will not have a material adverse effect on our consolidated financial condition or results of operations.

As of December 31, 2020, Ecopetrol S.A. was a party to 5,361 legal proceedings relating to civil, criminal, administrative, environmental, tax and labor claims, of which 3,641 were filed against us in the Colombian courts and arbitration tribunals, of which 234 had an accrual provision. We allocate sufficient amounts of money and time to defend these claims. Historically, we have been successful in defending lawsuits filed against us. Other than the environmental administrative proceedings described in the last paragraph of this section, based on the advice of our legal advisors, it is reasonable to assume that the litigation procedures brought against us will not materially affect our financial position or solvency regardless of the outcome. See Note 23 to our consolidated financial statements included in this annual report for a discussion of our legal proceedings.

Caño Limón – Coveñas Crude Oil Pipeline Spill

On December 11, 2011, the Caño Limón - Coveñas oil pipeline ruptured and caused the spill of approximately 3,267 barrels of crude oil into the Iscala creek, which connects with the Pamplonita River that provides water to the city of Cúcuta. The incident did not cause any fatalities or injuries.

A class action lawsuit has been filed against Ecopetrol S.A. and against employees of the company, and the First Administrative Court has jurisdiction to conduct the case, which is in the probatory stage.

The Regional Environmental authority of Norte de Santander, or Corporación Autónoma Regional de la Frontera Nororiental (CORPONOR) has filed a lawsuit against Ecopetrol at the Administrative Court of Norte de Santander claiming for (i) the environmental loss caused by the incident and (ii) for compensation costs relating to the environment damage for approximately COP\$33 billion. Ecopetrol's legal counsel filed to dismiss the lawsuit on June 2, 2014, based on three grounds: (i) there is no proof of environmental loss, (ii) CORPONOR does not have the authority to file this lawsuit and (iii) CORPONOR's petition for direct compensation is not the proper legal action according to the applicable procedural rules. Currently this lawsuit is in the evidentiary stage. In July 2020 the evidentiary stage closed and we are awaiting a ruling in the first instance.

Ecopetrol and national and local authorities convened to develop a project consisting of an alternative to the water supply intake of the aqueduct in Cúcuta, The Company's Board of Directors in December 2011 approved the participation of Ecopetrol in the project as part of the strengthening of its contingency plans and its relationship with its stakeholders. On November 10, 2017, the relevant parties entered into an agreement with the purpose of building the alternative water supply at a cost of approximately COP\$385 billion. According to the agreement Ecopetrol will be in charge of the construction of the above-mentioned infrastructure. As of the date of this annual report, Ecopetrol has awarded two construction contracts. For the initial segment of the project and a second construction contract for a subsequent segment is soon to be awarded. The corresponding auditing contract has also been awarded.

BT Energy Challenger

On October 22, 2014, we were served with a class action suit against us seeking monetary damages of approximately COP\$7.4 trillion related to an incident that occurred on August 21, 2014, during the loading operations of the BT Energy Challenger vessel. The claimants alleged possible damage to the port area of Ecopetrol's terminal in Coveñas, as well as of marine and submarine areas and beaches that form the geographical area of the Morrosquillo Gulf. This allegation is currently under investigation by the Harbor Master of Coveñas. Ecopetrol filed a motion requesting the judge to require the claimants to amend their claim to more precisely set forth the facts and evidence it believes establishes Ecopetrol's liability.

On March 3, 2015, Ecopetrol filed its statement of defense arguing the exclusive fault of a third party. On October 20, 2015, the Court denied a class action of more than 100 informal traders in the region because there is no common identity with the initial class (hotel employees). However, during 2016 the Sucre Administrative Court accepted another 1,208 informal traders and fishermen as claimants.

On March 10, 2017, a mandatory conciliatory hearing was held in order to seek an agreement, but it failed.

In January 2018, a judicial order was issued to commence the evidence gathering process, a decision which was objected by the parties.

In September 2018, all the ordered statements were made, the evidentiary stage was finalized and the parties filed their final closing briefs. As of the date of this annual report the case remained pending.

As of the date of this annual report, the claims have decreased to COP\$7.3 trillion, as a result of the reconsideration of the amount initially requested and the inclusion of new claimants in the process.

PetroTiger

As highlighted in previous 20-F and 6-K filings, on January 6, 2014, the United States Department of Justice (DOJ) announced the unsealing of charges against two former co-chief executive officers (CEOs) and the former general counsel of PetroTiger Ltd. (PetroTiger), alleging, among other things, violations of the U.S. Foreign Corrupt Practices Act (FCPA) and conspiracy to commit violations of the FCPA and money laundering in connection with payments made to an Ecopetrol employee. By the time of the DOJ announcement, that employee no longer worked at the Company. The DOJ alleged the payments were made to secure Ecopetrol's approval for PetroTiger's entry into an oil services contract with Mansarovar Energy Colombia Ltd. Ecopetrol participated in the Mansarovar project as non-operating partner in a joint operating agreement. Also on January 6, 2014, the DOJ announced that the general counsel of PetroTiger had pled guilty on November 8, 2013, to one count of conspiracy to violate the FCPA and to commit wire fraud. One of the charged former co-CEOs pleaded guilty on February 18, 2014, to the same charge. On May 9, 2014, the DOJ charged the other former co-CEO with conspiracy to violate the anti-bribery provisions of the FCPA, conspiracy to commit wire fraud, conspiracy to launder money, and substantive FCPA anti-bribery and money laundering violations. On June 15, 2015, that co-CEO pleaded guilty to conspiracy to violate the FCPA.

After the DOJ unsealed its charges on January 6, 2014, Ecopetrol filed a complaint the same month, jointly with the Transparency Secretariat of the Presidency of the Republic, to Colombia's Attorney General's office requesting the investigation of individuals who may have been involved in the wrongdoing related to the Mansarovar contract. Colombian authorities initiated a proceeding related to PetroTiger, and on March 11, 2015, arrested four current Ecopetrol employees and two former Ecopetrol employees related to their investigation of the Mansarovar project and five other contracts involving PetroTiger and Ecopetrol. To date, four investigations of the control entities continue in course. During 2017 and 2018 to date, Colombian authorities have resolved an appeal confirming the conviction of a former Ecopetrol employee and another person involved in the case but not linked with Ecopetrol. Likewise, two other appeals are in progress, one of them submitted by Ecopetrol and the Prosecutor's Office in a case in which a former Ecopetrol employee was acquitted, and the other submitted by the defense attorney of a former Ecopetrol employee in a case in which the employee pleaded guilty.

Ecopetrol has responded to information requests from the DOJ and Colombian authorities in connection with their investigations of PetroTiger. Ecopetrol has been designated with the formal status of victim in the local Colombian proceedings. It has terminated the employment of the four charged individuals who were Ecopetrol employees at the time of the arrests. Ecopetrol has concluded an internal investigation and has not identified any new issues relating to PetroTiger.

Salgar-Cartago Multi-purpose Pipeline Spill

On December 23, 2011 our Salgar-Cartago pipeline ruptured. Internal and external experts believe this incident occurred as a result of creep movement of soil caused by severe weather conditions, causing the soil surrounding the pipeline to exert strong pressure on the pipeline and rupture it. As of the date of this annual report, there are four lawsuits related to this incident with possible damages of approximately COP\$6.95 billion.

Class action of the AWA Indigenous Community

On April 2, 2018, a class action lawsuit was filed against Ecopetrol and CENIT by the Inda Guacaray and Inda Sabaleta reservations of the AWA Indigenous community who claim damages to their communities by environmental contamination and damage to natural resources that the defendants supposedly caused by act or omission during various environmental incidents. In August 2018 Ecopetrol answered the complaint. The parties are currently waiting for the evidentiary stage to start.

On November 14, 2020, the Administrative Court of Cundinamarca declared that an inadequate claim was filed by the AWA community, considering that the claims related to the reestablishment of measures specific to restitution, rehabilitation, satisfaction and guarantees of non-repetition, could not be sought through a class action.

The foregoing implies that Ecopetrol, along with the National Agency for Legal Defense of the State (*Agencia Nacional de Defensa Jurídica del Estado* or ANDJE) and CENIT, need to recalculate the amount of the claims based on the decision of the Administrative Court of Cundinamarca.

Although the plaintiffs did not clearly determine the amount of their claims, Ecopetrol and the National Agency for Legal Defense of the State (*Agencia Nacional de Defensa Jurídica del Estado* or ANDJE) had initially estimated the amount to be approximately COP\$358,201,371,800. However, based on the November 14, 2020 decision, Ecopetrol, ANDJE and CENIT, need to recalculate the amount of the claims.

As of the date of this annual report, the court has not yet set a hearing date.

On March 18, 2019, Ecopetrol received judicial notice of a lawsuit filed by workers and former workers seeking if between 1997 and 2017 the company allocated part of its profits for the wellbeing of their workers. The plaintiffs considered that they had the right to receive those profits up to COP \$ 3,157,461,510,000. This lawsuit is similar the one that was ruled on behalf of Ecopetrol in 2011.

The lawsuit is in the evidentiary stage and on February 10, 2021, a hearing will be held to collect evidence, hear the parties' final closing briefs and the court will issue the final ruling.

Environmental Administrative Proceedings

As of December 2020, Ecopetrol S.A. was party to 211 environmental administrative proceedings, of which 185 were initiated before 2020 and 26 during 2020. It is not possible for us to determine whether the pending proceedings could have a material effect on Ecopetrol. During 2020, 50 proceedings were concluded, in two of them we were subject to monetary fines through resolution 0710-0667 of 2020, in the aggregate amount of COP \$265.836.101 and resolution 0052 of 2020, in the aggregate amount of COP\$5.155.203.368, with the latter pending a final decision by the Environmental Authority.

Reficar Investigations

Reficar is a wholly owned subsidiary of Ecopetrol. According to Colombian regulations, Ecopetrol's and Reficar's employees are considered public servants, and as such can be held liable for negligent use or management of public resources. In this context, given that Ecopetrol is majority owned by the Colombian Government and Reficar is a wholly owned subsidiary of Ecopetrol, Ecopetrol and Reficar administer public resources.

As a result, Ecopetrol and Reficar employees are generally subject to the control and supervision of the following control entities, among others:

The Office of the Comptroller General (*Contraloría General de la República*) oversees the adequate use of public resources and has the authority to investigate public employees or private sector employees that use or manage public resources.

The Attorney General's Office (*Procuraduría General de la Nación*) supervises compliance with applicable law by public employees and private sector employees that carry out public functions. The Attorney General's Office investigates and disciplines individuals for compliance failures.

The Prosecutor's Office (*Fiscalía General de la Nación*) investigates potential crimes and prosecutes alleged crimes before the court in judicial proceedings.

The following are the most significant investigations and proceedings carried out by the aforementioned state entities:

1. The Office of the Comptroller General's investigations and proceedings.
 - 1.1 Because of the modifications of the schedule and budget related to Reficar's expansion and modernization project (the Project), the Office of the Comptroller General initiated a special audit investigation of the Project in 2016 and delivered a final report to Reficar on December 5, 2016. The report detailed 36 findings most of which were related to increased costs compared to budget for services, labor and materials. As required, on January 18, 2017, Reficar submitted an action plan addressing the 36 findings in the following areas: (i) contract management, (ii) supervision of engineering standards contracted with third parties, and (iii) documentation of the control, reporting and monitoring mechanisms of subcontracts.
 - 1.2 As a result of the findings described above, on March 10, 2017, the Office of the Comptroller General opened actions for financial responsibility (proceso de responsabilidad fiscal) against 36 individuals and the six companies involved in the Project, including former members of Ecopetrol's Board of Directors, former members of Reficar's Board of Directors, former employees of Ecopetrol, and former employees of Reficar, as well as Chicago Bridge & Iron Company N.V., CBI - Chicago Bridge & Iron company (CB&I) Americas Ltd., Chicago Bridge & Iron Company CB&I UK Limited, CBI Colombiana S.A., Foster Wheeler USA Corporation and Process Consultants Inc.

These actions were initiated based on the Office of the Comptroller General's theory that lower than expected profitability at Reficar could have been caused by (i) modifications to the schedule and, (ii) the increase of the budget for the Project.

On June 5, 2018, the Office of the Comptroller General split the initial proceeding in two. The first one is related to the increase of the Project's budget and the second one is related to the modifications in the Project's schedule.

Regarding the first proceeding, on June 5, 2018, the Office of the Comptroller General issued charges for financial responsibility (*proceso de responsabilidad fiscal*) against (i) 15 individuals, which include former members of Reficar's Board of Directors, a former employee of Ecopetrol, and former employees of Reficar, as well as against (ii) CBI - Chicago Bridge & Iron company (CB&I) Americas Ltd., Chicago Bridge & Iron Company CB&I UK Limited, CBI Colombiana S.A., Foster Wheeler USA Corporation and Process Consultants Inc, and the following insurance companies, Compañía Aseguradora de Fianzas S.A, Coaseguro Confianza S.A. , Liberty Seguros S.A., CHUBB de Colombia Compañía de Seguros S.A., Seguros Colpatría S.A. and Mapfre Seguros Generales de Colombia S.A., as third parties with joint liability.

As for the other 21 individuals initially investigated in 2017, the Office of the Comptroller General closed the investigations. Therefore, as of the date of this annual report, no current or former member of Ecopetrol's Board of Directors was charged in the first proceeding related to the increase in the Project's budget.

As of the date of this annual report, no charges have been issued in the second proceeding related to the modifications in the Project's schedule.

While the content and status of the proceedings remains confidential, we can report that Reficar and several of its employees have cooperated with and provided the information required by the department of the Office of the Comptroller General in charge of leading the proceedings.

As of the date of this annual report, both Ecopetrol and Reficar have no liability under these proceedings.

- 1.3 From 2017 until 2020 the Office of the Comptroller General has performed special financial audits in Reficar and has delivered final reports, in which it concluded that, in its opinion, Reficar's financial statements from 2016 to 2019 do not reasonably represent the entity's financial position as of the end of each year. This situation originates in the different interpretation, by Reficar and the Comptroller General, of the applicable accounting principles. Historically, Reficar's external independent auditors have issued unqualified opinions on Reficar's financial statements during and after the expansion and modernization project of the refinery. As of the date of this annual report, such auditors have not informed Reficar that there has been any change to their opinions to the financial statements.

As of the date of this annual report, to the best of Ecopetrol's knowledge, the financial statements continue to fairly represent the financial and operational condition of the Company in all material aspects and its internal controls remain effective.

As of the date of this annual report, the current Boards of Directors of Ecopetrol and Reficar are not part of the Comptroller General proceedings.

2. The Attorney General's Office investigations:

Reficar has been officially informed that the Attorney General's Office currently has four ongoing investigations related to the Project.

Regarding one of these four investigations, on September 12, 2017, the Attorney General's Office issued a list of charges against certain former members of Reficar's Board of Directors, as well as certain former officers of Reficar. The charges were related to the failure to fulfill some of their duties as administrators and/or for acting "ultra vires" in the exercise of their functions against: (i) Javier Genaro Gutiérrez (Ecopetrol CEO, 2007-2015); (ii) Felipe Laverde (Reficar General Counsel, 2009-March 2017); (iii) Pedro Rosales (Ecopetrol Downstream Executive Vice President, 2008-2015); (iv) Diana Constanza Calixto (Ecopetrol Head of the Corporate Finance Unit, 2009-2014), (v) Orlando José Cabrales (Reficar CEO, 2009-2012) and (vi) Reyes Reinoso Yanes (Reficar CEO, 2012-2016). The Attorney General's Office closed the case against the rest of the members of Reficar's Board of Directors and the rest of the former officers of Reficar.

On January 17, 2020 the Attorney General's Office issued its judgment against Reyes Reinoso Yanes for acting "ultra vires" in the exercise of his functions promoting a special billing procedure without the due diligence required to protect Reficar's resources. As for the other four individuals initially investigated, they were acquitted of the charges. Mr. Reinoso filed an appeal against the decision and is awaiting resolution.

In another investigation, on October 21, 2020, the Attorney General's Office issued its judgment against a former employee of Reficar, Nicolas Isaksson Palacios, related to the failure to fulfill some of his duties for acting "ultra vires" in the exercise of his functions. The Attorney General's Office closed the case against the rest of the former members of Reficar's Board of Directors and the other Reficar employees.

The specific content and status of the remaining two ongoing investigations remains confidential.

As of the date of this annual report, no member of Ecopetrol's current management team, nor the current Boards of Directors of Ecopetrol or Reficar are part of the Attorney General's Office proceedings.

3. The Prosecutor's Office investigations:

The Prosecutor's Office has been conducting the following legal proceedings in which Ecopetrol has been recognized as a victim:

- 3.1 Between July 25 and August 2, 2017, the Prosecutor's Office indicted the following individuals with charges, the majority of which are related to offenses against the public administration and illegal interest in the execution of agreements: (i) Orlando José Cabrales Martínez (Reficar CEO, 2009-2012); (ii) Reyes Reinoso Yanes (Reficar CEO, 2012-2016); (iii) Felipe Laverde Concha (Reficar General Counsel, 2009-March 2017); (iv) Pedro Alfonso Rosales Navarro (Ecopetrol Downstream Executive Vice President, 2008-2015); (v) Masoud Deidehban (CBI Executive Project Director); (vi) Phillip Asherman (CBI CEO) and (vii) Carlos Lloreda (Reficar's statutory auditor from 2013-2015.) The arraignment hearing began on May 30, 2018 and concluded on August 22, 2019.

The Prosecutor's Office has already made public the factual basis for such charges, which is based on the theory that: (i) executing a cost reimbursable engineering, procurement and construction contract (EPC) and not a lump sum agreement favored CBI interests, and (ii) executing special invoicing procedures (MOA –Memorandum of Agreement and PIP –Project Invoicing Procedure) with CBI allowed the payments of unreasonable amounts not duly verified by the Joint Venture Foster Wheeler USA Corporation and Process Consultant Inc (FPJVC). The defense attorneys have not yet had an opportunity to present their case against such facts in a court of law.

On May 9, 2017, Ecopetrol's Audit and Risk Committee retained a U.S.-based outside law firm to commence a third-party investigation into the matters set forth in the Prosecutor's Office announcement. The results were presented in December 2017 to Ecopetrol's Audit and Risk Committee. This investigation concluded that to date there has been no evidence of possible unlawful acts that affect Ecopetrol's internal control over the financial reporting of the Company, on the allegations made by the Prosecutor's Office.

- 3.2 On October 22 and 23, 2018, the Prosecutor's Office indicted the following individuals with charges related to improper management and obtaining false public documents: Javier Genaro Gutiérrez Pemberthy (Ecopetrol CEO, 2007-2015), Reyes Reinoso Yáñez (Reficar CEO, 2012-2016), Pedro Alfonso Rosales Navarro (Ecopetrol Downstream Executive Vice President, 2008-2015), and Diana Constanza Calixto Hernández (Ecopetrol Head of the Corporate Finance Unit, 2009-2014). The arraignment hearing took place on August 5, 2019.

The Prosecutor's Office made public the factual basis of the charges, which is based on the theory that the indicted directors hid necessary information from Ecopetrol's Board of Directors before the approval of amendment No. 3 of the EPC contract. The defense attorneys have not yet had an opportunity to present their case against such facts in a court of law.

On January 27, 2020, during the indictment hearing, Ecopetrol and Reficar were recognized as victims.

- 3.3 On March 18, 2019, the Prosecutor's Office indicted the following individuals with charges related to entering into agreements without compliance with legal requirements: Orlando José Cabrales Martínez (Reficar CEO, 2009-2012) and Felipe Castilla (Reficar CEO, 2009). The arraignment hearing took place on January 27, 2020.

The Prosecutor's Office has already made public the factual basis of the charges, which is based on the theory that hiring FPJVC as the PMC of the project through a sole source process violated the objective selection principle. The defense attorneys have not yet had an opportunity to present their case against such facts in a court of law.

Ecopetrol and Reficar have cooperated closely and extensively with the control entities in furthering their investigations and will continue to monitor the status and development of these investigations.

As of the date of this annual report, the current Boards of Directors of Ecopetrol and Reficar and the current employees are not part of the above proceedings. None of the legal proceedings described in this paragraph are related with bribery charges.

As of the date of this annual report, Ecopetrol and Reficar have no knowledge of any legal proceeding in the United States regarding the project.

4. Arbitration Tribunal

On March 8, 2016, Reficar filed a Request for Arbitration before the International Chamber of Commerce (the "ICC"), against Chicago Bridge & Iron Company N.V., CB&I (UK) Limited, and CBI Colombiana S.A. (jointly "CB&I") concerning a dispute related to the Engineering, Procurement, and Construction Agreements entered into by and between Reficar and CB&I for the expansion of the Cartagena Refinery in Cartagena, Colombia. Reficar is the Claimant in the ICC arbitration and seeks no less than US\$2 billion in damages plus lost profits.

On May 25, 2016, CB&I filed its Answer to the Request for Arbitration and Counterclaim for approximately US\$106 million and COP\$324,052 million. On June 27, 2016, Reficar filed its reply to CB&I's counterclaim denying and disputing the declarations and relief requested by CB&I. On April 28, 2017, CB&I submitted its Statement of Counterclaim increasing its claims to approximately US\$116 million and COP\$387,558 million. On March 16, 2018, CB&I submitted its Exhaustive Statement of Counterclaim further increasing its claims to approximately US\$129 million and COP\$432,303 million (including in each case interest), and also filed its Exhaustive Statement of Defense to Reficar's claims. On this same date, Reficar filed its Exhaustive Statement of Claim seeking, among others, US\$139 million for provisionally paid invoices under the Memorandum of Agreement ("MOA") and Project Invoicing Procedure ("PIP") Agreements and the EPC Contract.

On June 28, 2019, CB&I submitted its Reply to the Non-Exhaustive Statement of Defence to Counterclaim increasing its claims to approximately US\$137 million and COP\$503,241 million (including in each case interest, respectively). On this same date, Reficar filed its Reply to CB&I's Non-Exhaustive Statement of Defense and its Exhaustive Statement of Defense to CB&I's counterclaim, updating its claim for provisionally paid invoices under the MOA and PIP Agreements and the EPC Contract to approximately US\$137 million.

In January 2020, McDermott International Inc., CB&I's parent company, filed for bankruptcy and announced that it would initiate a reorganization plan pursuant to Chapter 11 of the United States Bankruptcy Law. In response to this situation, Reficar has implemented actions to protect its interests and is advised by a group of experts with whom it will continue to analyze other available measures under these new circumstances.

On January 21, 2020, Comet II B.V., the successor in interest to Chicago Bridge & Iron Company N.V., commenced a bankruptcy case under Chapter 11 of the United States Code in the United States Bankruptcy Court for the Southern District of Texas. Upon the bankruptcy filing, an automatic stay of the commencement or continuation of any action or proceeding, or the enforcement of any judgment or award, against Comet II B.V. became effective, staying the arbitration against Comet II B.V. On January 23, 2020, Comet II B.V. obtained an order from the Bankruptcy Court permitting it to, in its discretion, modify the automatic stay to permit it to proceed with litigation or other contested matters. On March 14, 2020, the Bankruptcy Court entered an order confirming a plan of reorganization, and the order provides for the stay against the arbitration to end upon the earlier of the effective date of the plan and August 30, 2020.

As a consequence of the bankruptcy filing, the arbitration was stayed until July 1, 2020, as described below.

In respect of the arbitration involving Reficar, the confirmation order provides that the proper forum for adjudication of the merits of the arbitration is the International Chamber of Commerce tribunal, the arbitration claims will not be subject to estimation in the Bankruptcy Court, and the stay will not be violated if the parties discuss logistical items with the International Chamber of Commerce tribunal or each other. The order reserves all rights and arguments of the parties related to the arbitration schedule, hearing location, and arbitration logistics and also recognizes that, without waiving any arguments, including but not limited to the Debtors' objections to alternative hearing locations and long gap(s) between hearing dates. On June 30, 2020, McDermott International Inc. notified the relevant parties of the occurrence of the effective date of the plan of reorganization, and thus the stay lifted on the arbitration was lifted on July 1, 2020.

On May 6, 2020, the Superintendence of Corporations ordered the liquidation of CBI Colombiana S.A., a respondent in the arbitration against CB&I. On October 22, 2020, Reficar submitted a proof of claim in the liquidation proceeding to seek recognition as a creditor of CBI Colombiana S.A. for the amounts of its claims in the arbitration. On January 15, 2021, the liquidator of CBI Colombiana S.A. accepted Reficar's petition.

On September 22, 2020, the Tribunal scheduled the commencement of the hearing in May 2021. Until the Tribunal renders its final decision, the outcome of this arbitration is unknown.

Bioenergy Special Audit

The Office of the Comptroller General, in exercise of its fiscal monitoring duties and authority as set forth in Article 267 of the Political Constitution, has undertaken audits of the performance of the Bioenergy S.A.S. and Bioenergy Zona Franca S.A.S. investments.

On February 6, 2017 the Office of the Comptroller General initiated a Special Intervention (Special Audit) in order to evaluate the use of public funds in the project carried out by Bioenergy Zona Franca S.A.S. and Bioenergy S.A.S. On July 10, 2017 the Office of the Comptroller General issued its final report with 15 findings related to: (i) acquisition, lease payments and the use of agricultural lands, (ii) loss of profits due to the project's delay; and (iii) execution of contracts related with the building, commissioning and start-up of the industrial plant and the agricultural component of the project. On December 28, 2018, Bioenergy completed all of the activities set forth in the remediation plan to address the 15 findings.

As a result of some of the findings, the Office of the Comptroller General opened several actions of fiscal liability (*proceso de responsabilidad fiscal*) against former members of Bioenergy's administration and third-party companies.

In 2018, the Office of the Comptroller General initiated a financial audit of Bioenergy's financial statements for the year ended December 31, 2018. On May 21, 2019, the Comptroller General delivered its financial audit final report, issuing: (i) an unqualified opinion on Bioenergy's financial statements, (ii) an efficient and effective internal control process opinion, and (iii) a reasonable opinion, since the budget was prepared and executed, in all relevant matters, according to Bioenergy's budgeting internal regulation. Finally, the Office of the Comptroller General determined three findings related to: (i) plots of land pending to legalize, (ii) ethanol imports and (iii) the leasing agreement of the Casa Roja plot of Land. On December 31, 2020, Bioenergy completed all of the activities set forth in the remediation plan to address the three findings.

In 2019, the Office of the Comptroller General initiated and ended a compliance audit of Bioenergy S.A.S for the period starting July 1, 2017 to May 31, 2019. The Comptroller General notified Bioenergy on February 4, 2020 its compliance audit final report determining seven findings related to: (i) agricultural lands productivity, (ii) incomes and expenses from rental payments of subleased agricultural lands, (iii) Balanced scorecard results for 2017-2018, (iv) update of laboratory procedures, (v) transport contract number 0029-17 settlement, (vi) document handling and (vii) Campo Victoria plot of Land. Bioenergy filed the remediation plan on February 25, 2020.

Until June 24, 2020, when the Superintendence of Companies of Colombia gave the order to start the Bioenergy's liquidation process, Bioenergy S.A.S. completed activities as scheduled in the remediation plan according to the June 30, 2020 deadline. Any pending activities related to the aforementioned remediation plan, are in charge of the liquidator appointed by the Superintendence of Companies of Colombia in Bioenergy's liquidation process.

6. Shareholder Information

6.1 Shareholders' General Assembly

Our Shareholders' General Assembly was held on March 26, 2021 and the following matters were approved:

- The plan for distribution of the Company's profits, which establishes the distribution of an ordinary dividend per share of seventeen Colombian pesos (COP\$ 17), is as follows: a payment of 100% of the dividend to minority shareholders and the majority shareholder, to be made on April 22, 2021.
- The occasional reserve of COP\$ 5.4 trillion in order to support the financial sustainability and flexibility of the Company in the development of its strategy.
- Amendment of our bylaws. For further information please see the section Corporate Governance—Bylaws.

6.2 Dividend Policy

In 2018, the Board of Directors approved a dividend policy consisting of the ordinary distribution of between 40% and 60% of the adjusted net income of the Company of each fiscal year. For this purpose, the Board of Directors shall assess overall delivery against the Company's financial targets, as well as the macroeconomic environment, projected cash requirements for delivering on our Business Plan and strategy, while maintaining appropriate financial flexibility in keeping the Company's debt metrics in line with an investment grade rating. The policy does not preclude the distribution of extraordinary dividends above the 40% to 60% range, under exceptional circumstances and with due consideration of the above criteria. The maximum amount to be distributed is the profits available to shareholders (net income after release and appropriation for legal, fiscal and occasional reserves).

Pursuant to Colombian law, dividend distribution to our shareholders must be approved by a 78% majority of the shares represented in the corresponding General Shareholders Assembly. In the absence of this special majority, at least 50% of the net profits must be distributed.

On March 26, 2021, our shareholders at the ordinary General Shareholders' Assembly approved an ordinary dividend of 41.41% of our net income for the fiscal year ended December 31, 2020 amounting to COP\$698,984 million, or COP\$17 per share, based on the number of outstanding shares as of December 31, 2020. The payment date will be April 22, 2021 for 100% of our shareholders.

On March 27, 2020, our shareholders at the ordinary General Shareholders' Assembly approved an ordinary dividend of 56% of our net income for the fiscal year ended December 31, 2019. At the Extraordinary General Shareholders' Meeting held on December 16, 2019, the Company's Shareholders approved the following: i) the change in the destination of the Company's occasional reserve that had been constituted in the General Shareholders' Meeting held on March 29, 2019 and ii) its subsequent distribution as an extraordinary dividend of 89 Colombian pesos (COP\$89) per share.

On March 29, 2019, our shareholders at the ordinary General Shareholders Assembly approved an ordinary dividend of 60% of our net income or COP\$169 per share (within the dividend policy of 40% and 60% of net income), for the fiscal year ended December 31, 2018 and an extraordinary dividend of 20% of our net income or COP\$56 per share, given our strong operational and robust cash position in 2018, for a total dividend per share of COP\$225. On March 23, 2018, our shareholders at the ordinary General Shareholders Assembly approved an ordinary dividend of 55% of our net income for the fiscal year ended December 31, 2017. On March 31, 2017, our shareholders at the ordinary General Shareholders Assembly approved an ordinary dividend of 40% of our net income before the impairment of non-current assets (net of taxes) for the fiscal year ended December 31, 2016. See section *Financial Review—Liquidity and Capital Resources—Dividends*.

Ecopetrol S.A. is required to have legal reserves equal to 50% of its subscribed capital. If the legal reserves are less than 50% of subscribed capital, we will contribute 10% of net income to our legal reserves every year until our legal reserves meet the required level.

6.3 *Market and Market Prices*

Registration and Transfer of Shares

Under Colombian law, transfers of shares must be registered on the issuer's stock ledger. Only those holders registered on the stock ledger are considered by law as shareholders. Ecopetrol's shares are in electronic form, other than those shares held by the Nation, which are in physical form.

Transfers of electronic shares is required to be negotiated through the Colombian Stock Exchange. In Colombia, only the relevant stockbrokers called *Sociedades Comisionistas de Bolsa* are authorized to make the transfer of shares through the Colombian Stock Exchange. The transfer of shares is registered in the Centralized Security Deposit (*Depósito Centralizado de Valores*) or DECEVAL, through the relevant stockbrokers. DECEVAL records the share transfer on its systems, in order to make the corresponding registration in the issuer stock ledger.

Under Colombian legislation, if a transfer of shares has a value equivalent to or higher than 66,000 UVR (the UVR was COP\$ 275.0626 as of December 31, 2020) it must be made through the BVC if the shares are registered with the BVC. Otherwise, shareholders can freely negotiate a transfer of shares.

Nevertheless, pursuant to Decree 2555 of 2010 Article 6.15.1.1.2 the following transfers are not required to be performed through the BVC:

- Transfers between shareholders who are considered to be the same beneficial owner;
- Transfer of shares owned by financial institutions, under supervision of the Superintendence of Finance, that are in a liquidation process;
- Repurchases of shares by the issuer;
- Property delivered in lieu of payment, or payment of money or other valuable property, different than the amount owed or demanded, in exchange for the payment of the debt;
- Transfer of shares made by the Nation or the Financial Institutions Warranty Fund (*Fondo de Garantías de Instituciones Financieras*) or FOGAFIN;
- Transfer of shares issued abroad by Colombian companies, provided they take place outside Colombia;
- Transfer of shares issued by foreign companies, offered through a public offering in Colombia, provided that they take place outside Colombia;
- Transfers made by the Central Counterparty Risk Chamber, in accordance with the provisions of paragraph 2 of Article 2.13.1.1.1. of this decree; and
- Any other transaction specifically authorized by the Superintendence of Finance to take place outside the BVC.

For the purposes described above, multiple transfer transactions made within one hundred twenty (120) calendar days, between the same parties on shares of the same issuer and under similar conditions, are considered a single transfer.

6.4 Description of Ecopetrol Registered Debt Securities

Ecopetrol has issued the following classes of registered notes under an indenture (the Indenture), dated as of July 23, 2009, and amended as of June 26, 2015, between the Company and the Bank of New York Mellon, as trustee:

5.875% Notes due 2023
4.125% Notes due 2025
5.375% Notes due 2026
6.875% Notes due 2030
7.375% Notes due 2043
5.875% Notes due 2045

Please refer to Exhibits 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, and 4.20 to this annual report for the information relating to these debt securities required by Item 12.A of Form 20-F.

6.5 Description of Ecopetrol ADRs

Fees and Charges That a Holder of Our ADSs May Have to Pay, Either Directly or Indirectly

JPMorgan Chase Bank, N.A., our Depositary, may charge each person to whom ADSs are issued, including, without limitation, issuances against deposits of shares, issuances in respect of share distributions, rights and other distributions, issuances pursuant to a stock dividend or stock split declared by us or issuances pursuant to a merger, exchange of securities or any other transaction or event affecting the ADSs or Deposited Securities, and each person surrendering ADSs for withdrawal of Deposited Securities in any manner permitted by the Deposit Agreement or whose ADSs are cancelled or reduced for any other reason, US\$5.00 for each 100 ADS (or any portion thereof) issued, delivered, reduced, cancelled or surrendered, as the case may be. The Depositary may sell (by public or private sale) sufficient securities and property received in respect of a share distribution, rights and/or other distribution prior to such deposit to pay such charge.

The Depositary collects its fees for issuance and cancellation of ADSs directly from investors depositing common shares or surrendering ADSs for the purpose of withdrawal or from intermediaries acting for them. The Depositary collects fees for making distributions to investors by deducting those fees from the amounts distributed or by selling a portion of distributable property to pay the fees. The Depositary may collect its annual fee for Depositary services by deduction from cash distributions, or by directly billing investors, or by charging the book-entry system accounts of participants acting for them. The Depositary may generally refuse to provide services to any holder until the fees and expenses owing by such holder for those services or otherwise are paid.

The following additional charges may be incurred by holders of ADRs, by any party depositing or withdrawing common shares or by any party surrendering ADSs and/or to whom ADSs are issued (including, without limitation, issuance pursuant to a stock dividend or stock split declared by us or an exchange of stock regarding the ADRs or the Deposited Securities or a distribution of ADSs), whichever is applicable:

- A fee of US\$0.05 or less per ADS for any cash distribution made pursuant to the Deposit Agreement;
- A fee for the distribution of securities (or the sale of securities in connection with a distribution), such fee being in an amount equal to the fee for the execution and delivery of ADSs which would have been charged as a result of the deposit of such securities (treating all such securities as if they were common shares) but which securities or the net cash proceeds from the sale thereof are instead distributed by the Depositary to those holders of ADRs entitled thereto;
- An aggregate fee of up to US\$0.05 per ADS per calendar year (or portion thereof) for services performed by the Depositary in administering the ADRs (which fee may be charged on a periodic basis during each calendar year and shall be assessed against holders of ADRs as of the record date or record dates set by the Depositary during each calendar year and shall be payable in the manner described in the next succeeding provision);

- A fee for the reimbursement of such fees, charges and expenses as are incurred by the Depositary and/or any of the Depositary's agents (including, without limitation, the custodian and expenses incurred on behalf of holders of ADRs in connection with compliance with foreign exchange control regulations or any law or regulation relating to foreign investment) in connection with the servicing of our common shares or other Deposited Securities, the sale of securities (including, without limitation, Deposited Securities) and the delivery of Deposited Securities or otherwise in connection with the Depositary's or its custodian's compliance with applicable law, rule or regulation (which fees and charges shall be assessed on a proportionate basis against registered holders of ADRs as of the record date or dates set by the Depositary and shall be payable at the sole discretion of the Depositary by billing such holders of ADRs or by deducting such charge from one or more cash dividends or other cash distributions);
- Stock transfer or other taxes and other governmental charges;
- SWIFT, cable, telex and facsimile transmission and delivery charges incurred at the request of a holder of ADRs;
- Transfer or registration fees for the registration of transfer of Deposited Securities on any applicable register in connection with the deposit or withdrawal of Deposited Securities; and
- In connection with the conversion of foreign currency into U.S. dollars, the Depositary shall deduct out of such foreign currency the fees, expenses and other charges charged by it or the Depositary's agent (which may be a division, branch or affiliate) so appointed in connection with such conversion. The Depositary and/or the Depositary's agent may act as principal for such conversion of foreign currency. Such charges may at any time and from time to time be changed by agreement between us and the Depositary.

We will pay all other charges and expenses of the Depositary and any agent of the Depositary (except the custodian) pursuant to agreements from time to time between us and the Depositary. The fees described above may be amended from time to time.

Fees and Other Direct and Indirect Payments Made by the Depositary to Us

Our Depositary has agreed to reimburse us for certain expenses we incur that are related to establishment and maintenance of the ADR program, including investor relations expenses and exchange application and listing fees. In 2018, reimbursements were made in the amount of approximately US\$2,062,050 for expenses related to investor relations activities. In 2019, reimbursements were made in the amount of approximately US\$2,458,847. In 2020, reimbursements were made in the amount of approximately US\$ 2,020,472.

Other

Please refer to Exhibit 2.1 to this annual report for the remaining information relating to our American Depositary Shares required by Item 12.D of Form 20-F.

6.6 Taxation

6.6.1 Colombian Tax Considerations

The following is a general description of the Colombian tax considerations for investments in common shares in Colombia or for the purchase of ADSs, in a foreign securities market. This description is based on applicable law in effect as of the date of this annual report is issued, which may be subject to changes.

Prospective purchasers of common shares or ADSs should consult their own tax advisors for a detailed analysis of the tax consequences in Colombia, resulting from the acquisition, ownership and disposition of common shares or ADSs.

General Rules

Colombian entities and individuals who are deemed to be residents within the Colombian national territory for Colombian tax purposes are subject to Colombian income tax on their worldwide income. Foreign entities and individuals who are not deemed to be residents in Colombia, are subject to income tax in Colombia only with respect to their Colombian-source income, which is generally defined as income obtained from (i) the rendering of services inside Colombian territory, (ii) the exploitation of tangible and intangible assets in Colombia, and (iii) the sale of tangible or intangible assets that are located inside Colombian territory at the time of the sale among others. Double taxation treaties signed by Colombia, if applicable, may provide for special regulations regarding income taxation. Until 2018, foreign residents deriving income through a permanent establishment were subject to Colombian income tax on the Colombian source income attributable to their permanent establishment only. As of 2019, foreign tax residents deriving income through a permanent establishment will be subject to Colombian income tax on their global source income attributable to their permanent establishment in Colombia.

Dividends paid by Colombian companies, as well as profits distributed by branches/permanent establishments of foreign entities, are deemed as a dividend and as Colombian income. However, the applicable tax depends on an imputation system set forth in Articles 48 and 49 of the Colombian Tax Code (hereinafter “CTC”). For more information related to the Colombian dividends tax regime, see [Risk Review—Risk Factors—Risks Related to Colombia’s Political and Regional Information](#).

As mentioned above, Law 1819 of 2016 created a new dividends tax that applies on all dividend distributions to Colombian individuals or to any type of non-resident shareholder, absent any specific treaty or exception, regardless that dividends are paid from taxed or non-taxed profits. According to the aforementioned law, dividend payments made to foreign shareholders out of profits accrued at the corporate level as of 2017 were subject to a 5% withholding. That rate was subsequently modified by Law 1943 of 2018, which increased it to 7.5% and extended dividend taxation to intercompany dividends between Colombian resident companies (with certain exceptions).

From fiscal year 2019 onwards, a withholding tax on dividends paid applies as follows:

- i. For resident companies and non-resident shareholders (companies and individuals): (i) a 10% dividend (7.5% for fiscal year 2019) tax on dividends distributed from profits taxed at the corporate level (except that dividends paid to non-resident shareholders out of profits taxed at the corporate level prior to and including December 31, 2016, are not subject to this tax); and (ii) 32% (33% for fiscal year 2019) withholding tax rate on dividends distributed from profits not taxed at the corporate level (31% for 2021 and 30% as of 2022), plus an additional 10% (7.5% for fiscal year 2019) dividend tax after applying the initial 32% withholding tax rate (i.e., 38.8% in 2020 = $\$100 * 32\% = \32 , plus $\$68 * 10\% = \6.8).
- ii. For Colombian individuals: dividend income in excess of 300 UVT are taxed at a 15% and 10% rate, for fiscal years 2019 and 2020 (2021 onwards), respectively.

Relief or reduced tax rates may apply under an applicable treaty to avoid double taxation, but the application of any such rules must be analyzed on a case-by-case basis.

For Colombian tax purposes, an individual is considered to be a Colombian resident when he/she meets any of the following criteria:

- i. He/she remains in Colombia continuously or discontinuously for more than 183 calendar days within any given 365-consecutive-day term;
- ii. He/she is related to the Colombian government’s foreign service or to individuals who are in the Colombian government’s foreign service and who, by virtue of the Vienna Conventions on diplomatic and consular relations, are exempted from taxes during the time of their service; or

iii. He/she is a Colombian national and:

- Has a spouse or permanent companion, or dependent children, who are tax residents in Colombia, or
- 50% or more of his or her total income is Colombian source income, or
- 50% or more of his or her assets are managed in Colombia, or
- 50% or more of his or her assets are deemed to be located or possessed in Colombia, or
- Has failed to provide proof of residency in another country (different from Colombia) upon previous official request by the Colombian tax office, or
- He/she has a tax residency in a country considered by the Colombian government to be a low tax jurisdiction or a tax haven.

Law 1739 of 2014 clarifies that Colombian nationals who meet any of the following requirements will not be deemed as tax residents:

- i. If more than 50% of his or her annual income has its source in the jurisdiction where he or she is domiciled and whose country of domicile is not Colombia.
- ii. If more than 50% of his/her assets are located in the jurisdiction where he or she is domiciled and whose country of domicile is not Colombia.

For purposes of Colombian taxation, an entity is deemed to be a “national” or a “Colombian entity” and, therefore, subject to taxation in Colombia on its worldwide income, if it meets any of the following criteria:

- i. It has its place of effective management, in Colombia during the corresponding year or taxable period;
- ii. It has its main domicile in the Colombian territory; or
- iii. It has been incorporated in Colombia, in accordance with Colombian laws.

Pursuant to the Colombian Tax Code, a foreign company or non-resident individual has a permanent establishment in Colombia when said company or individual performs activities in Colombia through: (i) a fixed place of business (*i.e.*, branches, factories or offices), or (ii) an individual who is not an independent agent empowered to execute agreements on behalf of the foreign company. As noted above, until 2018 permanent establishments were considered Colombian taxpayers in connection with their Colombian source income. As of fiscal year 2019, foreign residents deriving income through a Colombian permanent establishment are subject to Colombian income tax on the worldwide income attributable to the Colombian permanent establishment. A foreign company or entity will not be deemed to have a permanent establishment by the sole fact that it acts through a broker or any other independent agent. In addition, passive-income generating activities, such as dividends, royalties and interests, typically do not qualify as entrepreneurial and are not deemed to create permanent establishments.

Tax Treatment of a Non-Colombian Entity and a Non-Resident Individual of Colombia Who Purchases an ADS in a Foreign Securities Market

Dividends

As a general rule, dividends paid to foreign companies, foreign entities or non-resident individuals who are investing in ADSs which underlying assets are Colombian shares are treated as Colombian-source income and are thus subject to Colombian income tax.

To avoid double taxation, dividends paid by Colombian entities are not subject to income tax at the shareholder level when they are paid out of corporate profits that have been previously taxed at the corporate level. For fiscal years 2017 and 2018, a withholding tax on dividends was triggered for dividends paid to non-resident shareholders. Withholding tax rates on dividends were as follows: (i) a 5% dividend tax for dividends distributed out of profits already taxed at the company's level; (ii) 35% withholding tax rate for dividends distributed out of profits that were not taxed at the company's level, plus a 5% dividend tax rate after having applied and deducted the initial 35% withholding. Note that dividends paid to non-resident shareholders out of profits taxed at the corporate level until December 31, 2016, are not subject to the aforementioned 5% dividend tax or any other income tax. As of 2019, the withholding tax rates applicable to dividends paid to resident companies and non-resident shareholders (companies and individuals) are: (i) a 7.5% dividend tax on dividends distributed from profits taxed at the corporate level (except that dividends paid to non-resident shareholders out of profits taxed at the corporate level prior to and including December 31, 2016, are not subject to this tax); and (ii) 33% withholding tax rate on dividends distributed from profits not taxed at the corporate level (32% for 2020, 31% for 2021 and 30% as of 2022), plus an additional 7.5% (10% from 2020 onward) dividend tax after applying the initial 33% (32%, 31% or 30%) withholding tax rate.

Furthermore to the above, non-resident entities or non-resident individuals whose investment qualifies as portfolio investments (*i.e.*, investing through a Foreign Funds Administration Account - FFAA) will be taxed upon distribution by means of a withholding tax mechanism. In this case, pursuant to Article 18-1 of the Colombian Tax Code, the applicable withholding tax rate on taxable dividends is 25%, assuming that the dividends cannot be attributed to a permanent establishment in Colombia belonging to the shareholder and were not subject to taxation at the corporate level. The abovementioned 5% dividend tax (7.5% in 2019 and 10% from 2020 onwards) applies on the balance of dividends to be distributed to the shareholder investing through an FFAA, or on the gross amount in such cases the dividend is paid out of profits that were subject to taxation at the corporate level. These foreign shareholders subject to this withholding tax are not required to file an income tax return in Colombia.

Taxation of Capital Gains from the Sale of ADSs

Capital gains obtained from the sale of ADSs by non-Colombian entities, Colombian individuals who are non-residents in Colombia and foreign non-resident individuals, are not subject to income tax in Colombia, as such sale does not generate Colombian-source income to the extent that the ADSs are not deemed to be sourced in Colombia. If the holder of the ADSs who is a non-resident entity, a Colombian individual who is not a resident in Colombia or a foreign non-resident individual, decides to surrender the ADSs and withdraw the underlying common shares, it is arguable that such transaction does not generate a capital gain subject to income tax in Colombia. However, different interpretations may be adopted by the Colombian Tax Authorities on this matter.

Tax Treatment in Colombia of a Non-Colombian Entity and a Non-Resident Individual of Colombia Who Purchases Ecopetrol's Shares in Colombia's Securities Market

Dividends

As a general rule, dividends paid to foreign companies, foreign entities, or to non-resident individuals in Colombia, who are investing in Colombian shares directly or through a FFAA, are treated as national-source income; thus, they are subject to Colombian income tax.

The dividend tax regime as of 2020 was modified as follows:

- i. Dividends paid to non-resident shareholders: (i) a 10% dividend tax on dividends distributed from profits taxed at the corporate level (except that dividends paid to non-resident shareholders out of profits taxed at the corporate level prior to and including December 31, 2016, are not subject to this tax); or (ii) 32% withholding tax rate on dividends distributed from profits not taxed at the corporate level (31% for 2021 and 30% as of 2022), plus an additional 10% dividend tax after applying the initial 32% withholding tax rate (*i.e.*, 38.8% in 2020).
- ii. Dividends paid to Colombian companies: (i) a 7.5% dividend tax on dividends distributed from taxed profits, or (ii) a 32% withholding tax on dividends distributed from non-taxed profits (31% on 2021 and 30% as from 2022), plus an additional 7.5% dividend tax on the balance of the dividend amount after the initial 32% withholding.
- iii. For Colombian resident individuals: dividend income in excess of 300 UVT is taxed at a rate of 10%.

Non-resident entities or non-resident individuals whose investment qualifies as portfolio investment (*i.e.*, investing through a FFAA), will be taxed upon distribution by means of the withholding tax mechanism. In this case withholding will apply at 25% on dividends that are distributed by the Colombian entity are not taxed at the corporate level. Pursuant to Article 18-1 of the Colombian Tax Code, assuming that the dividends cannot be attributed to a permanent establishment in Colombia belonging to the shareholder. These foreign shareholders subject to this withholding tax are not required to file an income tax return in Colombia, nevertheless those rules would not apply to foreign investments whereby the final beneficiary is a tax resident in Colombia who has control over such investments. This treatment was modified by Law 1943/2018 and Law 2010/2019. See section *Financial Review—Effect of Taxes, Exchange Rate*.

Variation, Inflation and the Price of Oil on our Results—Taxes—Taxes.

In addition to the above, the new dividend tax will apply at a 5% rate over dividends distributed from profits taxed at the corporate level. This treatment was modified by Law 1943 of 2018 and Law 2010 of 2019 (7.5% in 2019 and 10% from 2020 onwards). See section *Financial Review—Effect of Taxes, Exchange Rate Variation, Inflation and the Price of Oil on our Results—Taxes—Taxes.*

Taxation of Capital Gains for the Sale of Shares

Pursuant to Article 36-1 of the Colombian Tax Code, capital gains derived from the sale of shares listed on the BVC and owned by the same beneficial owner, are deemed as non-taxable income in Colombia, provided that the shares sold during the same taxable year do not represent more than 10% of the outstanding shares of the listed company. Pursuant to Section 1.6.1.13.2.19 of Regulatory Decree 1625 of 2016, sellers of shares are not required to file an income tax return for the transfer of securities that are listed in the National Registry of Securities and Issuers (*Registro Nacional de Valores y Emisores*) as long as the foreign investment is treated as a portfolio investment according to Article 3 of Decree 2080 of 2000 (currently compiled in Article 2.17.2.2.1.2 of Decree 1068 of 2015) and the abovementioned 10% threshold is not surpassed.

If the abovementioned requirements are not met, the capital gain obtained in the sale of shares is subject to income tax or capital gains tax, under the following rules:

- (i) The gain or loss arising therefrom will be the difference between the sale price and the tax basis of the shares. As a general rule, the tax basis of shares is equal to the price paid for such shares (i.e., cost of acquisition).
- (ii) The applicable tax rate and the withholding tax rate have to be determined on a case-by-case basis. Generally, if the shares have been owned for at least two years and qualify as fixed assets (i.e., they are not sold within their ordinary course of business), the profits from the sale will qualify as capital gains taxable at 10%; otherwise, profits will qualify as ordinary income, subject to a 33% income tax for fiscal years 2018 and 2019 (2020 – 32%; 2021 – 31%; 2022 onwards – 30%).

Tax Treatment of Non-Residents Who Purchase Ecopetrol's Shares in the BVC Market and Exchange Them for ADSs

Dividends

Payment of dividends by Colombian entities to foreign companies, foreign entities or to non-resident individuals who are investing in ADSs which underlying assets are Colombian shares or in Colombian shares directly are subject to the tax treatment described above.

Taxation on Capital Gains for the Sale of Shares

If the holder of the Colombian shares is a non-resident entity, a Colombian individual who is not a resident in Colombia or a foreign non-resident individual, and such holder decides to exchange such common shares for ADSs, it is arguable that such transaction should not generate a capital gain subject to income tax in Colombia. However, different interpretations may be adopted by the Colombian tax authorities on this matter. For instance, assuming that the exchange of securities is treated as a sale of Ecopetrol's shares, the seller would be subject to the tax treatment described above in connection with the taxation of capital gains for the sale of shares. Absent any specific rules or regulations addressing this specific situation, a case-by-case analysis would be necessary.

6.6.2 U.S. Federal Income Tax Consequences

This summary describes the principal U.S. federal income tax consequences of the ownership and disposition of common shares or ADSs, but it does not purport to be a comprehensive description of all of the U.S. tax consequences that may be relevant to a decision to hold or dispose of common shares or ADSs. This summary applies only to purchasers of common shares or ADSs who will hold the common shares or ADSs as capital assets for U.S. federal income tax purposes and does not apply to special classes of holders such as dealers in securities or currencies, holders whose functional currency is not the U.S. dollar, holders of 10% or more of our shares (taking into account shares held directly or through depositary arrangements) by vote or by value, tax-exempt organizations, financial institutions, holders liable for the alternative minimum tax, securities traders who elect to account for their investment in common shares or ADSs on a mark-to-market basis, partnerships or other pass-through entities or arrangements and investors therein, insurance companies, U.S. expatriates, persons that purchase or sell common shares or ADSs as part of a wash sale for tax purposes, and persons holding common shares or ADSs in a hedging transaction or as part of a straddle, conversion or other integrated transaction for U.S. federal income tax purposes. The statements regarding U.S. tax law set forth in this summary are based on the Internal Revenue Code of 1986, as amended, the “Code,” its legislative history, existing and proposed U.S. Treasury regulations, published rulings and court decisions, all as in force on the date of this annual report, and changes to such law subsequent to the date of this annual report may affect the tax consequences described herein (possibly with retroactive effect). This summary is also based in part on the representations of the Depositary and the assumption that each obligation in the Deposit Agreement and any related agreement will be performed in accordance with its terms.

Each holder is encouraged to consult such holder’s tax advisor concerning the overall tax consequences to it, including the consequences under laws other than U.S. federal income tax laws, of an investment in common shares or ADSs. In this discussion, references to a “U.S. Holder” are to a beneficial owner of a common share or an ADS that is for U.S. federal income tax purposes (1) an individual citizen or resident of the United States, (2) a corporation, or any other entity taxable as a corporation, organized under the laws of the United States, any state thereof or the District of Columbia, (3) an estate whose income is subject to U.S. federal income tax regardless of its source, or (4) a trust if (i) a United States court can exercise primary supervision over the trust’s administration and one or more United States persons are authorized to control all substantial decisions of the trust or (ii) it has in effect a valid election under applicable U.S. Treasury regulations to be treated as a U.S. person.

For U.S. federal income tax purposes, holders of ADSs generally will be treated as owners of the common shares represented by such ADSs.

This discussion does not address any aspect of U.S. federal taxation other than U.S. federal income taxation (such as the estate and gift tax or the Medicare tax on net investment income). Holders of common shares or ADSs should consult their own tax advisor regarding the U.S. federal, state and local and other tax consequences of owning and disposing of common shares and ADSs in their particular circumstances.

Distributions on Common Shares or ADSs

A distribution to U.S. Holders made by us of cash or property with respect to common shares or ADSs generally will be treated as a dividend for U.S. federal income tax purposes to the extent paid out of our current or accumulated earnings and profits (as determined under U.S. federal income tax principles). Distributions in excess of our current or accumulated earnings and profits, as determined for U.S. federal income tax purposes, will be treated first as a tax-free return of capital reducing such U.S. Holder’s adjusted tax basis in the common shares or ADSs. Any distribution in excess of such adjusted tax basis will be treated as capital gain and will be either long-term or short-term capital gain depending upon whether the U.S. Holder held the common shares or ADSs for more than one year. Distributions of additional common shares or ADSs to U.S. Holders that are part of a pro rata distribution to all of our shareholders generally will not be subject to U.S. federal income tax. We do not maintain calculations of our earnings and profits under U.S. federal income tax principles, and, therefore, except as described in the previous sentence, U.S. Holders should expect that any distributions generally will be reported as dividends for U.S. federal income tax purposes. As used below, the term “dividend” means a distribution that constitutes a dividend for U.S. federal income tax purposes. The amount of any distribution will include the amount of any Colombian tax withheld on the amount distributed, and the amount of a distribution paid in Colombian Pesos will be measured by reference to the exchange rate for converting Colombian Pesos into U.S. dollars in effect on the date the distribution is received by the Depositary (or by a U.S. Holder in the case of a holder of common shares) regardless of whether the payment is in fact converted into U.S. dollars. If the Depositary (or U.S. Holder in the case of a holder of common shares) does not convert such Colombian Pesos into U.S. dollars on the date it receives them, generally, any gain or loss resulting from currency exchange fluctuations during the period from the date the dividend payment is included in income to the date the payment is converted into U.S. dollars will be treated as ordinary income or loss and will not be eligible for the special tax rate applicable to qualified dividend income (as discussed below). The gain or loss generally will be income or loss from sources within the United States for foreign tax credit limitation purposes. Dividends paid by us will not be eligible for the dividends received deduction allowed to corporations under the Code.

If you are a non-corporate U.S. Holder, dividends that constitute qualified dividend income will be taxable to you at the preferential rates applicable to long-term capital gains, provided that you meet certain holding requirements. Dividends paid on the ADSs will be treated as qualified dividend income if (1) the ADSs are readily tradable on an established securities market in the United States and (2) we were not, in the year prior to the year in which the dividend was paid, and are not, in the year in which the dividend is paid, a passive foreign investment company (PFIC). The ADSs are listed on the New York Stock Exchange, and will qualify as readily tradable on an established securities market in the United States, as long as they are so listed. Based on our audited financial statements and relevant market and shareholder data, we believe that we were not treated as a PFIC for U.S. federal income tax purposes with respect to our 2020 taxable year. In addition, based on our audited financial statements and our current expectations regarding the value and nature of our assets, the sources and nature of our income, and relevant market and shareholder data, we do not anticipate becoming a PFIC for the 2021 taxable year. However, this conclusion is a factual determination that is made annually and thus may be subject to change. Based on existing guidance, it is not clear whether dividends received with respect to the common shares will be treated as qualified dividends. In addition, the U.S. Treasury has announced its intention to promulgate rules pursuant to which holders of ADSs or common shares and intermediaries through whom such securities are held will be permitted to rely on certifications from issuers to treat dividends as qualified for tax reporting purposes. Because such procedures have not yet been issued, it is not clear whether we will be able to comply with them. Holders of ADSs and common shares should consult their own tax advisers regarding the availability of the reduced dividend tax rate in the light of the considerations discussed above and their own particular circumstances.

A U.S. Holder will be entitled, subject to a number of complex limitations and conditions, to claim a U.S. foreign tax credit in respect of any Colombian income taxes withheld on dividends received on common shares or ADSs. U.S. Holders who do not elect to claim a credit for any foreign income taxes paid during the taxable year may instead claim a deduction in respect of such Colombian income taxes, provided the U.S. Holder elects to deduct (rather than credit) all foreign income taxes for that year. Dividends received with respect to the common shares or ADSs will be treated as foreign source income, subject to various classifications and other limitations. For the purposes of the U.S. foreign tax credit limitations, the dividends paid with respect to our common shares or ADSs generally will constitute “passive category income” for most U.S. Holders. The rules relating to computing foreign tax credits or deducting foreign income taxes are extremely complex, and U.S. Holders are urged to consult their own independent tax advisers regarding the availability of foreign tax credits with respect to any Colombian income taxes withheld.

Sale, Exchange or Other Taxable Dispositions of Common Shares or ADSs

A U.S. Holder generally will recognize capital gain or loss upon the sale, exchange or other taxable disposition of common shares or ADSs in an amount equal to the difference between the U.S. dollar value of the amount realized on the sale, exchange or other taxable disposition of the common shares or ADSs and the U.S. Holder’s adjusted tax basis, determined in U.S. dollars, in the common shares or ADSs. Any gain or loss will be long-term capital gain or loss if the common shares or ADSs have been held for more than one year. Certain non-corporate U.S. Holders (including individuals) may be eligible for preferential rates of U.S. federal income tax in respect of long-term capital gains. The deductibility of capital losses is subject to limitations under the Code.

If you are a U.S. Holder of common shares or ADSs, the initial tax basis of your common shares or ADSs will be the U.S. dollar value of the Colombian Peso-denominated purchase price determined on the date of purchase. If the common shares or ADSs are treated as traded on an “established securities market,” a cash basis U.S. Holder, or, if it elects, an accrual basis U.S. Holder, will determine the dollar value of the cost of such common shares or ADSs by translating the amount paid at the spot rate of exchange on the settlement date of the purchase. Such an election by an accrual basis U.S. Holder must be applied consistently from year to year and cannot be revoked without the consent of the Internal Revenue Service (IRS). If you convert U.S. dollars to Colombian Pesos and immediately use that currency to purchase common shares or ADSs, such conversion generally will not result in taxable gain or loss to you. With respect to the sale or exchange of common shares or ADSs, the amount realized generally will be the U.S. dollar value of the payment received determined on (1) the date of receipt of payment in the case of a cash basis U.S. Holder and (2) the date of disposition in the case of an accrual basis U.S. Holder. If the common shares or ADSs are treated as traded on an “established securities market,” a cash basis taxpayer, or, if it elects, an accrual basis taxpayer, will determine the U.S. dollar value of the amount realized by translating the amount received at the spot rate of exchange on the settlement date of the sale.

Deposits and withdrawals of common shares in exchange for ADSs, and of ADSs for common shares, generally will not result in the realization of gain or loss for U.S. federal income tax purposes.

Backup Withholding and Information Reporting

In general, dividends on common shares or ADSs, and payments of the proceeds of a sale, exchange or other taxable disposition of common shares or ADSs, paid within the United States, by a U.S. payer through certain U.S.-related financial intermediaries to a U.S. Holder are subject to information reporting and may be subject to backup withholding at a current rate of 24%, unless the holder (1) establishes that it is a corporation or other exempt recipient or (2) with respect to backup withholding, provides an accurate taxpayer identification number and certifies that it is a U.S. person and that no loss of exemption from backup withholding has occurred.

Backup withholding is not an additional tax. The amount of any backup withholding tax from a payment to a U.S. Holder will be allowed as a credit against the U.S. Holder's U.S. federal income tax liability, provided that the required information is timely furnished to the IRS. U.S. Holder generally may obtain a refund of any amounts withheld under the backup withholding rules that exceed its U.S. federal income tax liability by timely filing a refund claim with the IRS.

U.S. Tax Considerations for Non-U.S. Holders

A holder or beneficial owner of common shares or ADSs that is not a U.S. Holder for U.S. federal income tax purposes (a "non-U.S. Holder") generally will not be subject to U.S. federal income or withholding tax on dividends received on common shares or ADSs, unless the dividends are "effectively connected" with the non-U.S. Holder's conduct of a trade or business within the United States. In such a case, a non-U.S. Holder generally will be taxed in the same manner as a U.S. Holder. In the case of "effectively connected" dividends received by a corporate non-U.S. Holder, the corporate non-U.S. Holder may, under certain circumstances, be subject to an additional "branch profits tax" at a 30% rate.

A non-U.S. Holder of common shares or ADSs will not be subject to U.S. federal income or withholding tax on gain realized on the sale of common shares or ADSs, unless (i) the gain is "effectively connected" with the non-U.S. Holder's conduct of a trade or business in the United States or (ii) in the case of gain realized by an individual non-U.S. Holder, the non-U.S. Holder is present in the United States for 183 days or more in the taxable year of the sale and certain other conditions are met. In the case of "effectively connected" gains realized by a corporate non-U.S. Holder, the corporate non-U.S. Holder may, under certain circumstances, be subject to an additional "branch profits tax" at a 30% rate.

Although non-U.S. Holders generally are exempt from backup withholding and information reporting requirements, a non-U.S. Holder may be required to comply with certification and identification procedures in order to establish its exemption from information reporting and backup withholding.

6.7 Exchange Controls and Limitations

Payments in foreign currency with respect to certain foreign exchange transactions including international investments between Colombian residents and non-Colombian residents must be conducted through the foreign exchange market. Therefore, any foreign currency income or expense under the ADRs must be completed through the appropriate channels of the foreign exchange market. Transactions conducted through the foreign exchange market are made at market rates freely negotiated with authorized foreign exchange intermediaries (local banks, financial corporations, administrators and others) or using a bank accounts opened abroad and registered as compensation account without effective conversion of the currencies into Colombian Pesos. Since September 25, 1999, the Colombian foreign exchange regime is structured under the system of free flotation of the exchange rate, whereby market forces determine the level of exchange rate from time to time.

Foreign portfolio investments must be made through authorized foreign exchange investment management companies. Only brokerage firms, trust companies and investment management companies, subject to the inspection and supervision of the Superintendence of Finance, are allowed to make investments in the local Colombian market on behalf of foreign investors. Such brokerage firms, trust companies and investment management companies also act as the foreign investors' local representatives for tax and foreign exchange purposes.

Colombian law provides that the Colombian Central Bank may intervene in the foreign exchange market at its own discretion at any time (*i.e.*, it may limit the remittance of dividends whenever the international reserves fall below an amount equal to three months of imports). Additionally, from time to time, the Colombian government introduces amendments to the International Investment Statute. Hence, we cannot assure you that the Colombian Central Bank will not intervene in the future imposing restrictions to the free convertibility system currently applicable in Colombia. See section [Risk Review—Risk Factors—Risks Related to Colombia's Political and Regional Environment](#).

Registration of Foreign Investment Represented in Underlying Shares

Colombia's International Investment Statute and the regulations issued by the Colombian Central Bank, which have been amended from time to time through related decrees and regulations, govern the manner in which non-Colombian resident entities and individuals can invest in Colombia and participate in the Colombian securities markets. Among other requirements, the International Investment Statute and Colombian Central Bank regulations mandate registration of foreign investment transactions with the Colombian Central Bank and specify procedures to authorize and administer such foreign investment transactions. Additionally, pertinent information related to foreign investment transactions must be updated on a regular basis (yearly or monthly, depending on the type of information).

Under the International Investment Statute and Colombian Central Bank regulations, the failure of a foreign investor to report or register with the Colombian Central Bank foreign exchange transactions relating to investments in Colombia on a timely basis may (i) prevent the investor from obtaining remittance rights, (ii) constitute an exchange control infraction and (iii) result in financial sanctions.

Notwithstanding the regulations described above, foreign investors who acquire ADRs are not required to directly register this investment with Colombian authorities. Holders of ADRs will benefit from the registration to be obtained by the local custodian for our common shares underlying the ADRs in Colombia. Such registration allows the custodian to convert dividends and other distributions with respect to the common shares into foreign currency and remit the proceeds abroad. If investors in ADRs choose to surrender their ADRs and withdraw common shares, they must retain an administrator, who will act as a local representative for the investments and register their investments in common shares as a portfolio investment through said local representative. The local representative is the brokerage firm, trust company or investment management company that acts on behalf of the holders of the ADRs in Colombia, and the request for registration is made by them.

Colombian residents who acquire ADRs and either receive profits from this investment, surrender their ADRs or liquidate their investment in ADRs must register these operations with the Colombian authorities and comply with applicable regulations through its Colombian brokerage firm.

In obtaining its own foreign investment registration, an investor who surrenders its ADRs and sells common shares may incur expenses and/or suffer delays in the application process. Investors would only be allowed to transfer dividends abroad or transfer funds received as distributions relating to our common shares after their foreign investment registration procedure with the Colombian Central Bank has been completed. In addition, the Depositary's foreign investment registration may also be adversely affected by future legislative changes, but its rights to transfer dividends abroad or profits arising from distributions relating to our common shares must be maintained according to Colombian law and foreign investment treaties entered into by Colombia in force at the time of the registration of the investment, except when Colombia's international reserves fall below an amount equivalent to three months' worth of imports. Prospective purchasers of common shares or ADSs should consult their own foreign exchange advisors.

6.8 Exchange Rates

On April 5, 2021, the Representative Market Exchange Rate was COP\$ 3,679 per US\$1.00. The Federal Reserve Bank of New York does not report a noon-buying rate for Colombian Pesos. The Superintendence of Finance calculates the Representative Market Exchange Rate based on the weighted averages of the buy and sell foreign exchange rates quoted daily by foreign exchange rate market intermediaries including financial institutions for the purchase and sale of U.S. dollars. The Superintendence of Finance also calculates the Representative Market Exchange Rate for each month for purposes of preparing financial statements and converting amounts in foreign currency to Colombian Pesos.

6.9 Major Shareholders

The following table sets forth the names of our major shareholders, and the number of shares and the percentage of outstanding shares owned by them at March 31, 2021:

Table 63 – Major Shareholders

Shareholders	As of March 31, 2021	
	Number of shares	% Ownership
Nation ⁽¹⁾ – Ministry of Finance and Public Credit	36,384,788,417	88.49
Public float	4,731,906,273	11.51
Total	41,116,694,690	100.00

(1) Includes 1,600 shares owned by other state entities.

All our common shares have identical voting rights.

As of February 16, 2021, the registration date of our annual general shareholders' meeting, 1.39% of our common shares were held of record in the form of American Depositary Shares, we had 38 registered holders, and 13,048 beneficiaries of common shares, or ADSs representing common shares, in the United States.

Changes in the Capital of the Company

There are no conditions in our bylaws governing changes in our capital stock that are more stringent than those required under Colombian law, with the exception that the Nation must hold a minimum of 80% in any stock issuance undertaken under Law 1118 of 2006.

6.10 Enforcement of Civil Liabilities

We are a Colombian company. Most of our Directors and executive officers and some of the experts named in this annual report reside outside the United States. All or a substantial portion of our assets and the assets of these persons are located outside of the United States. As a result, it may not be possible for you to affect service of process within the United States upon us or these persons who are residents in Colombia or to enforce against us or these persons who are residents in Colombia judgments in U.S. courts obtained in such courts predicated upon the civil liability provisions of the U.S. federal securities laws. Colombian courts will enforce a U.S. judgment predicated on the U.S. securities laws through a procedural system known under Colombian Law as "exequatur." The Colombian Supreme Court will enforce a foreign judgment, without reconsideration of the merits only if the judgment satisfies the requirements set forth in Articles 605 through 607 of Law 1564 of 2012 (*Código General del Proceso*) which entered into force on January 1, 2016, pursuant to *Acuerdo* No. PSAA15-10392, of October 1, 2015, issued by the Colombian Superior Council of the Judiciary (*Consejo Superior de la Judicatura*), as follows:

- A treaty exists between Colombia and the country where the judgment was granted relating to the recognition and enforcement of foreign judgments or, in the absence of such treaty, there is reciprocity in the recognition of foreign judgments between the courts of the relevant jurisdiction and the courts of Colombia;
- The foreign judgment does not relate to "in rem rights" vested in assets that were located in Colombia at the time the suit was filed;

- The foreign judgment does not contravene or conflict with Colombian laws relating to public order other than those governing judicial procedures;
- The foreign judgment, in accordance with the laws of the country where it was rendered, is final and is not subject to appeal;
- A duly legalized copy of the judgment (together with an official translation into Spanish if the judgment is issued in a foreign language) has been presented to the Supreme Court of Colombia;
- The foreign judgment does not refer to any matter upon which Colombian courts have exclusive jurisdiction;
- No proceeding is pending in Colombia with respect to the same cause of action, and no final judgment has been awarded in any proceeding in Colombia on the same subject matter and between the same parties;
- In the proceeding commenced in the foreign court that issued the judgment, the defendant is served in accordance with the laws of such jurisdiction and in a manner reasonably designated to give the defendant an opportunity to defend against the action; and
- The legal requirements pertaining to the exequatur proceedings have been observed.

The United States and Colombia do not have a bilateral treaty providing for automatic reciprocal recognition and enforcement of judgments in civil and commercial matters. The Colombian Supreme Court has in the past accepted that reciprocity exists when it has been proven that either a U.S. court has enforced a Colombian judgment or that a U.S. court would enforce a foreign judgment, including a judgment issued by a Colombian court. However, such enforceability decisions are considered by Colombian courts on a case-by-case basis.

Proceedings for enforcement of a money judgment by attachment or execution against any assets or property located in Colombia are within the exclusive jurisdiction of Colombian courts, and such proceedings are conducted in Spanish. All parties affected by a foreign judgment in exequatur proceedings must be summoned to the exequatur proceedings in accordance with the rules that apply to the Colombian courts. In the course of such proceedings, both the plaintiff and the defendant are afforded the opportunity to request that evidence be collected in connection with the requirements listed above. In addition, before the judgment is rendered, each party may file final allegations in support of such party's position regarding the abovementioned requirements.

Assuming that a foreign judgment complies with the standards set forth in the preceding paragraphs and the absence of any condition referred to above that would render a foreign judgment not subject to recognition under Colombian law, such foreign judgment would be enforceable in Colombia in an enforcement proceeding under the laws of Colombia, provided that the Colombian Supreme Court has previously granted exequatur upon the foreign judgment.

7. **Corporate Governance**

Since 2004, Ecopetrol S.A. has voluntarily adopted transparency, governance and control practices to facilitate corporate governance in order to generate confidence among stakeholders and ensure the sustainability of its business.

The corporate governance practices at Ecopetrol S.A.:

- Promote and guarantee all stakeholders transparency, objectivity and competitiveness;
- Add value to the company and attract investors;
- Protect shareholders, investors and stakeholders' rights;
- Encourage financial markets confidence; and
- Accomplish the highest corporate governance standards.

Corporate Governance System

Corporate governance is the system of rules and practices that govern the decision-making process between the governing bodies of the Ecopetrol Group, as well as the relationships between the companies that comprise it. Corporate Governance in Ecopetrol is more than a key element for organizational management—it is a strategy enabler that our stakeholders value and monitor continuously, as it generates trust, sustainable results over time and results in long-term value relationships.

Our model is structured based on the law, international standards, good practices and the strategy of the Ecopetrol Group, in order to ensure adequate decision-making of the governing bodies of the Ecopetrol Group in terms of agility, clarity and consistency, as well as the promotion of the realization of synergies between Ecopetrol and the Ecopetrol Group companies.

To leverage the business strategy, Ecopetrol has a Corporate Governance System that aims to provide a consistent, sustainable and objective framework for action to safeguard Ecopetrol's governance as well as generate synchrony and articulation with the companies of the Ecopetrol Group. The main elements of this system are:

- i. Boards of Directors: Ecopetrol and Subsidiaries
 - a. Promote best management practices in the Boards of Ecopetrol and in the other Ecopetrol Group's companies.
 - b. Ensure alignment of the strategy under the Ecopetrol Group's management by segments.
- ii. Senior Management Committees
 - a. Establish the structure of the Senior Management Committees (operating, monitoring and improvement mechanisms).
 - b. Optimize Ecopetrol senior management time.
- iii. Matrix of Decisions and Attributions
 - a. Define the key or more relevant decisions of the Ecopetrol Group.
 - b. Establish which governing bodies are responsible for making key decisions.
 - c. Define how these decisions are made.
- iv. Relationship Model
 - a. Establish the way in which the areas within the Ecopetrol Group's scope are related to the Ecopetrol Group's companies.
 - b. Capture the Ecopetrol Group's synergies.
 - c. Manage articulation through management or administration by segments.

Statement of the Nation as Majority Shareholder

Ecopetrol's majority shareholder (the Nation, represented by the Ministry of Finance and Public Credit), is unilaterally committed to protect the interests of the minority shareholders in the following topics:

- *Composition of Board of Directors:* including in its list of candidates a Representative for hydrocarbon producing departments operated by Ecopetrol and a Representative for the minority shareholders, who will be chosen by the 10 shareholders with the largest stock participations. According to corporate governance practices recommended by the OECD, an organization to which Colombia has been a member since 2018, the Government implemented the practice of eliminating the participation of Directors with a ministerial level in the company's Board of Directors. Therefore, in 2019 the Government nominated one (1) non-independent Director without ministerial rank. The current Board of Directors is composed by eight (8) independent members and one (1) non-independent member.
- *Dividend policy:* guaranteeing the right of each shareholder to receive his pro rata dividends in accordance with Colombian law.
- *Issues not included in the agenda of extraordinary meetings of the General Shareholders Assembly:* permitting a vote on those initiatives submitted by one or more shareholders representing at least 2% of the subscribed shares of the company.

- *Asset disposal*: ensuring that any asset disposal of an amount equal or higher than 15% of the stock exchange capitalization of Ecopetrol is discussed and decided by the General Shareholders' Assembly and that the Nation will only vote affirmatively if the vote of minority shareholders is equal to or exceeds 2% of the shares subscribed by shareholders other than the Nation.

7.1 Bylaws

The Bylaws of Ecopetrol S.A. are contained in Public Deed No. 5314 of December 14, 2007, issued by the Second Notary of Bogotá; amended by Public Deed No. 560 of May 23, 2011, issued by the Notary Forty-Six of Bogotá, Deed No. 666 of May 7, 2013, issued by the Notary Sixty-Five of Bogotá, Deed No. 1049 of May 19, 2015, issued by the Notary Second of Bogotá, Deed No. 0685 of May 2, 2018, issued by the Notary Twenty of Bogotá and Deed No. 888 of May 28, 2019 issued by the Notary Twenty Third of Bogotá, Deed No. 6527 issued by the Notary Twenty Nine of Bogotá of June 08, 2020. In addition, the bylaws were amended in the ordinary meeting of the General Shareholders Assembly held on March 26, 2021. The text of the amended bylaws is yet to be recorded in public deed and registered before the mercantile registry, which in Colombia corresponds to the Chamber of Commerce. An English translation of the amended bylaws is included as Exhibit 1.1 to this annual report.

This summary does not purport to be complete and is qualified by reference to our bylaws, which are filed as an exhibit to this annual report. For a description of the provisions of our bylaws relating to our Board of Directors and its committees, see the sections *Corporate Governance—Board of Directors—Board Practices* and *Corporate Governance—Board of Directors—Board Committees*.

General Shareholders' Meeting

Shareholders' meetings may be ordinary or extraordinary. Ordinary meetings will take place in our legal domicile located in Bogotá, Colombia, within the first three months following the end of each fiscal year, on the day and at the time set forth in the notice for the General Shareholders' Meeting. The call for the General Shareholders' Meeting is published on the Ecopetrol S.A. website and in a newspaper of national circulation 30 calendar days prior to the date on which the meeting will take place and on the Sunday previous to the meeting, must be published at Ecopetrol S.A.'s website www.ecopetrol.com.co.

The Annual General Shareholders' Meeting provides shareholders with the opportunity to make key management decisions reserved to shareholders. At the General Shareholders' Meeting, our Board of Directors and the external auditor are appointed. Decisions are taken regarding the company's annual financial statements, profit distribution, audit and management reports, including our corporate governance report and sustainability report, and any other matter provided under applicable law or our corporate bylaws.

Extraordinary Shareholders' Meetings are summoned by our Board of Directors, by our president or chief executive officer, by our external auditor, or by shareholders holding at least 5% of the outstanding shares, or when unforeseen or urgent needs of the Company require it. An Extraordinary Shareholders' Meeting should be called no later than 15 calendar days prior to the date of the meeting. The only exception is when the Law requires a greater time between the summons and the meeting. Such notice to the Extraordinary Shareholders' Meeting is published on the Ecopetrol S.A. website and in a newspaper of national circulation. The notice informs the agenda for the meeting to the company's shareholders.

For both the ordinary and extraordinary meetings, the quorum required is a plural number of shareholders representing 50% plus one of the subscribed shareholders entitled to vote. Decisions are approved with a majority of the members present. This quorum is exempted in the case of "second-call meetings," which may take place when a meeting fails to obtain the required quorum and is called within a period between 10 business days and 30 business days from the first date, in which case decisions may be adopted by a majority of the shares present regardless of the number represented.

Decisions made at ordinary and extraordinary shareholders' meeting must be approved by a plural number of shareholders representing the majority of the shares present. Colombian law requires higher majorities in the following cases:

- The vote of at least 70% of the shares present and entitled to vote at the ordinary shareholders' meeting is required to approve the issuance of stock not subject to preemptive rights;
- The vote of at least 78% of the shares represented entitled to vote is required to approve the distribution of the annual net profits. In the absence of this special majority, at least 50% of the net profits must be distributed. If the sum of all legal reserves (statutory, legal and optional) exceeds the amount of the outstanding capital, the Company must distribute at least 70% of the annual net profits;
- The vote of at least 80% of the shares represented is required to approve the payment of dividends in shares; and
- The vote of 100% of the outstanding and issued shares is required to replace a vacancy on the Board of Directors without applying the electoral quotient system.

Shareholders may be represented by proxies, provided that the proxy: (i) is in writing (faxes and electronic documents are valid), (ii) specifies the name of the representative, (iii) specifies the date or time of the meeting for which the proxy is given and (iv) includes other information specified by the applicable law. Proxies granted abroad do not require legalization or an apostille.

During our ordinary annual shareholders' meeting, our employees and Directors are only allowed to represent their own shares, unless they act as legal representatives.

In 2020, due to the exceptional situation arising from the COVID-19 pandemic, our annual shareholders' meeting was held virtually for the first time. However, our shareholders were able to follow the meeting through our website and the live broadcast on the National Institutional Channel. We had 2,198 connections via streaming and 134,058 viewers through the National Institutional Channel.

To facilitate the correct representation of its shareholders, Ecopetrol, after review and authorization by the Financial Superintendence of Colombia and the Superintendence of Corporations, provided a digital proxy system through which our shareholders were represented by attorneys provided by the Company, and enabled them to submit their voting decisions. The instructions for the use of this system, the list of proxies, and the forms, were available on our website.

Our 2021 annual shareholders' meeting was held in the same way. Additionally, to guarantee the active participation and rights of the shareholders, the Company provided channels for the submission of proposals that were included in the agenda and a virtual and in-person system to inspect our books and documents. For the 2021 meeting, there were 2,388 connections via streaming and 122,630 viewers through the National Institutional Channel.

Preference Rights and Restrictions Attaching to Our Shares

There are only ordinary shares, and these carry no special rights or restrictions (ordinary shares). Our current shareholders do not have any type of preemptive rights. However, in the case of a future equity offering, we will review whether or not existing shareholders would be entitled to preemptive or similar rights and, if that were the case, the corporate approvals and offering documents for any such equity offering would regulate the subject matter accordingly.

Under Commercial Colombian law, our shareholders have the following economic privileges and voting rights:

- to participate and vote on the decisions of the General Shareholders Assembly;
- to receive dividends based on the financial performance of the Company in proportion to their share ownership;
- to transfer and sell shares according to our bylaws and Colombian law;
- to inspect corporate books and records with 15 business days prior to the ordinary shareholders' meeting where the year-end financial statements are to be approved;

- upon liquidation, to receive a proportional amount of the corporate assets after the payment of external liabilities; and
- to sell the shares, known as right of withdrawal (*derecho de retiro*), if a corporate restructuring affects the economic or voting rights of the shareholders in the terms and conditions established under Colombian law.

Ecopetrol's bylaws provide additional rights to our minority shareholders. These rights include:

Sale of Assets. For a ten-year period counted from the date of subscription of the declaration of the Nation dated February 16, 2018 or until the Nation loses its status as majority shareholder, the Nation guarantees that any sale of 15% or more of our assets requires the approval of the General Shareholders Assembly and that the Nation would only be allowed to vote its shares in favor of the proposal if 2% or more of our minority shareholders accept the proposal.

Candidate List. Pursuant to our bylaws and Law 1118 of 2006, the Nation will include in its candidate list for election of members of the Board of Directors one member selected by the departments that produce hydrocarbons. In addition, pursuant to the declaration of the Nation dated February 16, 2018, the Nation will include in its candidate list for election of members of the Board of Directors one member selected by the ten largest minority shareholders. The minority shareholders' right to select a candidate loses its effect when minority shareholders, according to their share participation, name a member to our Board of Directors.

Extraordinary Shareholders Meetings. Our bylaws provide that the entity exercising permanent control over Ecopetrol must instruct the Company's CEO or External Auditor to call an extraordinary meeting of the Company's shareholders when so requested by a plurality of shareholders holding at least 5% of the total number of outstanding shares. Such requests shall be made in writing and must clearly indicate the purpose of the meeting.

Investor Relations Office. Ecopetrol has an investor relations office, a specialized unit responsible for our shareholders. Pursuant to our bylaws, shareholders holding at least 5% of the total number of shares outstanding may request that the investor relations office conduct a special audit, provided that such audit does not hinder the day-to-day operations of the Company, of the following documents: the income statement; the proposal for the distribution of profits; the report of the Board of Directors as to the economic and financial status of our Company; the report from our general counsel as to the legal status of our Company; and the report from the independent auditors. Special audits cannot be made of documents that contain scientific, technological or statistical information of our Company, or agreements that give us competitive and economic advantages over our competitors, or in respect of any document related to intellectual property. Shareholders also have the right to propose good corporate governance recommendations to the office for the protection of investors.

Others. Pursuant to our bylaws, shareholders holding at least 5% of the total number of shares outstanding may propose recommendations to our Board of Directors pertaining to the management of our Company. Any shareholder may file a written petition to our Board of Directors to investigate corporate governance violations that the shareholder believes to have been committed.

Amendments to Rights and Restrictions to Shares

We have only one class of stock and it has no special rights or restrictions (ordinary shares). Our shareholders do not have any type of preemptive rights. The rights given to our shareholders by law are described in our bylaws and may only be modified through an amendment to the law.

The additional rights given to our minority shareholders in our bylaws and corporate governance code may only be modified through an amendment of those internal documents.

Limitations on the Rights to Hold Securities

There are no limitations in our bylaws or Colombian law on the rights of Colombian residents or foreign investors to own the shares of our Company, or on the right to hold or exercise voting rights with respect to those shares, except in cases of legal representation.

Restrictions on Change of Control, Mergers, Spin-offs or Transformations of the Company

Under Colombian law and our bylaws, the General Shareholders Assembly has full authority to approve any mergers, spin-offs or transformations, subject to compliance of applicable law. Corporate restructurings are subject to the requirement that the Nation must hold a minimum of 80% of our common stock in any issuance of stock pursuant to Law 1118 of 2006.

Ownership Threshold Requiring Public Disclosure

The Corporate Governance Code, Title III, Chapter 1, Section 5, states: Identification of Major Shareholders. The shareholding composition of the Company, indicating at least the twenty (20) people with the greatest number of shares, is disclosed on Ecopetrol's website at www.ecopetrol.com.co. Colombian securities regulations set forth the obligation to disclose any material event or *hecho relevante*. Any transfer of shares equal or greater than 5% of our capital stock, or any legal entity or individual acquiring a percentage of shares that would make him the beneficial owner of 5% or more of our capital stock, is a material event, and therefore, must be disclosed to the Superintendence of Finance. The regulation includes other criteria in order to identify when to report a material event other than the situations described in the previous sentence.

External Auditor

Pursuant to our bylaws, the external auditor will be appointed for periods of two (2) years and may be reelected consecutively for two (2) periods, and it may once again be hired after one (1) period away from the position.

7.2 Code of Ethics and Conduct

Our recently updated Code of Ethics and Conduct considers, as ethical principles of the organization, the integrity, responsibility, respect and commitment to life. Our Code of Ethics and Conduct also states that we must comply with the provisions contained in the applicable national and international laws in the countries where we have operations, including the U.S. and Colombia.

In our Code, we define the guidelines for the following aspects: conflict of interest; ethical conflict; prohibition of bribery, other forms of corruption and violations of the FCPA; integrity in accounting; prevention of money laundering and financing of terrorism; gifts, amenities and hospitalities; protection and use of resources; information management; security and confidentiality; prohibition of insider trading and use of inside information, environmental policy, social responsibility, respect for human rights and rejection of discrimination, antitrust and anticompetitive practices and sexual harassment in the workplace; whistleblowing channel; and examples of ethical behaviors. As part of the Ethics guidelines of Ecopetrol, facilitation payments, political contributions and donations, diversion of money from social investment activities or sponsorships towards political activities or other than the purposes established by the Company and lobbying are prohibited.

Our Code of Ethics and Conduct applies to our Board of Directors, our Chief Executive Officer, our Chief Financial Officer, principal accounting officer, persons performing similar functions, to all of the other employees of the company and its affiliates and all individuals or legal entities that have any relationship with it, including beneficiaries, shareholders, contractors, suppliers, agents, partners, customers, allies (included joint ventures) and suppliers, in addition to the personnel and companies that the contractors engage for the execution of the agreed activities.

All our agreements with suppliers or third parties include a provision relating to compliance with applicable anti-bribery and anti-corruption regulations. These agreements also require our suppliers and third parties to accept our Code of Ethics and Conduct and our compliance manuals.

Our Code of Ethics and Conduct is available on our website at:

<https://www.ecopetrol.com.co/wps/portal/Home/en/Ourcompany/Ethics%2C%20Transparency%20and%20Compliance%20Program/Code%20of%20Ethics%20and%20Conduct%20of%20the%20Ecopetrol>

7.3 ***Board of Directors***

The current Board of Directors was elected at the General Shareholders Ordinary Meeting held on March 26, 2021, for a two-year term beginning on April 9, 2021.

The current Board of Directors is composed as follows:

Non-independent member:

- Germán Eduardo Quintero Rojas.

Independent members:

- Cecilia María Vélez White
- Luis Guillermo Echeverri Vélez
- Juan Emilio Posada Echeverri
- Sergio Restrepo Isaza (as financial-accounting expert)
- Luis Santiago Perdomo Maldonado
- Esteban Piedrahita Uribe
- Hernando Ramírez Plazas (nominated by the oil producing departments in which Ecopetrol operates)
- Carlos Gustavo Cano Sanz (nominated by ten (10) minority shareholders with major shareholding)

The information below sets forth the names and business experience of each of the Directors elected at the General Shareholders Ordinary Meeting held on March 26, 2021 for a two-year term beginning on April 9, 2021:

Germán Eduardo Quintero Rojas has served as General Director of Fogafin, President of the National Hydrocarbons Agency, Secretary General of the Ministry of Mines and Energy, Interior and Finance and Public Credit, as well as Secretary General and Advisor to the Ministry of Commerce, Industry and Tourism, and Advisor to the Secretary General of the Office of the President of the Republic of Colombia. He has also served as Director General and Secretary General of Acción Fiduciaria S.A. and Head of the Legal Office of the Ministry of Finance of Public Credit, among other positions in the public and private sectors. He is an attorney with a degree from Sergio Arboleda University, and studies in Administrative Law from Javeriana University. He also carried out studies for a doctorate in an administrative law program from San Pablo CEU University of Madrid, where he was a doctorate candidate. He was a member of the drafting commission of the current Code of Administrative Procedures and Administrative Litigation. He has been a member of several top-level national Boards of Directors, highlighting his directorship in Ecopetrol (2019-January 2021) and the Financiera de Desarrollo Nacional (FDN) as well as his service as Chairperson of the Boards of Directors of Bancoldex S.A., Gececla S.A. E.S.P., Urrá S.A. and Cisa, among others. He is a current Director of the Board of Directors of FDN and is Legal Secretary to the Office of the President of the Republic. Mr. Quintero is a non-independent member of the Board of Directors of Ecopetrol S.A.

Cecilia María Vélez White has extensive professional experience, having occupied the following positions in the public sector: Minister of Education of Colombia, Secretary of Education of Bogotá, Minister Counselor for Economic Affairs at the Embassy of Colombia in the United Kingdom, Deputy Director and Head of the Territorial Development Unit at the National Planning Department, Head of Planning of the Urban Development Fund at Banco Central Hipotecario, and Deputy Director of Planning at Banco de la República (National Central Bank). She has served as Dean of Universidad Jorge Tadeo Lozano and was Visiting Professor at the Graduate School of Education at the same University. She studied Economics at Universidad de Antioquia from 1972-1976 and received her degree from Universidad Jorge Tadeo Lozano in 1977. She also holds a Master's degree in Economics from the University of Louvain in Belgium and was a Fellow at the Special Urban and Regional Studies program (SPURS) at Massachusetts Institute of Technology (MIT) in Boston. She is currently a member of several Boards of Directors and Advisory Boards, including: Suramericana de Seguros, Fedesarrollo, Eafit, Fundación Luker, United Way, and Empresarios por la Educación. She assists on the Advisory Board of the Harvard Ministerial Leadership Program and provides advisory and consulting services. Mrs. Vélez is an independent Director of the Board of Directors of Ecopetrol S.A.

Luis Guillermo Echeverri Vélez has over 30 years of experience in the development, marketing, stimulation and performance of international business, exports and imports and in the preparation and implementation of public and corporate policies, the development and implementation of conventional projects as well as those relating to information technology, strategic planning, financing of public and private projects and the obtainment of funds and resources. His professional practice includes experience as an international business advisor. He served as Executive Director of the Inter-American Development Bank, the Inter-American Investment Corporation and the Multilateral Investment Fund on behalf of the Governments of Colombia, Peru, and Ecuador. He was Director and Founder of various companies and large projects between 2000 and 2010. He served as Commercial Attaché in Colombia's Diplomatic Mission to the US and Director of the Regional Office of Proexport (now ProColombia) in Miami. Mr. Echeverri is an attorney with a degree from Universidad Pontificia Bolivariana de Medellín and also holds a Master in Agricultural Economics from Cornell University in New York. In his position as international business advisor, he has successfully directed business initiatives as well as change, innovation, methodological and technological implementation processes in various companies and organizations. He successfully managed the presidential campaign of Iván Duque Márquez, present President of the Republic of Colombia. Currently, Mr. Echeverri is President of the Asociación Primero Colombia, a nonprofit think tank dedicated to promoting democratic values and youth leadership; former Chairperson and member of the Board of Directors of the Chamber of Commerce of Bogotá and member of the Board of Directors of Telefónica, Pragma and Colmédica. He serves as an independent Director and Chairperson of the Board of Directors of Ecopetrol S.A.

Juan Emilio Posada Echeverri has been a Board Member and Advisory Council Member for many public and private, both profit and nonprofit organizations in the areas of infrastructure, air transportation, hospitality, national defense, banking, insurance, securities brokerage, telecommunications, technology, media, education, children's rights, chambers of commerce and business associations, as well as in a Latin American youth orchestra and a national competitiveness program, in which he led the private portion of the initiative. He has held senior management positions at Billiton M & T (then a subsidiary of Royal Dutch Shell Group) in the Netherlands as well as Banco Cafetero in New York and Miami, where he also served as International Vice President and was responsible for its subsidiaries and investments in seven countries. Founder, Executive Chairperson and CEO of Grupo Fast S.A. and Fast Colombia S.A.S. - VivaAir (formerly VivaColombia, the first low cost airline in Colombia); Founder and CEO of Stratis Ltda. (infrastructure projects); Corporate Director of Synergy Aerospace; CEO of Avianca Airlines, Alianza Summa (Avianca-Aces-Sam) and Aces Airlines; CEO of Puerto Brisa, a deep water mega-port in Colombia; Executive Chairperson of Taxisimo Ltd, Chairperson of Direktio and Fundación Plan; Director of Allianz Life and Allianz General in Colombia; Board member of Avianca Holding and Sociedad Hotelera Tequendama (seven hotels in Colombia), Plan International (Brazil) and member of the Nominating and Governance Committee of Plan International's Global Assembly, as well as, a member of the Advisory Councils of Grupo Empresarial del Sector Defensa (GESED), Disán (international fertilizer and chemical products trading company), Flores de la Campiña (producer and exporter of fresh flowers), YPO Gold Colombia (global CEO network), NT3 (real estate project developers), Polymath Ventures, AMROP-Top Management and the Orchestra of the Americas (Washington D. C.). He has been actively involved in fourth industrial revolution ventures and a middle-class housing construction firm. He holds a degree in Business Administration from EAFIT University in Medellín, Colombia, an MBA in International Business and Finance from Pace University in New York graduating with honors in international academic excellence, and a degree in International Finance Law from the London School of Economics. Due to his experience in audit and risk matters, he has been called upon to participate in the finance and audit committees of several different Boards of Directors, including that of the Banco Nacional del Comercio, Corredores Asociados (a stock brokerage firm in Colombia), and is held in high regard by the financial sector in general. He has received numerous awards such as the Cruz de Boyacá, Grado Gran Cruz, EY's 2016 Emerging Entrepreneur Award, multiple medals from the Colombian Armed Forces and 10 Best Junior Chamber of Commerce Executives, among others. The companies under his leadership have also received awards and recognitions in service and quality, such as the Portafolio Award for Service, and recognitions from Fenalco Antioquia, Cotelco and the Government of Antioquia. Currently, he has a consulting agreement with the International Cooperation Agency, United Nations Development Program (UNDP), is a member of the Board of Directors of Financiera de Desarrollo Nacional (FDN) and of Sociedad de Acueducto de Alcantarillado y Aseo de Barranquilla S.A. E.S.P. and is an independent Director of the Board of Directors of Ecopetrol S.A.

Sergio Restrepo Isaza served as Vice President of Capital Markets and Executive Vice President of Corporate Development at Grupo Bancolombia. He began his professional career at Corporación Financiera Cofinsura, where he served as CEO, Vice President of Investment Banking and Investment and International Vice President. He has been a member of several Boards of Directors including Cementos Argos, Compañía Nacional de Chocolates, Conavi, Asobancaria, Bolsa de Valores de Colombia, Conglomerado Financiero Internacional Banagrícola S.A., Suramericana Asset management SUAM and several others in the community sector. He holds a degree in Business Administration from EAFIT University in Medellín, Colombia, and an MBA from Stanford University in California. He has extensive experience in audit and risk matters, having served as member of several audit and risk committees during in different companies his time in the financial sector, where he played an active role in the analysis of financial information and was also responsible for investor relations. Currently he is partner at Exponencial Banca de Inversión S.A.S., member and Chairperson of the Board of Directors of Grupo BIOS S.A.S., a member of the Board of Directors of Odinsa S.A. Mineros S.A. and Consorcio Financiero. He is an expert in financial, auditing and business risk matters and an independent Director of the Board of Directors of Ecopetrol S.A.

Luis Santiago Perdomo Maldonado has over 40 years of experience in the Colombian banking industry, having held senior management positions, including that of CEO of Banco Colpatria, part of the Scotiabank Group. He has been a member of several Boards of Directors in Colombian and Latin American companies in various economic sectors including finance, mining and agriculture, in organizations such as Banco Latinoamericano de Comercio Exterior (Bladex), Scotiabank Peru, Asociación Bancaria de Colombia, Deceval, Asociación Nacional de Empresarios de Colombia (ANDI) and Asociación Nacional de Instituciones Financieras (ANIF). He is also a Founding Member of the Colombian Institute of Corporate Governance, and serves as CEO of Grupo Mercantil Colpatria S.A. He has been a member of the Boards of Directors of Colegio de Estudios Superiores (CESA), Fundación de Cirugía Reconstructiva (CIREC) and the Plenary Council of Gimnasio Moderno, as well as having collaborated with the Fundación Universitaria Minuto de Dios. He holds a degree in Business Administration from the Colegio de Estudios Superiores de Administración (CESA). He is currently a member of the Board of Directors of Mineros S.A., and serves as an independent Director of the Board of Directors of Ecopetrol S.A.

Esteban Piedrahita Uribe is currently Chairperson of the Chamber of Commerce of Cali. He previously held the positions of General Director at Departamento de Planeación Nacional, Advisor to the President and then Senior Specialist at the Inter-American Development Bank, Economic Editor of *Semana* magazine and General Manager of Endriven Colombia/Gas Meridional S.A.S. E.S.P., among others. He has been a member of the Boards of Directors of Banco Agrario, Carvajal Educación and Alianza Valores, and a member of the Advisory Council for Colombia at The Nature Conservancy. He holds a degree in Economics from Harvard University and a master's degree in Philosophy and History of Science from the London School of Economics and Political Science. He is currently a member of the Boards of Directors of Fedesarrollo, Cementos Argos, Centro de Eventos Valle del Pacífico, and of the Advisory Council of the Fundación Panthera, and is an independent Director of the Board of Directors of Ecopetrol S.A.

Hernando Ramírez Plazas has been the Dean of the School of Engineering, Academic Vice-Rector, Rector and Professor at Universidad Sucolombiana. He worked at the National Institute of Health and the Ministry of Health and served as external evaluator of Colciencias in technological development and innovation projects in the area of natural gas. He also participated as a trainer in gas issues for the production staff at Canacol Energy. He holds a degree in Chemical Engineering from the Universidad Nacional de Colombia, a master's degree in Public Health from the same university and a Specialist degree in Gas Engineering from the Universidad de Zulia (Venezuela). Currently, he is an independent Director of the Board of Directors of Ecopetrol S.A. nominated by the Hydrocarbon Producing Departments since March 23, 2018.

Carlos Gustavo Cano Sanz holds a degree in Economics from Universidad de los Andes in Bogotá, a master's degree from Lancaster University in England, a postgraduate degree in Government, Business and International Economics from Harvard University in Boston, and a postgraduate degree from the Instituto de Alta Dirección Empresarial (INALDE) in Bogotá. He has been Chairperson of the Federación Nacional de Arroceros (FEDEARROZ), Chairperson of the Sociedad de Agricultores de Colombia (SAC), founder and Chairperson of Corporación Colombia Internacional (CCI), Chairperson of Caja Agraria and Chairperson of *El Espectador* (newspaper). He was Minister of Agriculture in the administration of President Álvaro Uribe, between August 7, 2002 and February 3, 2005, and Director of Banco de la República between February 4, 2005 and January 31, 2017. He is currently a Professor at Universidad de los Andes, member of the Board of Trustees of Universidad EAFIT in Medellín, of the Advisory Committee for Agriculture at Bancolombia, of the Advisory Council for Colombia of The Nature Conservancy (TNC) and of the Board of Directors of Minka S.A.S. Additionally, since March 31, 2017, he is an independent Director of the Board of Directors of Ecopetrol S.A., nominated by the minority shareholders with the largest shareholding in Ecopetrol, Vice Chairperson of said Board of Directors and Chairperson of its Business Committee. His latest published book is "*Mi paso por el Banco: Desaprendiendo y aprendiendo*" published by Banco de la República and Universidad de Ibagué on March 2020.

7.3.1 Board Practices

Our Board of Directors is composed of nine members and is responsible for, among other things, establishing our general business policies. The majority of the Board of Directors must be independent, and must be elected pursuant to the criteria set out in paragraph two, Article 44, Law 964, 2005, and in accordance with the procedure determined in Decree 3923, 2006, or any other provisions that regulate, amend, replace or add such regulations. In addition, pursuant to our bylaws and in accordance with the procedures described therein, our majority shareholder must include, in its list of candidates for the last two seats in the Board of Directors, the name of one individual jointly proposed by departments that produce hydrocarbons and one individual jointly proposed by the ten minority shareholders with the highest equity participation. According to Colombian law, the members of the Board of Directors must be elected by the General Shareholders Assembly in accordance with a proportional representation system similar to cumulative voting (through an electoral quota voting system). The number of votes required to fill each position is calculated by dividing the number of possible votes by the number of open board positions. The members of the Board of Directors may be elected without an electoral quota voting system when there is unanimity. Pursuant to our bylaws, (i) positions on our Board of Directors are filled either by person or by position, (ii) at least three members appointed for a specific period must be nominated for the following period, and (iii) beginning in 2019, Directors will be elected for a two-year term. Currently, we have one Director appointed by his position without Ministerial rank. Our current Directors were elected at the General Shareholders Assembly held on March 26, 2021. Members of the Board may be reelected indefinitely.

Our CEO is appointed by the Board of Directors and will have at least two alternates. The CEO is elected for a two-year term, may be reelected indefinitely and freely removed prior to the expiration of his term. In accordance with our bylaws, the Board of Directors must evaluate the annual performance of the CEO, and such results must be published in Ecopetrol's web page or in an alternative media vehicle.

The compensation of our Directors is set exclusively by the shareholders at the General Shareholders Assembly. Directors are compensated for attending board meetings and committee meetings. A Board meeting requires a quorum of at least five members and decisions are approved with a majority of the Directors present. In the practice a consensus decision making operates in the Board.

Under Colombian law, a director or executive officer must abstain from participating in any transaction that may result in a conflict of interest or that involves competing with the company, unless authorized at a General Shareholders Assembly. The general shareholders may approve or reject the transaction giving rise to the conflict of interest with the vote of the majority of the shares present at the General Shareholders Assembly. If the director or executive officer who has the conflict is a shareholder, his or her vote must be excluded. We disclose the number of conflicts of interest of our employees, executive officers and Directors in our annual reports.

Neither our bylaws nor our corporate governance code provide a retirement age for our Directors. Under our bylaws, there is no requirement for a person to have a minimum number of shares to be elected as a Director. Colombian law provides that Directors willing to sell or purchase shares in our Company need prior authorization from the entire Board of Directors. Colombian law does not impose any limitation as to the number of shares that may be acquired by a Director.

7.3.2 Board Committees

Pursuant to our bylaws, our Board of Directors has the ability to constitute the committees it considers necessary. The Board of Directors currently has six committees (audit and risk committee, corporate governance and sustainability committee, remuneration, appointments and culture committee, business committee, HSE (health, security and environment) committee and technology and innovation committee). These committees establish guidelines, set specific actions and evaluate and submit proposals designed to improve performance in the areas under their supervision and control. The committees are comprised of members of the Board of Directors who are also appointed by the same members. The chairman of each of the committees must be an independent Director. In addition to applicable regulations, the committees also have their own specific regulations that establish their purposes, duties and responsibilities.

Table 64 – Composition of committees of the Board of Directors as of March 26, 2021*

Audit and Risk Committee Sergio Restrepo Isaza (President and Financial Accounting Expert) Hernando Ramírez Plazas Santiago Perdomo Maldonado Juan Emilio Posada Echeverri	Remuneration, Appointments and Culture Committee Juan Emilio Posada Echeverri (President) Santiago Perdomo Maldonado Germán Eduardo Quintero Rojas** Esteban Piedrahita Uribe Orlando Ayala Lozano
Corporate Governance and Sustainability Committee* Esteban Piedrahita Uribe (President) Orlando Ayala Lozano*** Carlos Gustavo Cano Sanz Juan Emilio Posada Echeverri Luis Guillermo Echeverri Vélez	New Business Committee Carlos Gustavo Cano Sanz (President) Hernando Ramírez Plazas Sergio Restrepo Isaza Juan Emilio Posada Echeverri Esteban Piedrahita Uribe
HSE Committee Hernando Ramírez Plazas (President) Carlos Gustavo Cano Sanz Germán Eduardo Quintero Rojas**	Technology and Innovation Committee Luis Guillermo Echeverri (President) Orlando Ayala Lozano*** Germán Eduardo Quintero Rojas** Sergio Restrepo Isaza Carlos Gustavo Cano Sanz Santiago Perdomo Maldonado

* The composition may be modified after this annual report in accordance with the election of the Board of Directors at the General Shareholders Ordinary Meeting on March 26, 2021.

** Member of this Committee since April 2019 until January 12, 2021. He was elected again at the General Shareholders Ordinary Meeting on March 26, 2021.

*** Not elected to the Board of Directors at the General Shareholders' Ordinary Meeting on March 26, 2021. Replacement will be elected to the Committee after this annual report.

Audit and Risk Committee

Our audit and risk committee, which must be comprised of at least three members, all of them independent Directors, is our highest internal control body and provides support to our Board of Directors on risk, accounting and financial matters. It is in charge of guaranteeing the design, implementation and supervision of our internal control over financial reporting. It also ratifies the annual hydrocarbons reserves report and provides support for our Board on analyzing topics related to financial matters, risks, control, environment and the assessment of the Company's internal and external auditors.

All committee members are required to be knowledgeable in accounting matters and at least one of them is required to be an expert in financial and accounting matters.

Our Board of Directors has determined that Sergio Restrepo Isaza qualifies as an "audit committee financial expert" and he is independent under the definition of "independent" applicable to us under the rules of the NYSE.

The audit and risk committee approves on a case-by-case basis any engagement of our external independent auditors to provide services different than those related to auditing our financial statements. The audit and risk committee reviews that the additional services do not affect the external auditor's independence.

Remuneration, Appointments and Culture Committee

Our remuneration, appointments and culture committee, which must be comprised of at least three members, including at least one independent director, provides general guidelines for the selection and compensation of our executive officers and employees, and within the framework of the Ecopetrol Group’s strategy, oversee matters of organizational culture.

Corporate Governance and Sustainability Committee

Our corporate governance and sustainability committee, which must be comprised of at least three members, including at least one independent director, supports the Board of Directors in the analysis and decision making related to systems for the adoption of best practices in corporate governance for the oil and gas industry, which include matters related to the adoption of specific measures regarding the Ecopetrol Group’s governance. This Committee also supports the analysis and makes recommendations related to the Ecopetrol Group’s sustainability agenda and TEGS topics.

New Business Committee

Our new business committee, which must be comprised of at least five members, including at least one independent Director, assists our Board in analyzing potential business ventures. Based on its delegation of power, the committee studies and analyzes capital expenditure policies, major investment projects, strategy, new business and other matters that would help us move forward in our efforts toward the consolidation of our strategy. The primary criteria used in the committee’s decision-making process are the optimization of our portfolio and the proper allocation of our resources.

HSE Committee (Health, Safety and Environment)

Our HSE Committee, which must be comprised of at least three members, the majority of which must be independent, supports the management of the Board of Directors with respect to monitoring and management of risks associated with the health and safety of our employees, contractors and partners, The HSE Committee is also responsible for monitoring Ecopetrol’s environmental management strategy, which includes matters related to the adoption of specific metrics regarding, for example, decarbonization.

Technology and Innovation Committee

Our technology and innovation committee, which must be comprised of at least three members, the majority of which must be independent, supports the management of the Board of Directors with respect to technological and digital transformation, as well as the cultural change that Ecopetrol is undergoing to transform itself into a leading company in the use of technology and digital innovation in the hydrocarbons sector. Starting in 2020, the Technology & Innovation Committee also reviewed TEGS-related topics starting 2020.

7.4 Compliance with NYSE Listing Rules

The following is a summary of the significant differences between our corporate governance practices and those required for U.S. companies under the NYSE listing standards.

NYSE Standards	Our Corporate Governance Practices
<i>Director Independence</i> The majority of the board of directors must be independent. §303A.01. “Controlled companies,” which would include Ecopetrol if we were a U.S. issuer, are exempt from this requirement. A controlled company is one in which more than 50% of the voting power is held by an individual, group or another company, rather than the public. §303A.00.	Pursuant to our bylaws, the majority of the Board of Directors must be independent. As of the date of this annual report, we have eight independent Directors and one non-independent Director without Ministerial rank.

NYSE Standards***Executive Sessions***

The non-management directors of each listed company must meet at regularly scheduled executive sessions without management. §303A.03.

Nominating/Corporate Governance and Sustainability Committee

A nominating/corporate governance and sustainability committee composed entirely of independent directors is required. The committee must have a charter specifying the purpose, duties and evaluation procedures of the committee. §303A.04. "Controlled companies" are exempt from these requirements. §303A.00.

Compensation Committee

A compensation committee composed entirely of independent directors is required, which must evaluate and approve executive officer compensation. The committee must have a charter specifying the purpose, duties and evaluation procedures of the committee. §303A.05. "Controlled companies" are exempt from this requirement. §303A.00.

Audit and Risk Committee

An audit committee with a minimum of three independent directors satisfying the independence and other requirements of Rule 10A-3 under the Exchange Act and the more stringent requirements under the NYSE standards is required. §§303A.06 and 303A.07.

Equity Compensation Plans

Equity compensation plans and all material revisions thereto require shareholder approval, subject to limited exemptions. §§303A.08 and 312.03.

Listed companies must adopt and disclose corporate governance guidelines. §303A.09.

Our Corporate Governance Practices

A comparable rule does not exist under Colombian law. Except for our audit and risk committee, our Board of Directors does not meet without management.

Colombian law does not require the establishment of a nominating and a corporate governance and sustainability committee composed entirely of independent directors. Pursuant to our board charter, these committees shall be composed of a majority of independent Directors.

Colombian law does not require the establishment of a compensation committee composed entirely of independent directors. Pursuant to our board charter, this committee shall be composed of a majority of independent Directors.

According to Law 964 of 2005, Colombian companies that are authorized to issue securities by the Superintendence of Finance must have an audit committee that satisfies the requirements of Law 964 of 2005, including its minimum number of members, independence criteria and audit related duties. Our audit and risk committee is composed entirely of independent Directors, and the committee meets the requirements of Law 964 of 2005 and Rule 10A-3 under the Exchange Act.

Under Colombian law, no similar right to vote on equity compensation plans and material revisions thereto is given to shareholders. We do not give our shareholders the right to vote on equity compensation plans and material revisions thereto.

The Superintendence of Finance recommends the adoption of corporate governance guidelines to all Colombian issuers. According to Superintendence of Finance Circular No. 028, 2014, the adoption of corporate governance guidelines is voluntary. Listed companies must annually publish a corporate governance survey comparing their corporate governance standards with those recommended by the Superintendence of Finance. Our corporate governance code and our survey of the adoption of Colombian practices are available on our website at <http://www.ecopetrol.com.co>.

NYSE Standards**Code of Ethics for Directors, Officers and Employees**

Corporate governance guidelines and a code of business conduct and ethics is required, with disclosure of any waiver for directors or executive officers. The code must contain compliance standards and procedures that will facilitate the effective operation of the code. §303A.10.

Our Corporate Governance Practices

We have adopted a code of ethics which complies with applicable U.S. and Colombian law. Our code of ethics applies to our chief executive officer, chief financial officer, principal accounting officer, persons performing similar functions and to all of the employees, members of the Board of Directors, suppliers, and contractors of Ecopetrol S.A. and its corporate group. Our code of ethics is available on our website at <http://www.ecopetrol.com.co>.

7.5 Management

The following presents information concerning our executive officers and senior management. Unless otherwise noted, the majority of these individuals are Colombian citizens.

Executive Officers

Felipe Bayon Pardo has served as the Chief Executive Officer of Ecopetrol since 2017. Prior to this, Mr. Bayón served as Chief Operating Officer of Ecopetrol since February 2016, overseeing the upstream, midstream, downstream, technology, projects and marketing operations, as well as the research and innovation areas. With over 29 years of experience in the oil and gas industry, Mr. Bayón has led Ecopetrol's transformation process, TSEG strategy and he has managed to position Ecopetrol in strategic basins in the United States, Brazil and Mexico. For more than 20 years, he worked at BP plc, most recently as Senior Vice-President of BP America and Head of Global Deepwater Response. From 2005 to 2010, he was the Regional President of BP Southern Cone (South America), and, prior to 2005, he worked in BP's headquarters as Chief of Staff to the Upstream CEO and Head of the Executive Office for Exploration and Production. He began his career in 1995 in BP Colombia, as a Project Engineer, where he held various positions until becoming Vice-President of Operations in Colombia. Prior to this, he worked for Shell.

Alberto Consuegra Granger has served as Chief Operating Officer of Ecopetrol since March 1, 2019. Prior to this role, he was interim CEO of Cenit S.A.S., Ecopetrol's midstream subsidiary, since February 2018 and Vice-President of Supply and Services of Ecopetrol S.A. since August 2016. Mr. Consuegra holds a degree in civil engineering from the Universidad de Cartagena and a master's degree in pavements and construction management from Texas A&M University. Before joining Ecopetrol, he was Vice-President of Exploration and Production at Equión Energía Limited, where he also served as the Vice-President for Projects and Production between 2011 and 2016. Mr. Consuegra began his professional career in 1984 at Morrison Knudsen International as a contract coordinator during the construction of the Cerrejon project. In 1993, he joined Ecopetrol S.A., working in the Projects Group, and then went to BP Exploration, where he worked for 16 years, first as a contract coordinator, then as procurement and contract manager, then human resource manager for the Andean area, and finally as leader of the Colombian Performance Unit until end of 2010.

Jaime Caballero Uribe has served as the Chief Financial Officer of Ecopetrol since August 2018. Mr. Caballero has over 20 years of international experience in the oil and gas sector. He joined the Ecopetrol Group in 2016 and was the Chief Financial Officer for the Downstream Segment prior to his appointment as the Ecopetrol Group's CFO. Previously, his experience includes 17 years at BP, where he held leadership positions in North and South America, Africa and Europe, and most recently as Regional CFO for Brazil, Uruguay, Colombia and Venezuela. Mr. Caballero holds a law degree from Universidad de los Andes (Bogotá), an MBA in energy business from Fundação Getulio Vargas (Rio de Janeiro) and has completed executive programs in advanced financial management from Duke University and the Wharton School of Business.

Management Team

Jorge Elman Osorio Franco has served as the Development and Production Vice-President of Ecopetrol since March 1, 2019. Prior to his current assignment, he served as Regional Development and Production Vice-President from June 2017 to February 2019. He holds a degree in chemical engineering from the National University of Colombia and has over 31 years of experience in engineering, projects and operations in the oil and gas industry. He spent 24 years of his career at BP, where he served as Operations Manager, Senior Operations Manager in Major Projects, Technical Director and Operations Excellence Director, among other leadership positions including managerial positions in Colombia, Trinidad & Tobago and Indonesia.

Jorge Arturo Calvache Archila has served as Vice-President of Exploration since February 1, 2019. He has more than 35 years of experience. He has served in companies such as Shell and Hocol, where he led exploration projects in the Netherlands, the United States and Colombia. Mr. Calvache holds a degree in geology from Universidad Nacional, post-graduate studies in geophysics from the same university, and studied management at the Universidad de Los Andes.

Jurgen Gerardo Loeber Rojas has served as the Projects & Engineering Vice-President of Ecopetrol since May 2016. Mr. Loeber holds a degree in business administration from the Universidad del Norte and a specialization in project management. He joined the Army Corps of Engineers as reserve officer and reached the rank of captain. He has over 30 years of experience in the oil and gas industry. He began his career in 1985 in Exxon as financial analyst. From 1992 to 2001, he worked for BP in various countries as project manager, construction manager and project control engineer. For the last 10 years, he worked at Equión Limited (formerly BP Exploration Colombia) as Project Director. From 2001 to 2006, he was Project Director for Wood Group Colombia.

Pedro Fernando Manrique Gutierrez has served as the Commercial and Marketing Vice President of Ecopetrol since April 2017. He is also a member of the Cartagena refinery, Cenit and Invercolsa's board of directors. He holds a bachelor's degree in electrical engineering from the Industrial University of Santander, a master's degree in industrial and systems engineering from the University of Florida in the United States where he was a Fulbright Scholar, and an MBA from the IE Business School in Madrid, Spain. He has 30 years of experience in the oil and gas industry and previously spent 15 years in the upstream business with Chevron Petroleum Company in different locations, with his last assignment being as the Commercial and Business Planning Manager for Chevron Latin America, where he also served as a member of the Leadership Team for Chevron Latin America. During his career he has also worked at Enron Energy Services as a Risk Manager and at Enron International as a Business Development Manager, each based in Houston, Texas.

Héctor Manosalva Rojas has served as CEO of Cenit S.A.S., Ecopetrol's midstream subsidiary, since March 1, 2019. He joined Ecopetrol in 1986 and prior to his appointment as CEO of Cenit, he served as Vice-President for Development and Production since July 2014. Over the course of his career at Ecopetrol, Mr. Manosalva has held various positions, including Executive Vice-President for Production and Exploration, Vice-President of Production, Production Manager of the Central Region, President of Colombia's Advisor for Safety and Security of National Energy Infrastructure, Director of HSE and Corporate Social Responsibility, Production Manager of the Southern Region and Head of the Production Planning Division. Mr. Manosalva holds a degree in petroleum engineering from the Universidad de America (Bogotá) and postgraduate degrees in Finance at the Universidad EAFIT and Executive Management at the Universidad de los Andes.

Juan Manuel Rojas Payán has served as Corporate Vice-President for Strategy and Business Development since August 2018. Prior to his appointment, he served as Corporate Manager for New Business since 2016. He graduated with a degree in Economics from Universidad de los Andes and holds a master's degree in Public Policy from Harvard University and a master's degree in Economics from Universidad de los Andes. Previously he was Vice-Minister of Mines and Energy, Chief Executive Officer of Bidas Corporation, Manager of New Business at Pan American Energy, and Director of Energy at Sideco Americana/Socma, among other positions. He has been a member of the boards of directors of different utilities companies in various countries, a petrochemical company, and of oil and gas companies in Latin America. In addition, he worked as a consultant for the energy industry in Asia, Africa and Latin America. In the academic field, he has been professor of the master of public policy program at the University Torcuato di Tella in Argentina and the professor of history of economic thought at the University of the Andes in Colombia.

Yeimy Báez has served as Gas Vice-President since March 2020. In this position, Ms. Báez is responsible for leading, strengthening and executing an integrated strategy to develop natural gas, LPG, biogas and hydrogen, which being clean energy sources are fundamental for energy transition and the Ecopetrol Group's sustainability. She has over 17 years of experience in the oil and gas industry, where she successfully fulfilled a broad range of technical, commercial, strategic and financial roles; including as the Corporate Manager of Financial Planning and Business Performance in Ecopetrol. She holds a degree in Petroleum Engineering from the Industrial University of Santander, an MBA degree from Externado of Colombia University and is highly-skilled in Project Management (PMP certified). Prior to her current assignment, she served for recognized players in the industry such as Equión, BP and Weatherford.

Mauricio Jaramillo Galvis has served as Vice-President of Health, Safety and Environment (HSE) since January 2020. Mr Jaramillo has 26 years of experience in the oil and gas private sector in Colombia and Latin America. He has been appointed to several leadership roles as Vice-President of HSE of BP Colombia, Vice-President of HSE and Engineering at the Andean Unit of BP, Vice-President of Corporate Affairs and HSE, and Vice-President of Human Resources and Sustainability at Equión, among others. Mr. Jaramillo holds an MD from Universidad Javeriana, a specialization in Occupational Health and Safety from Universidad El Bosque and a degree from the Operations Academy at MIT.

Walter Fabián Canova has served as Vice-President of Refining and Industrial Processes since April 16, 2020. Since joining the Ecopetrol Group in March 2017, first as Operations Vice-President and later General Manager for the Cartagena Refinery, Mr Canova has been part of the Ecopetrol transformation process. Mr. Canova has almost 30 years of experience in the public and private oil and gas sector, mainly in refining and logistic with a strong focus on strategy and operations. He holds a degree in Chemical Engineer from Universidad Nacional del Litoral, Argentina, completed post-graduate studies in Project Management and Management Program at North Caroline and Houston Universities, and an MBA at Universidad de Belgrano, in Argentina. Prior to joining Ecopetrol, he has worked in several refineries and headquarters for companies such as ExxonMobil, Axion Energy and Puma Energy, where he held positions such as Operations Manager, Project Manager and General Manager.

Fernán Ignacio Bejarano Arias has served as Vice-President of Legal Affairs and General Counsel at Ecopetrol since March 2016. Mr. Bejarano Arias holds a bachelor's degree in law from Universidad Javeriana in Bogotá and an LLM from American University in Washington D.C. In his more than thirty years of professional experience, he has been a partner at the law firms of Estudios Palacios Lleras S.A, Bejarano Cárdenas y Ospina y Asociados Ltda and OPEBSA Compañía de Abogados S.A.S. and has worked for several years in important positions in the public sector, such as the Vice-Minister of Foreign Affairs, Secretary of the Monetary Board, Secretary of the Board of Directors of the Banco de la República (Colombian Central Bank), Office of Legal Affairs Counselor at the Presidency of the Republic of Colombia, and Vice-President of Legal Affairs and General Counsel at Corporación Financiera Colombiana. Mr. Bejarano Arias is a professor at the Faculty of Law of the Universidad Javeriana, and has been an arbitrator before the Center for Arbitration and Conciliation of the Bogotá Chamber of Commerce.

Mónica Jiménez González has served as Secretary General of Ecopetrol S.A. since July 2016. Monica leads the corporate affairs of the company which includes heading the corporate governance initiatives for Ecopetrol and its group of companies, the company's Corporate Responsibility programs, and Ecopetrol's corporate communications. Ms. Jiménez holds a law degree from University of the Andes (Bogotá) and has practiced as a foreign lawyer in Canada. She worked as a lawyer in a boutique law firm that specialized in international law and then in a major Canadian law firm in Vancouver, BC. Ms. Jimenez has practiced in Colombia and Canada on matters related to corporate social responsibility (ESG), corporate law and international arbitration. She holds a post-graduate degree in Civil and State Responsibility from the Universidad Externado de Colombia and a Master of Science in Development Studies from the London School of Economics and Political Science. She has extensive experience as counsel and tribunal secretary in commercial and investment arbitrations under the rules of the ICC, ICSID and UNCITRAL. Ms. Jimenez is also a Member of the International Court of Arbitration of the International Chamber of Commerce (ICC).

María Juliana Alban Durán has served as Compliance Vice-President and Compliance Officer since July 2015. Ms. Alban holds a law degree from Universidad Sergio Arboleda with a specialization in commercial and financial Law from the same institution and has completed an executive program in strategic management of regulatory and enforcement agencies at Harvard's Kennedy School of Government. Beginning in 2007, Ms. Alban previously worked in the Attorney General's Office (Procuraduría General de la Nación) as Attorney General for State Contracts, General Secretary and Chief of Legal Office, among other positions within the institution.

Alejandro Arango Lopez has served as Vice-President of Human Resources at Ecopetrol S.A. since October 2014. He has more than 20 years of professional experience in different countries and has worked as Vice-President of Human Resources at Banco Santander in Colombia and as Human Resources Director of the Consumer Finance Division, Strategy Division and Cards Division at Banco Santander in Spain. Mr. Arango has also served as Human Resources Director for the Asia Pacific region at Banco Santander in Hong Kong and as Global Human Resources Division T&O, among others. Mr. Arango holds a degree in strategic marketing from CESA School of Business, a bachelor's degree in theology from the Universidad Hochschule Sankt Georgen (Frankfurt) and a bachelor's degree in philosophy from Javeriana University.

Andrés Eduardo Mantilla Zarate has served as the Director of the Colombian Petroleum Institute of Ecopetrol (ICP), the technology development and innovation center of the company, since September 2013. He holds a degree in Petroleum Engineering from Universidad Industrial de Santander, Colombia, a Master of Science degree in Petroleum Engineering from Stanford University, and a Ph.D. in Geophysics from Stanford University. His professional work includes the leadership and management of the teams for development, demonstration and implementation of energy and environmental technologies. In the last three years, he has reoriented the ICP efforts towards the exploration and development of technological solutions to take advantage of the energy transition, adapt and mitigate climate change, protect and strengthen biodiversity, and the protection and responsible use of water. He had previously worked for Ecopetrol holding various positions between 1994 and 2006. Before rejoining Ecopetrol in 2013, he worked for BP Colombia, Marathon Oil Company and Maersk Oil. During his professional career, he has had exposure to exploration and production projects and the evaluation of new ventures in Colombia, the Gulf of Mexico, the North Sea, West Africa, South America and the Middle East.

Diana Escobar Hoyos has served as Vice-President of Sustainable Development since September 2020. Ms. Escobar is a lawyer from Universidad Pontificia Bolivariana who specialized in Human Rights and International Humanitarian Law at University of Antioquia, with complementary studies in sustainable development and renewable energy. Ms. Escobar has worked as Deputy Commissioner for Legality and Coexistence in the Office of High Commissioner for Peace at Presidency of the Republic, coordinator of programs for economic reintegration of population in social risk in the Mayor's Office of Medellín, consultant in sustainable development for sectors such as agricultural and retail, resource manager in non-governmental entities and external consultant at the Inter-American Development Bank.

Carlos Andrés Santos Nieto has served as Vice-President of Supply and Services since July 23, 2018. Prior to his appointment as Vice-President of Supply and Services, he was Procurement and Supply Chain Manager at Ecopetrol. Mr. Santos is an economist from Universidad Externado de Colombia and holds a postgraduate degree in international economics from the same institution and a college diploma course in advanced negotiations from Universidad CESA, and has completed other negotiations training provided by BP in Colombia, Alaska and London. Prior to joining the Company, he served as Offshore Business Unit General Manager in Coremar Group and Procurement & Supply Chain Manager Drilling, Wells, Subsurface and Offshore in Equión Energía Limited (Former BP Exploration Colombia). He also served as Latin America Procurement Sourcing Manager for Merck Sharp & Dohme and Procurement & Supply Chain Manager Specialist for Quila Colombia S.A. He has held various positions within BP as PSCM Drilling & Wells Category Lead, Iraq SPU in London, PSCM Market Intelligence Lead & Deflation Project Lead in Alaska, PSCM Specialist D&W in Alaska, PSCM Specialist O&M in Colombia, PSCM Commercial Analyst in Colombia and PSCM Specialist Business Support in Colombia.

Ernesto Gutiérrez de Piñeres has served as Digital Vice-President since October 2018. Mr. Gutierrez de Piñeres is a Systems Engineer and Information Systems Management Specialist from University of Norte de Barranquilla, and holds an Executive MBA from Los Andes University. He has more than 19 years of experience as Director and Manager (CIO) of information technology areas in different multinational companies on multiple industry sectors, leading and developing high performance teams in Colombia, USA, Central and South America. Mr. Gutierrez de Piñeres is an executive with experience in transforming technology areas into business partners and generators of value for the organizations through technology-based innovation, team development and technology strategies that leverage corporate strategy and competitive business.

None of our Directors, Executive Officers or members of senior management has any familial relationship with any Director, Executive Officer or member of senior management.

7.6 *Compensation of Directors and Management*

Based on a resolution adopted at our annual shareholders' meeting in 2012, compensation for Directors' attendance in person at meetings of the Board of Directors and/or committee meetings increased from the equivalent of four to six minimum monthly wage salaries, which totals approximately COP\$5.4 million for 2021 and COP\$5.2 million for 2020. See Note 31.1 to our consolidated financial statements for more details.

During 2020, the total compensation paid to our Directors, executive officers and senior management active amounted to COP\$24.07 billion. This includes amounts paid to certain of our Directors, executive officers and senior management pursuant to a bonus plan under which such persons are entitled to receive contingent compensation based on our company results for each full year. The contingent compensation ranges from 0% to 150% of each person's base compensation based on our company performance.

None of the members of our management team are eligible to receive pension and retirement benefits from us. The total amount recorded as of December 31, 2020 to provide pension and retirement benefits amounted to COP\$13,413 million.

7.7 Share Ownership of Directors and Executive Officers

No individual Director or executive officer beneficially owns more than 1% of our outstanding shares.

The following executive officers own shares of Ecopetrol:

Table 65 – Executive Officers owning Ecopetrol's shares

Executive Officer	Number of shares⁽¹⁾	% Ownership
Felipe Bayón Pardo	8,418	0.00002%
Jaime Eduardo Caballero Uribe	30,000	0.00007%
Cecilia María Vélez White	59,833	0.00015%

(1) As of March 31, 2021.

Under Colombian law, all of our shareholders have the same economic privileges and voting rights.

7.8 Controls and Procedures

Disclosure Controls and Procedures

As required by Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as of December 31, 2020, we evaluated the design and effectiveness of our financial disclosure controls and procedures under the supervision and participation of our management, including our Chief Executive Officer and Chief Financial Officer. There are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, even if effective, disclosure controls and procedures can only provide reasonable assurance of achieving their control objectives.

Based upon this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that as of the end of the period covered by this annual report, our disclosure controls and procedures were effective to provide reasonable assurance that the information required to be disclosed in the reports that we file and submit under the Securities Exchange Act of 1934 is recorded, summarized and reported as and when required and is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15(d)-15(f) under the Securities Exchange Act of 1934. Our internal control over financial reporting is a process designed under the supervision of our Chief Executive Officer and Chief Financial Officer, and monitored by our board of directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our financial statements for external reporting purposes in accordance with generally accepted accounting principles, and it includes those policies and procedures that: i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect transactions and dispositions of our assets; ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures are being made only in accordance with authorization of our management and directors; and iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Therefore, effective control over financial reporting cannot, and does not, provide absolute assurance of achieving our control objectives. Also, projection of any evaluation of the effectiveness of the internal controls to future periods is subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

As of the year ended December 31, 2020, our management conducted an assessment of the effectiveness of our internal control over financial reporting in accordance with the criteria established in the publication "Internal Control – Integrated Framework (2013)," issued by the Committee of the Sponsoring Organizations of the Treadway Commission, as well as the rules set by the SEC in its Final Rule "Management's Report on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports."

Based on the assessment performed, management concluded that our internal control over financial reporting was effective as of the end of the period covered by this annual report.

The effectiveness of our internal control over financial reporting has been audited by Ernst & Young Audit S.A.S., an independent registered public accounting firm, as stated in their audit report accompanying our consolidated financial statements.

Audit and Non-Audit Fees

Our consolidated financial statements for the fiscal years ended December 31, 2020, 2019 and 2018 were audited by Ernst & Young Audit S.A.S. The following table sets forth the fees billed to us by Ernst & Young Audit S.A.S. during the fiscal years ended December 31, 2020 and December 31, 2019.

Table 66 – Fees Billed to us by Ernst & Young Audit S.A.S.

COP Millions, excluding 19% Value Added Tax	For the year ended December 31,	
	2020	2019
Audit fees	12,864	10,343
Audit-related fees	-	-
Tax fees	-	-
All other fees	-	-
Total	12,864	10,343

Audit Fees. The audit fees listed in the table above are the aggregated fees billed by Ernst & Young Audit S.A.S. in connection with their audits of our annual consolidated financial statements (IFRS), interim consolidated financial statements (under IFRS), statutory audits of Ecopetrol S.A. and its consolidated subsidiaries and some of its associate entities (under local GAAP) and review of periodic documents filed with the SEC. In addition, these audit fees include fees related to our independent auditors' audits of our internal controls over financial reporting.

Changes in Internal Control over Financial Reporting

There were no changes made in our internal control over financial reporting during the year ended December 31, 2020 that have materially affected or are reasonably likely to materially affect the Company's internal controls over financial reporting.

Attestation Report of the Registered Public Accounting Firm

Ernst & Young Audit S.A.S.'s attestation report on our internal control over financial reporting is included in their audit report accompanying our consolidated financial statements. See *Report of Independent Registered Public Accounting Firm* to the consolidated financial statements.

Significant Changes

For a description of significant events since December 31, 2020, please see Note 34 to our consolidated financial statements.

8. Financial Statements

Ecopetrol S.A.

Consolidated Financial Statements

At December 31, 2020 and 2019 and for three years ended December 31, 2020, 2019 and 2018

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Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Ecopetrol S.A.

Opinion on the Financial Statements

We have audited the accompanying consolidated statements of financial position of Ecopetrol S.A. (the Company) as of December 31, 2020 and 2019, the related consolidated statements of profit or loss, comprehensive income, changes in equity, and cash flows for each of the three years in the period ended December 31, 2020, and the related notes and financial statement schedules listed in exhibits 1 and 2 (collectively referred to as the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2020, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated April 8, 2021 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Estimation of fair value amount of long-lived assets in the Cartagena refinery

*Description of
the Matter*

As described in notes 4.12 and 18 of the consolidated financial statements, management assesses, at each reporting date, whether there is an indication that long-lived assets may be impaired. If any indication exists, or when annual impairment testing for an asset is required, management estimates the asset's recoverable amount. An asset's recoverable amount is the higher of an asset's or Cash Generating Unit (CGU's) fair value less costs of disposal and its value in use. When the carrying amount of an asset or CGU exceeds its recoverable amount, the asset is considered impaired and is written down to its recoverable amount. A previously recognized impairment loss is reversed only if there has been a change in the assumptions used to determine the asset's or CGU's recoverable amount since the last impairment loss was recognized. In 2020, the Company recognized an impairment charge in the Cartagena refinery of COP \$ 418,803.

Auditing management's estimate related to the determination of the assets' or CGU's recoverable amount was complex and required the involvement of specialists due to the highly judgmental nature of the assumptions used in the model for estimating the asset's recoverable amount. In particular, the estimation to determine the recoverable amount was sensitive to significant assumptions, such as changes in the weighted average cost of capital, sales price of refined products, refining margins and the level of operational expenditures, which are affected by expectations about future market or economic conditions.

*How We Addressed the Matter in
Our Audit*

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the Company's process to determine the recoverable amount of the CGUs, including controls over management's review of the significant assumptions described above, projected financial information and methodology used to develop such estimates.

Our audit procedures included, among others, assessing methodologies and testing the significant assumptions described above and the underlying data used by the Company by comparing the significant assumptions used by management to current industry and economic trends. Additionally, we assessed the reasonableness of the Company's projections by comparing them to actual results and internal business plans, and also tested the clerical accuracy of such projections.

We also involved our valuation specialists to assist us in the review of the weighted average cost of capital and projected financial information used in management's estimate and to perform a sensitivity analysis to evaluate the change in the recoverable amount that would result from changes in the underlying assumptions.

Furthermore, we evaluated the disclosure of this matter in Note 18 to the consolidated financial statements.

Determination of depreciation, depletion and amortization and impairment of long-lived assets

Description of the Matter

As described in notes 3.1 and 3.2 to the consolidated financial statements, the computation of the units-of-production method, which is used in the determination of depreciation, depletion and amortization (DD&A) of property, plant and equipment related to exploration and production and natural and environmental resources, as well as in the determination of future cash flows used in the impairment analysis of long-lived assets, is dependent upon the estimation related to oil and gas reserves.

The estimation of oil and gas reserves used to calculate the DD&A and perform the impairment analysis is a complex process and requires professional judgement. Management uses external independent engineers (hereinafter “specialists”) when estimating the reserves, which are determined based on geological, technical and economic factors. Estimates of oil and gas reserves depend upon a number of variable factors and key assumptions, including, quantities of oil and gas that are expected to be recovered, the timing of the recovery, production levels, operating and capital costs to be incurred, sales price, among others.

Auditing the Company’s DD&A and impairment calculation was complex, because of the inherent technical engineering nature of the reserves estimation process, which requires the use of specialists in the performance of the assessment, including in the determining the reasonableness of management’s key assumptions previously identified.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the Company’s process to calculate the DD&A and to perform its impairment analysis, including management’s controls over the completeness and the accuracy of the financial data provided to the specialists for use in estimating oil and gas reserves and methodology used to develop such estimates.

To evaluate the estimated quantity of oil and gas reserves expected to be recovered used to calculate the DD&A and in the impairment calculation, we obtained the reports from external specialists hired by management and evaluated the competency and objectivity of the external specialists and management’s qualified persons responsible for overseeing the preparation of the reserve estimates by the specialists through the consideration of their professional qualifications, experience and their use of accepted industry practices.

In addition, we evaluated the completeness and accuracy of the financial data and inputs described above, which were used by the specialists in estimating oil and gas reserves by agreeing them to the DD&A and cash flows used in impairment analysis. For proved undeveloped reserves, we evaluated management’s development plan for compliance with the SEC rule that undrilled locations are scheduled to be drilled within five years, unless specific circumstances justify a longer time, by assessing consistency of the development projections with the Company’s drill plan and the availability of capital relative to the drill plan. We also tested the mathematical accuracy of the DD&A computations and reviewed the model of impairment analysis of long-lived assets by assessing the consistency between the estimation of oil and gas reserves prepared by the specialists with volumes of reserves included in the projected financial information, among other procedures.

Furthermore, we evaluated the disclosure of this matter in Notes 35.4 and 35.5 to the consolidated financial statements.

Recoverability of deferred tax assets

Description of the Matter

As described in notes 4.14.2 and 10.2 to the consolidated financial statements, on December 31, 2020, the Company had deferred tax assets arising from net operating losses carryforwards (NOLs) of approximately COP \$ 7,673,912. The NOLs were generated primarily by Ecopetrol USA Inc. and Refinería de Cartagena S.A.S. Deferred tax assets are subject to review at the end of each reporting period, and are reduced to their realizable amounts, to the extent it is no longer probable that sufficient taxable profit will be realized in the future.

Auditing management's assessment of the realizability of deferred tax assets involved complex auditor judgment because management's estimate of realizability is based on assessing the probability, timing and sufficiency of future taxable profits, expected reversals of taxable temporary differences and available tax planning opportunities that will create future taxable profits; these projections are sensitive because they can be affected by variabilities in management's projections and future market and economic conditions.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the Company's process to determine the realizability of deferred tax assets, including controls over management's projections of future taxable income, scheduled analysis of the future reversal of existing taxable temporary differences and the identification of available tax planning opportunities.

Among other audit procedures performed, we involved our valuation and tax professionals to assist on the review of significant assumptions used in the projections of future taxable income by jurisdiction. We also tested the completeness and accuracy of the underlying data used in such projections. We evaluated the reasonableness of such projections by comparing future taxable income to actual results obtained in prior periods, as well as evaluating management's consideration of current industry and economic trends and evaluating whether changes to the Company's business model and other factors would significantly affect the projected financial information.

In addition, with the assistance of our tax professionals, we assessed the application of the tax laws, including the Company's future tax planning opportunities and tested the Company's scheduling of the timing and amount of reversal of taxable temporary differences.

We also evaluated the related disclosures in the consolidated financial statements.

/s/ Ernst & Young Audit S.A.S.
We have served as the Company's auditor since 2016.
Bogota, Colombia
April 8, 2021

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Ecopetrol S.A.

Opinion on Internal Control over Financial Reporting

We have audited Ecopetrol S.A.' internal control over financial reporting as of December 31, 2020, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), (the COSO criteria). In our opinion, Ecopetrol S.A. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated statements of financial position of the Company as of December 31, 2020 and 2019, the related consolidated statements of profit or loss, comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2020, and the related notes and financial statement schedules listed in exhibits 1 and 2 and our report dated April 8, 2021 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young Audit S.A.S.
Bogotá, Colombia
April 8, 2021

Ecopetrol S.A.

Consolidated statement of financial position
(In millions of Colombian pesos)

		As of December 31,	
	Note	2020	2019
Assets			
Current assets			
Cash and cash equivalents	6	5,082,308	7,075,758
Trade and other receivables, net	7	4,819,092	5,700,334
Inventories, net	8	5,053,960	5,658,099
Other financial assets	9	2,194,651	1,624,018
Current tax assets	10	3,976,295	1,518,807
Other assets	11	1,664,036	1,778,978
		<u>22,790,342</u>	<u>23,355,994</u>
Assets held for sale		44,032	8,467
Total current assets		<u>22,834,374</u>	<u>23,364,461</u>
Non-current assets			
Investment in associates and joint ventures	13	3,174,628	3,245,072
Trade and other receivables, net	7	676,607	786,796
Property, plant and equipment	14	66,508,338	64,214,822
Natural and environmental resources	15	31,934,159	29,072,798
Right-of-use assets	16	377,886	456,225
Intangible assets	17	555,043	483,098
Non-current tax assets	10	8,071,733	6,809,347
Other financial assets	9	877,008	3,355,274
Goodwill	19	1,594,279	1,159,922
Other assets	11	1,090,114	942,481
Total non-current assets		<u>114,859,795</u>	<u>110,525,835</u>
Total assets		<u>137,694,169</u>	<u>133,890,296</u>
Liabilities			
Current liabilities			
Loans and borrowings	20	4,923,346	5,012,173
Trade and other payables	21	8,449,041	10,689,246
Provisions for employee benefits	22	2,022,137	1,929,087
Current tax liabilities	10	1,243,883	2,570,779
Accrued liabilities and provisions	23	1,221,109	789,297
Other liabilities		391,771	751,717
		<u>18,251,287</u>	<u>21,742,299</u>
Liabilities related to non-current assets held for sale		31,156	-
Total current liabilities		<u>18,282,443</u>	<u>21,742,299</u>
Non-current liabilities			
Loans and borrowings	20	41,808,408	33,226,966
Trade and other payables	21	21,064	24,445
Provisions for employee benefits	22	10,401,530	9,551,977
Non current tax liabilities	10	1,866,054	1,399,374
Accrued liabilities and provisions	23	11,206,621	9,128,991
Other liabilities		608,686	584,616
Total non-current liabilities		<u>65,912,363</u>	<u>53,916,369</u>
Total liabilities		<u>84,194,806</u>	<u>75,658,668</u>
Equity			
Subscribed and paid in capital	24.1	25,040,067	25,040,067
Additional paid in capital	24.2	6,607,699	6,607,699
Reserves	24.3	9,635,136	3,784,658
Other comprehensive income	24.5	7,947,062	6,646,660
Retained earnings		669,900	12,334,706
Equity attributable to owners of parent		<u>49,899,864</u>	<u>54,413,790</u>
Non-controlling interest		3,599,499	3,817,838
Total equity		<u>53,499,363</u>	<u>58,231,628</u>
Total liabilities and equity		<u>137,694,169</u>	<u>133,890,296</u>

Ecopetrol S.A.

Consolidated statement of profit or loss

(In millions of Colombian pesos, except for basic and diluted earnings per share, which are expressed in Colombian pesos)

	Note	For the years ended December 31,		
		2020	2019	2018
Sales revenue	25	50,223,393	71,488,512	68,603,872
Cost of sales	26	(37,567,472)	(44,972,360)	(41,184,379)
Gross profit		12,655,921	26,516,152	27,419,493
Administrative expenses	27	(3,373,150)	(2,151,599)	(1,653,858)
Operations and project expenses	27	(2,586,016)	(2,631,754)	(2,903,132)
Impairment loss of non-current assets, net	18	(633,156)	(1,762,437)	(368,634)
Other operating income (expenses), net	28	1,118,166	1,056,796	(35,455)
Operating income		7,181,765	21,027,158	22,458,414
Financial results, net	29			
Finance income		1,101,430	1,623,336	1,129,563
Finance expenses		(3,929,791)	(3,334,469)	(3,512,161)
Foreign exchange gain, net		346,774	40,639	372,223
		(2,481,587)	(1,670,494)	(2,010,375)
Share of profits of associates and joint ventures	13	76,336	366,904	165,836
Profit before income tax expense		4,776,514	19,723,568	20,613,875
Income tax expense	10	(2,038,661)	(4,718,413)	(8,258,485)
Net profit for the year		2,737,853	15,005,155	12,355,390
Net profit attributable to:				
Owners of parent		1,586,677	13,744,011	11,381,386
Non-controlling interest		1,151,176	1,261,144	974,004
		2,737,853	15,005,155	12,355,390
Basic and diluted earnings per share	24.6	38.6	334.3	276.8

Ecopetrol S.A.

Consolidated statement of comprehensive income

(In millions of Colombian pesos)

	Note	For the years ended December 31,		
		2020	2019	2018
Net profit for the year				
Other comprehensive income		2,737,853	15,005,155	12,355,390
Other comprehensive income that may be reclassified to profit or loss in subsequent periods -net of taxes:				
Unrealized gain (loss) on hedges:				
Cash flow hedge for future exports	30.3	(722)	238,331	(533,374)
Hedge of a net investment in a foreign operation	30.4	(364,343)	(61,267)	(971,954)
Cash flow hedge with derivative instruments		55,072	46,451	(52,174)
Foreign currency translation		1,569,996	8,701	2,599,242
		1,260,003	232,216	1,041,740
Other comprehensive income that will not to be reclassified to profit or loss in subsequent periods -net of taxes:				
Remeasurement gain (loss) on defined benefit plans	22.1	96,221	(1,799,829)	(4,290)
Other losses		-	(175,494)	-
		96,221	(1,975,323)	(4,290)
Other comprehensive income (loss) for the year, net of tax		1,356,224	(1,743,107)	1,037,450
Total comprehensive income for the year, net of tax		4,094,077	13,262,048	13,392,840
Comprehensive income attributable to:				
Owners of parent		2,887,080	11,502,149	12,363,132
Non-controlling interest		1,206,997	1,759,899	1,029,708
		4,094,077	13,262,048	13,392,840

Ecopetrol S.A.

Consolidated statement of changes in equity

(In millions of Colombian pesos)

	Note	Attributable to owners of parent					Non-controlling interest	Total equity
		Subscribed and paid-in capital	Additional paid-in capital	Reserves	Other comprehensive income	Retained earnings		
Balance as of December 31, 2019		25,040,067	6,607,699	3,784,658	6,646,660	12,334,706	54,413,790	58,231,628
Net profit		-	-	-	-	1,586,677	1,586,677	2,737,853
Release of reserves		-	-	(540,826)	-	540,826	-	-
Dividends declared	24.4	-	-	-	-	(7,401,005)	(1,425,586)	(8,826,591)
Change in participation in subsidiaries		-	-	-	-	-	249	249
<u>Appropriation of reserves, net:</u>								
Legal		-	-	1,325,148	-	(1,325,148)	-	-
Fiscal and statutory reserves		-	-	509,082	-	(509,082)	-	-
Occasional		-	-	4,557,074	-	(4,557,074)	-	-
<u>Other comprehensive income:</u>								
(Loss) gain on hedging instruments:								
Cash flow hedge for future exports		-	-	-	(722)	-	-	(722)
Hedge of a net investment in a foreign operation		-	-	-	(364,343)	-	-	(364,343)
Cash flow hedge with derivative instruments		-	-	-	40,443	-	14,629	55,072
Foreign currency translation		-	-	-	1,528,803	-	41,193	1,569,996
Remeasurement loss on defined benefit plans		-	-	-	96,221	-	-	96,221
Balance as of December 31, 2020		25,040,067	6,607,699	9,635,136	7,947,062	669,900	3,599,499	53,499,363

	Note	Attributable to owners of parent					Non-controlling interest	Total equity
		Subscribed and paid-in capital	Additional paid-in capital	Reserves	Other comprehensive income	Retained earnings		
Balance as of December 31, 2018		25,040,067	6,607,699	5,138,895	8,380,761	9,970,492	1,969,866	57,107,780
Net profit		-	-	-	-	13,744,011	1,261,144	15,005,155
Release of reserves		-	-	(3,050,703)	-	3,050,703	-	-
Dividends declared	23.4	-	-	(3,659,386)	-	(9,251,256)	(1,010,206)	(13,920,848)
Business combination	12	-	-	-	-	-	1,606,390	1,606,390
Other movements		-	-	-	-	176,608	(350)	176,258
<u>Appropriation of reserves, net:</u>	23.3							
Legal		-	-	1,155,640	-	(1,155,640)	-	-
Fiscal and statutory reserves		-	-	509,082	-	(509,082)	-	-
Occasional		-	-	3,691,130	-	(3,691,130)	-	-
<u>Other comprehensive income:</u>								
Gain (loss) on hedging instruments:								
Cash flow hedge for future exports		-	-	-	238,331	-	-	238,331
Hedge of a net investment in a foreign operation		-	-	-	(61,267)	-	-	(61,267)
Cash flow hedge with derivative instruments		-	-	-	34,651	-	11,800	46,451
Foreign currency translation		-	-	-	29,507	-	(20,806)	8,701
Remeasurement loss on defined benefit plans		-	-	-	(1,799,829)	-	-	(1,799,829)
Other movements		-	-	-	(175,494)	-	-	(175,494)
Balance as of December 31, 2019		25,040,067	6,607,699	3,784,658	6,646,660	12,334,706	3,817,838	58,231,628

Ecopetrol S.A.

Consolidated statement of changes in equity

(In millions of Colombian pesos)

	Note	Attributable to owners of parent					Non-controlling interest	Total equity	
		Subscribed and paid-in capital	Additional paid-in capital	Reserves	Other comprehensive income	Retained earnings			Total
Balance as of December 31, 2017		25,040,067	6,607,700	2,177,869	7,399,015	5,210,302	46,434,953	1,780,746	48,215,699
Net profit		—	—	—	—	11,381,386	11,381,386	974,004	12,355,390
Dividends declared	23.4	—	—	—	—	(3,659,386)	(3,659,386)	(840,626)	(4,500,012)
Appropriation of reserves, net		—	—	2,961,026	—	(2,961,026)	—	—	—
Other movements		—	(1)	—	—	(784)	(785)	38	(747)
Other comprehensive income:									
Gain (loss) on hedging instruments:									
Cash flow hedge for future exports		—	—	—	(533,374)	—	(533,374)	—	(533,374)
Hedge of a net investment in a foreign operation		—	—	—	(971,954)	—	(971,954)	—	(971,954)
Cash flow hedge with derivative instruments		—	—	—	(37,904)	—	(37,904)	(14,270)	(52,174)
Foreign currency translation		—	—	—	2,529,268	—	2,529,268	69,974	2,599,242
Remeasurement loss on defined benefit plans		—	—	—	(4,290)	—	(4,290)	—	(4,290)
Balance as of December 31, 2018		25,040,067	6,607,699	5,138,895	8,380,761	9,970,492	55,137,914	1,969,866	57,107,780

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Consolidated statement of cash flows

(In millions of Colombian pesos)

		For the years ended December 31,		
	Note	2020	2019	2018
Cash flow provided by operating activities:				
Net profit for the period		2,737,853	15,005,155	12,355,390
Adjustments to reconcile the net profit to net cash provided by operating activities:				
Income tax expense	10	2,038,661	4,718,413	8,258,485
Depreciation, depletion and amortization	14,15,16,17	9,324,538	8,582,783	7,704,850
Foreign exchange income	29	(346,774)	(40,639)	(372,223)
Finance cost of loans and borrowings	29	2,384,342	1,894,490	2,399,414
Finance cost of post-employment benefits and abandonment costs	29	872,987	757,509	668,782
Write off of exploratory assets and dry wells	15	448,132	340,271	898,924
Loss on disposal of non-current assets		246,317	121,121	75,835
Gain on revaluation of assets in Guajira association	28	(1,284,372)	-	-
(Gain) loss on acquisition of participations and interests	28	(86,026)	(1,048,924)	12,065
Gain on loss of control	28	(65,695)	-	-
Impairment loss of short-term assets	28	34,416	90,441	136,044
Impairment loss of non-current assets	18	633,156	1,762,437	368,634
(Gain) loss on fair value adjustment of financial assets		(43,948)	18,551	(92,906)
Share of profit of associates and joint ventures	13	(76,336)	(366,904)	(165,836)
Net gain on the sale of assets held for sale		(5,635)	(2,846)	-
Hedge ineffectiveness	30.3	9,779	5,173	35,239
Realized loss (gain) on foreign exchange cash flow hedges	25	193,374	386,773	(128,404)
Net change in operational assets and liabilities:				
Trade and other receivables		678,349	2,381,905	(2,039,161)
Inventories		716,077	(597,552)	(448,135)
Trade and other payables		(2,550,411)	1,389,064	1,355,175
Tax assets and liabilities		(1,256,889)	(1,409,334)	(1,413,915)
Provisions for employee benefits		465,062	(234,629)	(181,060)
Provisions and contingencies		(30,185)	(253,043)	(89,345)
Other assets and liabilities		(392,843)	(492,745)	(218,542)
		14,643,929	33,007,470	29,119,310
Income tax paid		(5,457,225)	(5,295,703)	(6,650,116)
Net cash provided by operating activities		9,186,704	27,711,767	22,469,194
Cash flow used in investing activities:				
Investment in property, plant and equipment	14	(5,032,317)	(4,012,659)	(3,302,929)
Investment in natural and environmental resources	15	(5,994,462)	(9,798,193)	(5,051,828)
Acquisitions of intangibles	17	(90,082)	(168,289)	(105,669)
Sales (purchases) of other financial asset, net		2,107,856	3,117,549	(843,612)
Interests received	29	299,246	481,674	383,624
Dividends received	13	157,241	189,169	108,991
Proceeds from sales of assets		23,713	154,780	92,620
Net cash used in investment activities		(8,528,805)	(10,035,969)	(8,718,803)
Cash flow used in financing activities:				
Proceeds from borrowings	20	13,805,403	359,876	517,747
Repayment of borrowings		(5,003,885)	(1,596,630)	(9,270,262)
Interest payments		(2,345,683)	(1,766,223)	(2,610,562)
Lease payments	16	(350,539)	(300,326)	-
Dividends paid	21	(8,734,351)	(13,867,029)	(4,427,701)
Net cash used in financing activities		(2,629,055)	(17,170,332)	(15,790,778)
Exchange difference in cash and cash equivalents		(22,294)	258,548	406,246
Net (decrease) increase in cash and cash equivalents		(1,993,450)	764,014	(1,634,141)
Cash and cash equivalents at the beginning of the year		7,075,758	6,311,744	7,945,885
Cash and cash equivalent at the end of the year	6	5,082,308	7,075,758	6,311,744

1. Reporting entity

Ecopetrol S.A. (“Ecopetrol”) is a mixed economy company, of a commercial nature, incorporated in 1948 in Bogotá – Colombia, and the parent company of the Ecopetrol Business Group. Its corporate purpose is to conduct commercial or industrial activities related to the exploration, exploitation, production, refining, transportation, storage, distribution and commercialization of hydrocarbons and their derivatives and products, directly or through its subsidiaries (collectively referred to as “Ecopetrol Business Group”).

11.51% of Ecopetrol shares are publicly traded on the New York and Colombian Stock Exchanges. The remaining shares (88.49% of total outstanding shares) are owned by the Colombian Ministry of Finance and Public Credit.

The address of the main office of Ecopetrol is Bogotá – Colombia, Carrera 13 No. 36 – 24.

2. Basis for presentation

2.1 Statement of compliance and authorization of financial statements

The consolidated financial statements of Ecopetrol and its subsidiaries as of December 31, 2020 and 2019 and for the years ended December 31, 2020, 2019 and 2018 have been prepared in accordance with International Financial Reporting Standards (IFRS), as issued by the International Accounting Standards Board (IASB).

Accounting policies described in Note 4 have been applied consistently in all years presented.

These consolidated financial statements were approved and authorized for issuance by the Board of Directors of Ecopetrol on April 8, 2021.

2.2 Basis for consolidation

The consolidated financial statements were prepared by consolidating all companies set out in Exhibit 1, which are those over which Ecopetrol exercises direct or indirect control. Control is achieved when the Ecopetrol Business Group:

- has power over the investee (including rights to manage relevant activities);
- is exposed, or has the rights, to variable returns from its involvement with the investee; and
- has the ability to use its power to affect its operational returns. This instance occurs when the Ecopetrol Business Group has less than a majority of the voting rights of an investee, and it still has the power over the investee to provide it with the practical ability to direct the relevant activities of the investee unilaterally. The Ecopetrol Business Group considers all relevant facts and circumstances in assessing whether or not the Company’s voting rights in an investee are sufficient or not to give it power, including:
 - a) the percentage of the Ecopetrol Business Group’s voting rights relative to the size and apportionment of the shares of other vote holders;
 - b) potential voting rights held by the Ecopetrol Business Group, other vote holders or other parties;
 - c) rights arising from other contractual arrangements; and
 - d) any additional facts and circumstances that indicate that the Ecopetrol Business Group has, or does not have, the current ability to direct the relevant activities, at the time that decisions need to be made, including voting patterns at previous shareholders’ meetings.

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Subsidiaries are consolidated from the date on which control is obtained until the date that such control ceases.

All inter-company assets and liabilities, equity, income, expenses and cash flows relating to transactions between entities of the Ecopetrol Business Group were eliminated on consolidation. Unrealized losses are also eliminated. Non-controlling interest represents the proportion of profit, other comprehensive income and net assets in subsidiaries that are not attributable to Ecopetrol shareholders.

The following subsidiaries had changes in the Group:

2020

- a) The liquidating agency for ECP Oil and Gas Germany GmbH submitted the report and the liquidation balance on December 11, 2020. Therefore, the company is no longer part of the Group from the date above on.
- b) On June 24, 2020, the Superintendence of Companies issued the liquidation orders decreeing on the termination of the reorganization process and the opening of the judicial liquidation process of Bioenergy SAS and Bioenergy Zona Franca SAS. The latter process will be carried out according to the law on business insolvency – Act 1116/2006, and under the direction of the aforementioned Superintendence. As a consequence, as of this date the Group does not have control over these companies and they are no longer part of the consolidated figures. As a result, reduction of net assets was recognized due to the loss of control with an impact on the results of the Business Group for COP\$65,570. The Group does not recognize additional liabilities related to these companies. See Note 28.

2019

- a) In November 2019, Ecopetrol obtained an additional 8.53% ownership interest in Invercolsa, through the Supreme Court of Justice final ruling stating that Mr. Fernando Londoño's attempt to acquire Invercolsa's shares owned by Ecopetrol S.A. was not valid. As a result, Ecopetrol obtained control of Invercolsa, with a total ownership interest of 51.88%. No consideration was paid for the shares obtained as a result of the judicial ruling.

The subsidiaries that started being consolidated as a result of obtaining control of Invercolsa are as follows:

- Inversiones de Gases de Colombia S.A., whose main corporate purpose is to hold investments in companies associated with activities in the energy sector; the exploration, exploitation, refining, transformation, transport, distribution and sale of hydrocarbons and their derivatives in the national territory; and to encourage the establishment of new companies and to hold shares or corporate interests therein.
- Alcanos de Colombia S.A. E.S.P., whose main corporate purpose is to provide fuel gas to homes in Neiva and throughout Colombia; to construct and operate gas pipelines, distribution networks, regulation, measurement and compressor stations and any works undertaken necessary for the management and commercialization of public services.
- Metrogas de Colombia S.A. E.S.P., whose main corporate purpose is to commercialize and distribute fuel gas; to explore, store, use, transport, refine, purchase, sell and distribute hydrocarbons and their derivatives in all their forms and representations.
- Gases del Oriente S.A. E.S.P., whose main corporate purpose is to provide fuel gas to homes by distributing gas and performing all activities complementary to the provision thereof.
- Promotora de Gases del Sur S.A. E.S.P., whose main corporate purpose is to promote the affiliation of national or foreign capital, public or private and to achieve the gas massification project in the Huila department, through a gas pipeline from the Neiva municipality to the Hobo municipality.
- Gasoducto de Oriente S.A., whose main corporate purpose is to design and construct hydrocarbon production and treatment plants, such as gas pipelines, oil pipelines and others, as well as to invest in projects related thereto.
- Combustibles Líquidos de Colombia S.A. E.S.P., whose main corporate purpose is to commercialize wholesale fuel gas, to distribute LPG to homes and to carry out complementary activities to this distribution, as well as to store, transport, package, distribute and sell LPG.

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- b) In July 2019, two companies were incorporated to enable the operation between Ecopetrol S.A. and Occidental Petroleum Corp. (OXY), whereby it was agreed to form a Joint Operation to execute a joint plan for the development of Unconventional Deposits in the Texas Permian Basin. The two companies incorporated were the following:
- Ecopetrol USA Inc., whose corporate purpose is to participate in any lawful act or activity for which corporations may be organized under the General Corporation Law of Delaware.
 - Ecopetrol Permian LLC., whose corporate purpose is to carry out any or all lawful businesses for which limited liability companies can be organized in accordance with the Delaware Limited Liability Companies Act.
- c) Two companies in Mexico were incorporated to provide administrative and technology services to Ecopetrol México. The two companies created were: Topili Servicios Administrativos S. de R.L. de C.V. and Kalixpan Technical Services S. de R.L. de C.V.

2018

- **Ecopetrol Energía S.A.S. E.S.P:** whose corporate purpose is to commercialize electric power for the Ecopetrol Business Group Ecopetrol holds a 99% direct interest in the subsidiary and an indirect interest of the remaining 1% through Andean Chemicals Ltd.

2.3 Basis of presentation

The consolidated financial statements have been prepared on a historical cost basis, except for financial assets and liabilities that are measured at fair value through profit or loss and/or changes in other comprehensive income at the end of each reporting period, as explained in the accounting policies included below.

Historical cost is generally based on fair value of the consideration given in exchange for goods and services.

The fair value is the price that would be received from selling an asset or that would be paid for transferring a liability among market participants, in an orderly transaction, on the date of measurement. When estimating the fair value, the Ecopetrol Business Group uses assumptions that market participants would use for pricing an asset or liability at current market conditions, including risk assumptions.

2.4 Functional and presentation currency

The consolidated financial statements are presented in Colombian Pesos, which is the Ecopetrol's functional currency. For each Ecopetrol Business Group entity, its functional currency is determined based on the main economic environment where it operates.

The statements of profit or loss and cash flows of subsidiaries with functional currencies different from Ecopetrol S.A.'s functional currency are translated at the exchange rates on the dates of the transaction or based on the monthly average exchange rate. Assets and liabilities are translated at the closing rate, and other equity items are translated at exchange rates at the time of the transaction. All resulting exchange differences are recognized in other comprehensive income. On disposal of all or significant part of a foreign operation, the cumulative translation adjustment related to the particular foreign operation is reclassified to profit or loss.

The financial statements are presented in Colombian pesos rounded up to the closest million unit (COP\$000,000) except when otherwise indicated.

2.5 Foreign currency

Transactions in foreign currencies are initially recorded by the Ecopetrol Business Group's entities at their respective functional currency spot rates at the transactions date. Monetary items denominated in foreign currencies are translated at the functional currency spot rates prevailing at the reporting date. Differences arising on settlement or translation of monetary items are recognized in profit or loss, in financial results, net, except those resulting from the conversion of loans and borrowings designated as cash flow hedges or net investment in a foreign operation hedge, which are recognized in other comprehensive income within equity. When the hedged item affects the financial results, exchange differences accumulated in equity are reclassified to profit or loss as part of operating results.

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Non-monetary items measured at fair value that are denominated in a foreign currency are translated using the exchange rates prevailing on the date when the fair value is determined. The gain or loss arising on translation of non-monetary items measured at fair value is treated in line with the recognition of the gain or loss on the change in fair value of the item.

2.6 Classification of assets and liabilities as current and non-current

The Ecopetrol Business Group presents assets and liabilities in the consolidated statement of financial position based on whether assets are classified as current or non-current.

An asset or liability is classified as current when:

- It is expected to be realized or intended to be sold or consumed (or expected to be settled, in the case of liabilities) in the ordinary course of business;
- Held mainly for the purpose of trading;
- Expected to be realized (or to be settled, in the case of liabilities) within twelve months after the reporting period; or
- In the case of the assets, it is cash or a cash equivalent, unless the exchange of such asset or liability is restricted or to be used to settle a liability at least twelve months after the reporting period; or
- In the case of a liability, there is no unconditional right to defer settlement of the liability until at least twelve months after the reporting period.

Other assets and liabilities are classified as non-current.

Deferred tax assets and liabilities are classified as non-current assets and liabilities.

2.7 Earnings per share (basic and diluted)

Basic earnings per share is calculated by dividing the profit for the year attributable to equity holders of Ecopetrol S.A., the parent company, by the weighted average number of ordinary shares outstanding during the year. There is no potential dilution of shares.

2.8 Impact of Covid-19 on financial statements

The Covid-19 outbreak was first reported in late 2019 in China. Subsequently, taking into account the level of expansion, the World Health Organization (WHO) declared the outbreak as a pandemic on March 11, 2020. Said status is maintained to the date of this annual report.

Many countries have undertaken various public health measures to control the spread of COVID-19, including mandatory quarantines, forced economic shutdowns and travel restrictions, as well as economic measures to mitigate the impacts of such public health policies on their respective national economy.

The Covid-19 pandemic has also caused significant volatility in financial and commodity markets around the world. While governments have announced aid packages to the most affected people and taken macroeconomic measures to face the crisis, the COVID-19 pandemic has disrupted economies worldwide.

On March 17, 2020, Colombia Government, through Legislative Decree 417 of 2020, declared a 30 day state of national emergency in light of the health and economic crisis caused by the outbreak of COVID-19. On May 6, 2020, the Government declared a state of emergency for an additional 30 days. For the rest of 2020, the National Government and local authorities implemented sectorized lockdowns, and partial closures of commerce and not essential economic activities according to the number of new cases of infected population and hospital capacity. The Government also has implemented other economic and public health measures to address the crisis, including (i) border closure for all non-citizens and non-residents; (ii) short term and low interest loans for all types of agricultural producers; (iii) payroll subsidies for companies and credit lines for different sectors of the economy; (iv) incentivizing working from home and a mandatory work from home order for 80% of Government employees and (v) reduction in the prices of gasoline, among others.

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This situation has had a significant impact on the oil industry. Most specifically, travel bans imposed by several countries and established quarantine measures reduced demand levels for oil and its derivative products in 2020. Ecopetrol's operations were affected by this situation and as a consequence, some plants in our refineries and some of our wells were temporarily closed due to low demand and prices and the measures taken to contain the spread of COVID-19 in workers and contractors. In this context, Ecopetrol took the following actions during 2020 to face the impacts of the pandemic:

- Ecopetrol's Board of Directors was permanently at the forefront of the crisis caused by Covid-19. Throughout the year, the Board held a total of 15 extraordinary sessions to direct Ecopetrol with opportunity and expeditiousness in taking measures to counteract the impacts derived from this crisis. In addition Ecopetrol issued the 'Declaration of Contingency Operation' in March 2020 and activated the equipment, plans and actions required to prevent infections, respond to new challenges in the operation and special containment measures.
- Cuts in costs and expenses, including austerity measures, prioritization of operational and administrative activities, and control over operational expenses, such as travel restrictions, sponsorships and participation in events, among others.
- Disbursements under credit lines in the aggregate amount of USD\$665 million, as well as an issuance of external public debt bonds in the international capital markets in the aggregate amount of USD\$2 billion. (Note 20).
- Publication of a new organic investment plan for Ecopetrol Group approved by the Board of Directors on July 17, 2020 considering: (i) a detailed review of the Ecopetrol Group's portfolio, (ii) progress in the interventions carried out, and (iii) the gradual recovery of economic activity.
- Allocated resources by COP\$85,387 million in connection with humanitarian aid and other initiatives to strengthen the Colombian health system to address the COVID-19 pandemic.
- The execution by Ecopetrol S.A. of strategic and tactical hedging operations due to its exposure to pricing indices different from the commercialization benchmark and different pricing periods between the buying and the selling of physical barrels of crude oil. A total of 30 million barrels (mmbbls) were the subject of strategic hedges oriented at protecting the Ecopetrol's income and cash flow, limiting losses, covering production costs and avoiding potential closures of production fields. A total of 21.7 million barrels (mmbbls) were the subject of tactical hedges oriented at mitigating risks associated with storage marketing strategies, anticipated purchases of raw materials, supply to refineries, international sales delivered at the destination port and exports of heavy fuel oil.
- Recognition of impairment expenses at the end of December 31, 2020 in the aggregate amount of COP\$633,156 million, after adjusting and updating some of the assumptions used (prices and discount rates) to the circumstances and environment of the 2020, recognizing the impact on the Ecopetrol Group's main long-term assets (some productive assets in the exploration and production segment and in the Refinería de Cartagena). (Note 18 - Impairment of non-current assets).

These measures were aimed at ensuring the sustainability of the Ecopetrol Group's business in an environment of low prices, prioritizing cash-generating opportunities with better equilibrium prices, maintaining growth dynamics with a focus on the execution of strategic asset development plans, and in asset value preservation through investments to gain reliability, integrity and continuity to the current operation in refineries, transportation systems and production fields. Similarly, these actions are covered by Ecopetrol's risk management policies and procedures. (Note 30).

In terms of Ecopetrol's results of operations as of and for the year ended December 31, 2020, the most significant impacts were the following in: (i) a reduction in revenues (Note 25), especially due to the contraction in demand and a decrease in the international Brent price, partially offset with the higher exchange rate, (ii) an increase in financial costs due to an increase in debt (Note 29), a decrease in valuation to fair value and lower yields of the securities portfolio, which in turn were as a result of low market rates, (iii) recognition of impairment at the end of the year as described above (Note 18), and (iv) an increase in our depreciation expenses (Notes 14, 15, 16 and 17), partly generated by the update of the Ecopetrol's reserve balance (Note 35).

As a result of the measures taken, the constant monitoring of the COVID-19 pandemic, the ongoing vaccination programs and the evolution of the Ecopetrol Group's results, while we cannot offer any assurances, as of the date of this annual report, Ecopetrol does not believe that the Covid-19 pandemic will have a significant impact on the Ecopetrol Group in the long-term.

Nonetheless, the Ecopetrol Group will continue to monitor the evolution of the COVID-19 pandemic and the market to determine the need to implement subsequent stages of the COVID-19 intervention plan and will continuously review impairment indicators on long-lived assets and on investments in companies.

2.9 Reclassifications

For presentation purposes, the Group reclassifies some items in the comparative figures as of December 2019. This had no impact on the items in the statements of financial position, profit or loss, comprehensive income, changes in equity or cash flows.

3. Significant estimates and accounting judgments

The preparation of the consolidated financial statements requires management to make judgements, estimates and assumptions that affect the reported amounts of assets, liabilities, sales revenues, costs and commitments recognized in the financial statements and the accompanying disclosures. The Ecopetrol Business Group based its assumptions and estimates on parameters available when these consolidated financial statements were prepared. Uncertainty about these assumptions and estimates could result in outcomes that required a material adjustment to the carrying amount of assets or liabilities affected in future periods. Changes in estimates are adjusted prospectively in the period in which the estimate is revised.

In the process of applying the Ecopetrol Business Group's accounting policies, management has made the following judgments and estimates which have the most significant impact on the amounts recognized in the consolidated financial statements:

3.1 Oil and gas reserves

Hydrocarbon reserves are estimates of the amount of hydrocarbons that can be economically and legally extracted from the Ecopetrol Business Group's oil and gas properties.

The reserves estimation is performed annually as of December 31 in accordance with the United States Securities and Exchange Commission (SEC) definitions and rules set forth in Rule 4-10(a) of SEC Regulation S-X and the disclosure guidelines contained in the SEC final rule – Modernization of Oil and Gas Reporting.

As required by current regulations, the future estimated date on which a field will no longer produce for economic reasons, is based on actual costs and average of crude prices (calculated as the arithmetical average of prices on the first day of the past 12 months). The estimated date for end of production will affect the amount of reserves, unless the prices have been defined by contractual agreements; therefore, if the prices and costs change from one year to the next, the proved reserves estimate also changes. Generally, our proved reserves decrease as prices go down and increase when prices go up.

Reserves estimation is an inherently complex process and it involves professional judgments. Reserves estimations are prepared using geological, technical and economic factors, including projections of future production rates, oil prices, engineering data and duration and amount of future investments, and they imply a certain degree of uncertainty. These estimations reflect the regulatory and market conditions existing on the date of reporting, which could significantly differ from other conditions during the year or in future periods.

Any changes in regulatory and/or market conditions and assumptions could materially affect the reserves estimation.

Impact of oil reserves and natural gas in depreciation and depletion

Changes to estimations for proven developed reserves may affect the carrying amounts of exploration and production assets, natural resources and environment, goodwill, liabilities for dismantling and depreciation, depletion and amortization. With all other variables remaining unchanged, a decrease in estimated proven reserves would increase, prospectively, depreciation, depletion and amortization costs, while an increase in reserves would reduce depreciation and amortization expenses, as depreciation, depletion and amortization charges are calculated using the units of production method.

Information about the carrying amounts of exploration and production assets and the amounts charged to income, including depreciation, depletion and amortization, is presented in Notes 14 and 15.

3.2 Impairment of non-current assets

Management uses its professional judgment in assessing the existence of evidence of an impairment loss or reversal, based on internal and external factors.

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When an indicator of impairment loss or reversal of impairment of prior period impairment exists, the Ecopetrol Business Group estimates the recoverable amount of the cash generating units (CGU), which is considered the greater of fair value less costs of disposal and the value in use.

The assessments require the use of estimates and assumptions, such as, among other factors: (1) estimation of the volumes and market value of oil and natural gas reserves; (2) production profiles for oilfields and the future production of refined and petrochemical products; (3) investments, taxes and future costs; (4) useful life of assets; (5) long-term prices; (6) the discount rate, which is revised annually and determined as the weighted average cost of capital (WACC); and (7) changes in environmental regulation. The recoverable amount is compared to the carrying amount of the asset, thus determining whether the asset is impaired or if the impairment recognized in prior periods should be reversed.

A previously recognized impairment loss is reversed (except over the goodwill), only if there has been a change in the assumptions used to determine the assets or in the CGU's recoverable amount since the last impairment loss was recognized. The reversal is limited so that the carrying amount of an asset or CGU, other than goodwill, does not exceed either its recoverable amount, or the carrying amount that would have been determined (net of amortization or depreciation) had no impairment loss been recognized for the asset or CGU in prior periods.

Future oil price assumptions are estimated at current market conditions related to upstream. Expected production volumes, which comprise proven unproved, probable and possible reserves are used for impairment testing because management believes this to be the most appropriate indicator of expected future cash flows, which would also be considered by market participants. Reserves estimates are inherently imprecise and subject to risk and uncertainty. Furthermore, projections about unproved volumes are based on information that is necessarily less robust than what is available for mature reservoirs.

These estimates and assumptions are subject to risk and uncertainty. Therefore, there is a possibility that changes in circumstances will impact these projections, which may also impact the recoverable amount of assets and/or CGUs, hence, may also affect the recognition of an impairment loss or the reversal of prior period impairment amounts.

3.3 Exploration and evaluation costs

The application of the Ecopetrol Business Group's accounting policy for exploration and evaluation costs requires judgment in order to determine whether future economic benefits are likely, either from future exploitation or sale, or whether activities have not reached a stage which permits a reasonable assessment of the existence of reserves. Certain exploration and evaluation costs are initially capitalized when it is expected that commercially viable reserves will result. The Ecopetrol Business Group uses its professional judgment of future events and circumstances and makes estimates in order to annually assess the generation of future economic benefits for extracting oil resources, as well as technical and commercial analyses to confirm its intention of continuing their development. Changes regarding available information, such as drilling success level or changes in the project's economics, production costs, and investment levels, as well as other factors, may result in capitalized exploration drilling costs being recognized in profit or loss for the period. The expenses for dry wells is included in operating activities in the consolidated statement of cash flows.

3.4 Determination of cash generating units (CGU)

The allocation of assets in cash generating units requires significant judgment, as well as assessments regarding integration among assets, the existence of active markets, and similar exposure to market risk, shared infrastructure, and the way in which management monitors the operations. See Note 4.12 – *Impairment of non-current assets* for more information.

3.5 Abandonment and dismantling costs of fields and other facilities

According to environmental and oil regulations, the Ecopetrol Business Group is required to bear the costs for the abandonment of oil extraction, refining plants and transportation facilities, which include the cost of plugging and abandoning wells, dismantling facilities, and environmental remediation in the affected areas.

Estimated abandonment and dismantling costs are recorded at the time of the installation of the assets and are reviewed annually.

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The calculations for these estimations are complex and involve significant judgments by Management. The ultimate decommissioning costs are uncertain and cost estimates can vary in response to many factors, including changes to relevant legal requirements, the emergence of new restoration techniques or experience at other production sites. The expected timing, extent and amount of expenditure may also change, for example, in response to changes in internal cost projections, changes in reserve estimates, future inflation rates and discount rates. The Ecopetrol Business Group considers that the abandonment and dismantling costs are reasonable, based on the experience of the Ecopetrol Business Group and market conditions; nevertheless, significant variations in external factors used for the calculation of the estimation could significantly impact the amounts recorded in the financial statements. See Note 4.13 - *Provisions and contingent liabilities* (Obligation to withdraw assets).

3.6 Pension plan and other benefits

The determination of expenses, liabilities and adjustments relating to pension plans and other defined retirement benefits makes it necessary for management to use its judgment in the application of actuarial assumptions made in the actuarial calculation. The actuarial assumptions include estimates regarding future mortality, retirement, changes in compensation and discount rate in order to reflect the time value of money, in addition to the rate of return on the plan's assets. Due to the complexity in the valuation of these variables, as well as their long-term nature, the estimated amounts are quite sensitive to any change in these assumptions.

These assumptions are reviewed on an annual basis and may differ materially from actual results due to changes in economic and market conditions, regulatory changes, judicial rulings, higher or lower retirement rates, or longer or shorter life expectancies among employees.

3.7 Goodwill impairment

In December of each year, the Ecopetrol Business Group performs an annual impairment test on goodwill to assess if its carrying amount may be impaired.

The determination of the recoverable amount is described in Note 4.12, and its calculation requires assumptions and estimates. The Ecopetrol Business Group considers that the assumptions and estimations used are reasonable and supportable based on the current market conditions and are aligned to the risk profile of the related assets. However, if different assumptions and estimations are used, they could lead to different results. Valuation models used to determine fair value are sensitive to changes in the underlying assumptions. For example, sales volumes and prices that will be paid for the purchase of raw materials are assumptions that may vary in the future. Adverse changes in any of these assumptions could lead to the recognition of goodwill impairment.

3.8 Litigation

The Ecopetrol Business Group is subject to claims relating to regulatory and arbitration proceedings, tax assessments and other claims arising in the normal course of business. Management evaluates these claims based on their nature, the likelihood that they materialize and the amounts involved, to decide on the amounts recognized and/or disclosed in the financial statements.

This analysis, which may require considerable judgment, includes the assessment of current legal proceedings brought against the Ecopetrol Business Group and claims not yet initiated. A provision is recognized when the Ecopetrol Business Group has a present obligation derived from a past event, it is likely that an outflow of resources of economic benefits will be required to settle the obligation, and a reliable estimate of the amount of such obligation can be made.

3.9 Taxes

Calculation of the income tax provision requires interpretation of tax law in the jurisdictions where the Ecopetrol Business Group operates. Significant judgment is required to determine estimates for income tax on taxable profits and to evaluate the recoverability of deferred tax assets, which are based on the ability to generate sufficient taxable income during the periods in which such deferred taxes could be used or deduct.

To the extent that future cash flows and taxable income differ significantly from the estimates, the Ecopetrol Business Group's ability to realize the deferred tax assets recorded could be affected.

Furthermore, changes in tax rules could limit the capacity of the Ecopetrol Business Group to obtain tax deductions in future years, as well as the recognition of new tax liabilities resulting from auditing conducted by the tax authorities.

Tax positions taken involve a thorough assessment by Management, and are reviewed and adjusted in response to situations such as expiration in the applicability of laws, closing of tax audits, additional disclosures caused by any legal issue or a court decision relevant to a particular tax issue. The Ecopetrol Business Group records provisions based on estimated potential liabilities that could be derived from a tax audit. The amount of these provisions depends on factors such as previous experience in tax audits and different interpretations of tax legislation. The actual results may differ from the estimates recorded.

3.10 Hedge accounting

The process of identifying hedging relationships between hedged items and the underlying instruments (derivative and non-derivative, such as long-term, foreign currency-denominated debt), and their corresponding effectiveness, requires the use of judgment by management. The Ecopetrol Business Group periodically monitors the alignment between its hedge instruments and its risk management policy.

4. Accounting policies

The accounting policies indicated below have been applied consistently for all the periods presented.

4.1 Financial instruments

A financial instrument is any contract that creates a financial asset for one entity and a financial liability or equity instrument for another entity.

The classification of financial instruments depends on the nature and purpose for which the financial assets or liabilities were acquired and is determined at the time of initial recognition. Financial assets and financial liabilities are initially measured at their fair value.

Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities (other than financial assets and financial liabilities at fair value through profit or loss) are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss are recognized immediately in profit or loss.

Loans and trade receivables, other receivables and financial assets held-to-maturity are measured subsequently measured at amortized cost using the effective interest method.

Additionally, equity instruments are measured at fair value.

Measurements at fair value

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value measurement is based on the presumption that the transaction to sell the asset or transfer the liability takes place in the principal market of the asset or liability or in the absence of a principal market in the most advantageous market.

The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest.

A fair value measurement of a non-financial asset takes into account a market participant's ability to generate economic benefits by using the asset for its most profitable use or by selling it to another market participant that would use the asset in its highest and best use.

The Group uses valuation techniques that are appropriate for the circumstances and for which sufficient data are available to measure fair value, maximizing the use of relevant observable inputs and minimizing the use of unobservable inputs.

All assets and liabilities for which fair value is measured or disclosed in the financial statements are classified within the following scale, based on the lowest level input that is significant to the fair value measurement as a whole, as follows:

- Level 1: Quoted (unadjusted) market prices in active markets for identical assets or liabilities. The fair value of the Ecopetrol Business Group's marketable securities with a quoted market price is based on Level 1 inputs.
- Level 2: Valuation techniques for which the lowest level input that is significant to the fair value measurement is directly or indirectly observed. Level 2 inputs include prices of similar assets, prices obtained through quotations made by stockbrokers, and prices that can be substantially corroborated with other observable data with the same contractual terms.

For derivative contracts for which a quoted market price is not available, fair value estimates are generally determined using models and other valuation methods, the key inputs for which include future prices, volatility estimates, price correlation, counterparty credit risk and market liquidity, as appropriate. For other assets and liabilities, fair value estimations are generally based on the net present value of expected future cash.

- Level 3: Valuation techniques for which the lowest level input that is significant to the fair value measurement is unobservable. The Ecopetrol Business Group does not use Level-3 inputs for the measurement of financial assets and liabilities. The Ecopetrol Business Group may use Level-3 inputs for the calculation the recoverable amount of certain non-financial assets for the purpose of impairment testing.

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Effective interest rate method

The effective interest rate method is a method of calculating the amortized cost of a financial instrument and accounting of income or financial cost over the relevant period. The effective interest rate is the discount rate that exactly discounts estimated future cash receipts or payments (including all fees, transaction costs and other premiums or discounts) through the expected life of the financial instrument (or, when appropriate, at a shorter period), to the net carrying amount on initial recognition.

Impairment

The Ecopetrol Business Group evaluates if there is objective evidence that a financial asset or group of financial assets are impaired. Financial assets are evaluated for the impairment indicators at the end of each reporting period. Financial assets are considered to be impaired when there is objective evidence that, as a result of one or more events that occurred after initial recognition, the estimated future cash flows of the asset have been affected. For financial assets measured at amortized cost, the amount of the impairment loss recognized is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate.

4.1.1 Cash and cash equivalents

Cash and cash equivalents include cash on hand, financial investments that are highly liquid, bank deposits and special funds with original maturity dates of ninety days or less which are subject to an insignificant risk of changes in value.

4.1.2 Financial assets

The classification of financial assets at initial recognition depends on the financial asset's contractual cash flow characteristics and the Group's business model for managing them. With the exception of trade receivables that do not contain a significant financing component or for which the Ecopetrol Business Group has applied the practical expedient, the Ecopetrol Business Group initially measures a financial asset at its fair value plus, and, in the case of a financial asset not at fair value through profit or loss, at transaction costs. Trade receivables that do not contain a significant financing component or for which the Ecopetrol Business Group has applied the practical expedient are measured at the transaction price determined under IFRS 15.

The Ecopetrol Business Group classifies its financial assets in the following categories:

- a) Financial assets measured at fair value through profit or loss

Financial assets are held for trading and financial assets designated at the time of the initial recognition at fair value through profit or loss. Financial assets are classified as held for trading if they are acquired to be sold or repurchased in the short term. They are recognized at their fair value and losses or profits arising at the time of re-measurement are recognized in the statement of profit or loss.

- b) Financial assets measured at fair value with changes in other comprehensive income

These are equity instruments of other non-controlled and non-strategic companies not allowing for any type of control or significant influence thereon and where the Ecopetrol Business Group's management does not intend to negotiate with them in the short term. These investments are recorded at their fair value and unrealized gains or losses are recognized in other comprehensive income.

- c) Financial assets at amortized cost

This category is the most relevant to the Group. The Group's financial assets at amortized cost includes trade receivables, other receivables, loans to associates, and loans to employees.

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Loans and receivables, including trade and other receivables, are measured initially at fair value and then at amortized cost using the effective interest rate method, less impairment.

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Loans to employees are initially recorded using the present value of the future cash flows, discounted at the current market rate for similar loans. If the interest rate is less than the current market rate, fair value will be less than the amount of the loan. This difference is recorded as a benefit to employees.

The Group measures financial assets at amortized cost if both of the following conditions are met:

- The asset is held within a business model with the objective to hold financial assets in order to collect contractual cash flows
- The contractual terms of the asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding

Financial assets at amortized cost are subsequently measured using the effective interest (EIR) method and are subject to impairment analysis. Gains and losses are recognized in profit or loss when the asset is derecognized, modified or impaired.

De-recognition of financial assets

The Ecopetrol Business Group derecognizes a financial asset only upon the expiration of the contractual rights to the cash flows of the asset or, when it has transferred its rights to receive such cash flows or has assumed the obligation to pay the cash flows received in full without material delay to a third party and (a) it has transferred substantially all the risks and benefits inherent in the ownership of the financial asset or (b) it has neither transferred nor retained substantially all the risks and benefits of the asset, but has transferred control of the asset.

When the Ecopetrol Business Group does neither transfer nor retain substantially all the risks and benefits of the asset or transfer control of the asset, the Ecopetrol Business Group continues to recognize the transferred asset, to the extent of its continuing participation, and it also recognizes the associated liability.

4.1.3 Financial liabilities

Financial liabilities correspond to the financing obtained by the Ecopetrol Business Group through bank credit facilities and bonds, accounts payable to suppliers and creditors.

Bonds and bank credit facilities (this is the category most relevant to the Group) are initially recognized at their fair value, net of directly attributable transactions cost. After initial recognition, interest-bearing credit facilities and bonds are subsequently measured at amortized cost, using the effective interest rate (EIR) method. The effective interest method amortization is included as a financial expense in the statement of profit or loss. Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The EIR amortization is included as finance costs in the statement of profit or loss.

Accounts payable to suppliers and creditors are short-term financial liabilities recorded at nominal value, since it does not significantly differ from fair value.

Derecognition

A financial liability is derecognized when the obligation specified in the contract is discharged, cancelled or expires. When an existing financial liability has been replaced by another from the same lender, under substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as the de-recognition of the original liability and recognized as a new liability. The difference between the respective carrying amounts is recognized in the statement of profit or loss.

4.1.4 Derivative financial instruments and hedging activities

Financial instruments are initially recognized at fair value on the date on which a derivative contract is entered into and are subsequently remeasured at fair value. Changes in the fair value of derivatives are recognized as gains or losses in the statement of profit or loss, except for the effective portion of cash flow hedges, which is recognized in other comprehensive income and later reclassified to profit or loss when the hedge item affects profit or loss.

Changes in fair value of derivative contracts, which do not qualify or are not designated as hedges, including forward contracts for the purchase and sale of commodities under negotiation for physical delivery or receipt of the commodity are recorded in profit or loss.

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Derivatives embedded in the host contract are accounted for as separate derivatives at fair value if their economic characteristics and risks are not closely related to those of the host contracts and the host contracts are not held for trading or designated at fair value through profit or loss. These embedded derivatives are measured at fair value with changes in fair value recognized in profit or loss.

4.1.5 Hedging operations

For purposes of hedge accounting, hedges are classified as:

- Cash flow hedges: hedges of the exposure to variability in cash flows attributable to a particular risk associated with all, or a component of, a recognized asset or liability or a highly probable forecast transaction, and that could affect profit or loss.
- Hedges of net investments in foreign operations.
- Fair value hedges: hedges of the exposure to changes in fair value of a recognized asset or liability or an unrecognized firm commitment, or a component of any such item, that is attributable to a particular risk and that could affect profit or loss.

At the inception of a hedge relationship, the Group formally designates and documents the hedge relationship to which it wishes to apply hedge accounting and the risk management objective and strategy for undertaking the hedge. Such hedges are expected to be highly effective in achieving offsetting changes in fair value or cash flows and are assessed on an ongoing basis to determine whether they have been highly effective throughout the financial reporting periods for which they were designated.

4.1.5.1 Cash flow hedge

The effective portion of the gain or loss on the hedging instrument is recognized in Other Comprehensive Income (OCI) in the cash flow hedge reserve, while any ineffective portion is recognized immediately in the statement of profit or loss.

The amounts previously accumulated in OCI are recognized in profit or loss when the hedged transaction affects the statement of profit or loss. If the hedged transaction subsequently results in the recognition of a non-financial item, the amount accumulated in equity is removed from the separate component of equity and included in the initial cost or other carrying amount of the hedged asset or liability.

If the hedging instrument expires or is sold, terminated or exercised without replacement or rollover, or if its designation as a hedge is revoked or when the hedge no longer meets the criteria for hedge accounting, any cumulative gain or loss previously recognized in other comprehensive income remains separately in equity until the forecast transaction occurs is recognized in the consolidated statement of profit or loss. When it is no longer expected that the initially hedged transaction will occur.

Ecopetrol designates long-term loans as hedging instruments for its exposure to the exchange risk in future oil exports. See Note 30.3 for further information.

4.1.5.2 Hedge of net investment in a foreign operation

Hedges of a net investment in a foreign operation, including a hedge of a monetary item that is accounted for as part of the net investment, are accounted for in a way similar to cash flow hedges.

Gains or losses on the hedging instrument relating to the effective portion of the hedge are recognized as OCI while any gains or losses relating to the ineffective portion are recognized in the statement of profit or loss. On the disposal of a foreign operation, the cumulative value of any such gains or losses recorded in equity is transferred to the statement of profit or loss.

Ecopetrol allocates long-term loans as hedging instruments for its exposure to foreign exchange risk on its investment in subsidiaries whose functional currency is the U.S. dollar. See Note 30.4 for further information.

4.1.5.3 Fair value hedge

The gain or loss on the hedging instrument shall be recognized in profit or loss or other comprehensive income, if the hedging instrument hedges an equity instrument for which an entity has elected to present changes in fair value in other comprehensive income.

The hedging gain or loss on the hedged item shall adjust the carrying amount of the hedged item (if applicable) and be recognized in profit or loss. If the hedged item is a financial asset (or a component thereof) that is measured at fair value through other comprehensive income, the hedging gain or loss on the hedged item shall be recognized in profit or loss. However, if the hedged item is an equity instrument for which an entity has elected to present changes in fair value in other comprehensive income, those amounts shall remain in other comprehensive income.

4.2 Inventories

Inventories are stated at the lower of cost and net realizable value.

Inventories mainly comprise crude oil, fuels and petrochemicals and consumable inventories (spares and supplies).

The cost of crude oil is the production costs, including transportation costs.

The cost required to bring a pipeline into working order, is treated as part of the related pipeline.

The cost of other inventories is determined based on the weighted average cost method, which includes acquisition costs (deducting commercial discounts, rebates and other similar items), transformation, and other costs incurred to bring inventory to their current location and condition, such as transportation costs.

Consumable inventories (spares and supplies) are recognized as inventory and then charged to expense, maintenance or project to the extent that such items are consumed.

Ecopetrol estimates the net realizable value of inventories at the end of the period. When the circumstances that previously caused inventories to be written down below cost no longer exist, or when there is clear evidence of an increase in the net realizable value because of a change in economic circumstances, the amount of the write down is reversed. The reversal cannot be greater than the amount of the original write down, so that the new carrying amount will always be the lower of the cost and the revised net realizable value.

4.3 Related parties

Related parties are considered those in which one party has the ability to control, or has joint control of the other, or exercises significant influence over the other party in making financial or operational decisions, or is a member of key management personnel (or close relative of a member). The Ecopetrol Business Group considers related parties to be associates, joint ventures, key management executives, entities managing resources for payment of employee post-employment benefit plans and Colombian government entities for the purposes of certain relevant transactions, such as the purchase of hydrocarbons and the fuel price stabilization fund (see Note 31 – Related parties).

4.3.1 Investments in associates

An associate is an entity over which the Ecopetrol Business Group has significant influence but not control. Significant influence is the power to participate in the financial and operational policy decisions of the investee, but it is not control or joint control over those policies. Generally, these entities are those in which the Ecopetrol Business Group holds an equity interest with voting rights of 20% to 50%. See Exhibit I – *Consolidated companies, associates and joint ventures for further details*.

Investments in associates are accounted for using the equity method. Under this method, the investment in an associate is initially recognized at cost. The carrying amount of the investment is adjusted to recognize changes in the Ecopetrol Business Group's share of net assets of the associate since the acquisition date. Goodwill related to the associate is included in the carrying amount of the investment and it is not tested for impairment separately.

The Ecopetrol Business Group's share of the results of operations of the associate is recognized in the consolidated statement of profit or loss. Any change in other comprehensive income is recognized in other comprehensive income of the Ecopetrol Business Group.

After application of the equity method, the Ecopetrol Business Group determines if it is necessary to recognize an impairment on its investment in its associate. The Ecopetrol Business Group determines whether there is objective evidence that the investment is impaired. If there is such evidence, the amount of the impairment is calculated as the difference between the recoverable amount and its carrying value, and then the impairment is recognized in the consolidated statement of profit or loss.

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When necessary, the Ecopetrol Business Group makes adjustments to the accounting policies of associates to ensure consistency with the policies adopted by the Ecopetrol Business Group. Additionally, the equity method of these companies is measured on their most recent financial statements.

4.3.2 Joint ventures

A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint arrangement. Joint control exists only when decisions about the relevant activities require unanimous consent of the parties sharing such control. The accounting treatment for the recognition of joint ventures is the same as investments in associates.

4.4 Joint operations

A joint operation is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the assets and obligations for the liabilities, relating to the arrangement.

Joint operation contracts are entered into between Ecopetrol and third parties to share risk, secure capital, maximize operating efficiency and optimize the recovery of reserves. In these joint operations, one party is designated as the operator to execute the operations and report to partners according to their participating interests. Likewise, each party takes its share of the produced hydrocarbons (crude oil or gas), according to their share in production.

When Ecopetrol participates as a non-operator partner, it recognizes the assets, liabilities, sales revenues, cost of sales and expenses based on the operator's report. When Ecopetrol is the direct operator of joint venture contract, it recognizes its percentage of assets, liabilities, sales revenues, costs and expenses, based on the participation of each partner in the items corresponding to assets, liabilities, sales revenues, costs and expenses.

When the Ecopetrol Business Group acquires or increases its participation in a joint operation in which the activity constitutes a business combination, such transaction is recognized applying the acquisition method in accordance with IFRS 3 – Business combination. The acquisition cost is the sum of the consideration transferred, which corresponds to the fair value, on the date of acquisition of the assets transferred and the liabilities incurred. Any transaction cost related to the acquisition or increased share in the joint operation that constitutes a business combination is recognized in the consolidated statement of profit or loss.

The excess of the sum of the consideration transferred and the amount paid in the operation is recognized as goodwill. If the result is in an excess value of the net assets acquired over the amount paid in the purchase transaction, the difference is recognized as income in the consolidated statement of profit or loss on the date of recognition of the transaction.

4.5 Non-current assets held for sale

Non-current assets are classified as held for sale if their carrying values will be recovered principally through a sale transaction rather than through continued use. Non-current assets are classified as held for sale only when the sale is highly probable within one year from the classification date and the asset (or group of assets) is available for immediate sale in its present condition. These assets are measured at the lower of their carrying amount and fair value less related costs of disposal.

4.6 Property, plant and equipment

Recognition and measurement

Property, plant and equipment are stated at cost less accumulated depreciation and accumulated impairment losses. Tangible components related to natural and environmental resources are part of property, plant and equipment.

The initial cost of an assets comprises its purchase price or construction cost, including import duties and non-refundable purchase taxes, any costs directly attributable to bringing the asset into operation, costs of employee benefits arising directly from the construction or acquisition, borrowing costs incurred that are attributable to the acquisition and construction of qualifying assets and the initial estimate of the costs of dismantling and abandonment of the item.

Spare parts and servicing equipment are recorded as inventories and recognized as an expense as they are used. Major spare parts and stand-by equipment that the entity expects to use during more than one period are recognized as property, plant and equipment.

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Any gain or loss arising from the disposal of a property, plant and equipment is recognized in profit or loss of the period.

Subsequent disbursements

Subsequent disbursements correspond to all payments to be made on existing assets in order to increase or extend the initial expected useful life, increase productivity or productive efficiency, allow for significant reduction of operating costs, increase the level of reserves in exploration or production areas or replace a part or component of an asset that is considered critical for the operation.

The costs of repair, conservation and maintenance of a day to day nature are expensed as incurred. However, disbursements related to major maintenance are capitalized.

Depreciation

Property, plant and equipment is depreciated using the straight-line method, except for those associated with exploration and production activities which are depreciated using the units-of-production method. Technical useful lives are updated annually considering factors such as: additions or improvements (due to parts replacement or critical components for the asset's operation), technological advances, obsolescence and other factors; the effect of this change is recognized from the period in which it was executed. Depreciation of an asset starts when it is ready to be used.

Useful lives are determined based on the period over which an asset is expected to be available for use, physical exhaustion, technical or commercial obsolescence and legal limits or restrictions over the use of the asset.

The estimated useful life of assets fluctuates in the following ranges:

Plant and equipment	10 – 55 years
Pipelines, networks and lines	10 – 40 years
Buildings	10 – 42 years
Other	3 – 35 years

Lands are recognized separately from buildings and facilities and it is not subject to depreciation.

Depreciation methods and useful lives are reviewed annually and adjusted if appropriate.

4.7 Natural and environmental resources

Recognition and measurement

Ecopetrol uses the successful efforts method to account for exploration and production of crude oil and gas activities, following the provisions of IFRS 6 – Exploration for the evaluation of mineral resources.

Exploration costs

Acquisition and exploration costs are recorded as exploration and evaluation assets until the determination of whether the exploration drilling is successful or not; if determined to be unsuccessful, all costs incurred are recognized as expenses in the statement of profit or loss.

Exploration costs are those incurred with the objective of identifying areas that are considered to have prospects of containing oil and gas reserves, including geological and geophysical, seismic costs, viability, and others, which are recognized as expenses when incurred. Furthermore, disbursements associated with the drilling of exploratory wells and those related to stratigraphic wells of an exploratory nature are charged as assets until it is determined if they are commercially viable; otherwise, they are expensed in the consolidated statement of profit or loss as dry wells expense. Other expenditures are recognized as expenses when incurred.

An exploration and evaluation asset is no longer classified as such when the technical feasibility and commercial viability of extracting a mineral resource are demonstrable. Exploration and evaluation assets are reclassified to the natural and environmental resources account after being assessed for impairment.

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All capitalized costs are subjected to technical and commercial revisions at least once a year to confirm the evaluation and exploration efforts continue on the fields; otherwise, these costs are written off through to profit or loss.

Exploration costs are net of the revenues obtained from the sale of crude oil during the extensive testing period, net of cost of sales, since they are considered necessary to complete the asset.

Development costs

Development costs correspond to those costs incurred to obtain access to proved reserves and to provide facilities for extracting, treating, gathering and storing. When a project is approved for development, the corresponding capitalized acquisition and exploration costs are classified as natural and environmental resources and costs subsequent to the exploration phase are capitalized as development costs of the properties that contain such natural resources. All development costs are capitalized, including drilling costs of unsuccessful development wells.

Production costs

Production costs are those incurred to operate and maintain productive wells, and are part of the corresponding equipment and facilities. Production activity includes extraction of oil and gas to the surface, its gathering, treatment and processing as well as storage in the field. Production costs are expenses recorded in the consolidated statement of profit or loss as incurred unless they add oil and gas reserves, in which case they are capitalized.

Production and support equipment is recognized at cost and is part of property, plant and equipment subject to depreciation.

Capitalized costs also include decommissioning, dismantling, retiring and restoration costs, as well as the estimated cost of future environmental obligations. The estimation includes plugging and abandonment costs, facility dismantling and environmental recovery of areas and wells. Changes arising in new abandonment liability estimations and environmental remediation are capitalized in the carrying amount of the related asset.

Depletion

Depletion of natural and environmental resources is determined using the unit-of-production method per field, using proved developed reserves as a base, except in limited exceptional cases that require greater judgment by Management to determine a better amortization factor of future economic benefits over the useful life of the asset. Depreciation/depletion rates are reviewed annually, based on reserves reports and the impact of any changes is recognized prospectively in the financial statements.

Reserves are independently estimated by internationally recognized external consultants and approved by Ecopetrol's Board of Directors. Proved reserves consist of the estimated quantities of crude oil and natural gas demonstrated with reasonable certainty by geological and engineering data to be recoverable in future years from known reserves under existing economic and operating conditions, that is, at the prices and costs that apply at the date of the estimation.

Impairment

Assets associated to exploration, evaluation and production are subject to review for possible impairment in their carrying amount. See Notes 3.2 — *Impairment of non-current assets* and 4.12 — *Impairment of non-current assets*.

4.8 Capitalization of borrowing costs

Borrowing costs related to the acquisition, construction or production of a qualifying asset that requires a substantial period of time to get ready for its intended use are capitalized as part of the cost of such asset when it is probable that future economic benefits associated with the item will flow to the Ecopetrol Business Group and costs can be measured reliably. Other borrowing costs are recognized as finance costs. Projects that have been suspended but that the Ecopetrol Business Group intends to continue to pursue their development in the future, are not considered qualifying assets for the purpose of capitalization of borrowing costs.

4.9 Intangible assets

Intangible assets with a defined useful life, are stated at cost less accumulated amortization and any impairment loss. Intangible assets are amortized under the straight-line method, over their estimated useful lives. The estimated useful lives and amortization method are revised at the end of each reporting period; any change in estimates is recognized on a prospective basis.

The disbursements related to research activities are expensed as incurred.

4.10 Business combinations

The Group recognizes business combinations using the acquisition method. Identifiable assets acquired and liabilities assumed are initially measured at fair value on the acquisition date, subject to certain exceptions.

On the acquisition date, the acquirer will separately recognize the identifiable assets acquired, the liabilities assumed, any non-controlling interest in the acquiree, and any goodwill or bargain purchase resulting from the acquisition.

The company that acted as buyer will recognize the goodwill generated as an asset on the acquisition date, measured as the difference between (i) the aggregate of the consideration transferred, the amount of any non-controlling interest and in a business combination achieved in stages the acquisition-date fair value of the acquirer's previously held equity interest in the acquiree and (ii) the net amount on the acquisition date of the identifiable assets acquired and the liabilities assumed.

Goodwill is initially measured at cost (being the excess of the aggregate of the consideration transferred and the amount recognized for non-controlling interest and any previous interest held over the net identifiable assets acquired and liabilities assumed). After initial recognition goodwill is measured at cost less any accumulated impairment loss, which cannot be reversed in subsequent periods according to IAS 36. Goodwill is not amortized but tested for impairment annually.

The acquirer will identify the acquisition date as the date on which control of the acquiree is obtained.

The measurement period is the period after the acquisition date during which the acquirer can adjust the provisional amounts recognized in a business combination. The measurement period cannot exceed one year from the acquisition date.

During 2019 and 2020 the Group recognized transactions as business combinations (Note 12).

4.11 Leases

As of January 1, 2019, the Ecopetrol Business Group adopted IFRS 16, "Leases" ("IFRS 16") applying the modified retrospective scope.

At the beginning of a contract, the Business Group assesses whether a contract is, or contains, a lease. This situation arises if the contract transfers the right to control the use of an identified asset for a period of time in exchange for a consideration. To assess whether a contract conveys the right to control an identified asset, the regulations of IFRS 16 are used.

Ecopetrol Business Group as a lessee

On the commencement date of the lease, Ecopetrol Business Group recognizes lease liabilities to make lease payments and right-of-use assets representing the right to use the underlying asset during the lease term. The interest expense on the lease liability and the depreciation expense on the right-of-use asset are recognised separately.

In subsequent recognition, Ecopetrol business Group makes a remeasurement of the lease obligation upon the occurrence of events such as: a) changes in the lease term, b) changes in future lease payments resulting from variations in an index or in the rate used for determine the payments. The amount of the remeasurement of the obligation will be recognized as an adjustment to the asset for the right of use.

Ecopetrol Business Group as a lessor

Leases in which the Ecopetrol Business Group does not transfer substantially all the risks and rewards incidental to ownership of an asset are classified as operational. Rental income is recognized in the statement of profit or loss on a straight-line basis over the lease terms.

Right-of-use assets

The Ecopetrol Business Group recognizes right-of-use assets on the commencement date of the lease (that is, the date on which the underlying asset is available for use). The right-of-use assets are measured at cost, less any accumulated depreciation and impairment losses, and adjusted for any remeasurement of the lease liabilities. Right-of-use assets are amortized in a straight-line basis during the lease term. Right-of-use assets are subject to impairment assessment. The cost of right-of-use assets includes the amount of lease liabilities recognized, initial direct costs incurred, and lease payments made at or before the commencement date less any lease incentives received.

Lease liabilities

At the commencement date of the lease, the Ecopetrol Business Group recognizes lease liabilities measured at the present value of the lease payments to be made during the term of the lease. The lease payments include fixed payments (including in-substance fixed payments) less any lease incentives receivable, variable lease payments that depend on an index or a rate, and amounts expected to be paid under residual value guarantees. Variable payments that do not depend on an index or rate are recognized as expenses in the period in which an event or condition indicates that the payment will occur.

In order to calculate the present value of the lease payments, the Ecopetrol Business Group uses the incremental borrowing rate on the lease's commencement date. After the commencement date, the amount of lease liabilities is increased to reflect the accretion of interest and reduced for the lease payments made. In addition, the carrying amount of lease liabilities is remeasured if there is a modification, a change in the lease term, a change in the lease payments or a change in the assessment of an option to purchase the underlying asset.

Short-term leases and low-value asset leases

The Ecopetrol Business Group elected to use the recognition exemptions for lease contracts that, at the commencement date, have a lease term of 12 months or less and do not contain a purchase option (short-term leases), and lease contracts for which the underlying asset is of low value (low-value assets).

Joint Operating Agreements (JOA)

In JOA agreements, the Ecopetrol Business Group assesses whether it controls the use of the asset. If the Ecopetrol Business Group, as the operator, controls the use of the asset, it recognizes the entire right-of-use and lease liability in the consolidated financial statements. If it is the JOA who controls, it is analyzed whether the contract meets the characteristics of a sublease, and in that case each party must recognize the right of use in proportion to their participation.

4.12 Impairment of non-current assets

In order to evaluate if any tangible or intangible assets are impaired, Ecopetrol compares its carrying amount with its recoverable amount at the end of each reporting period or earlier, if there is any indicator that an asset may be impaired.

For purposes of impairment testing, assets are grouped into cash generating units (CGU), provided that those assets individually considered do not generate cash inflows that, to a greater extent, are independent from those generated by other assets or CGUs. The grouping of assets in different CGUs requires the exercise of professional judgment and the consideration, among other parameters, of the business segments. In this sense, in the Exploration and Production segment, each CGU corresponds to each one of the different contractual areas commonly called "fields"; by exception, in those cases where the cash inflows generated by several fields are interdependent from each other, those fields are grouped into a single CGU. In the case of the Refining and Petrochemicals, each CGU corresponds to each one of the refineries and companies in this segment of the Ecopetrol Business Group and for the Transportation segment; each pipeline system is considered an independent CGU.

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The recoverable amount of an asset is the higher amount of the fair value less costs of disposal or its value in use. If the recoverable amount of an asset (or of a CGU) is lower than its net carrying amount, such amount (or that of the CGU) is reduced to its recoverable amount, recognizing an impairment loss in profit or loss.

Fair value less costs of disposal is usually higher than the value in use for the asset's in the production segment due to some significant restrictions in the estimation of future cash flows, such as: a) future capital expenses that improve the CGU performance, which could result in expected increase of net cash flows, and b) items before taxes that reflect specific business risks, resulting in a higher discount rate.

Fair value less costs of disposal is determined as the sum of the future discounted cash flows adjusted to the estimated risk. The estimations of expected future cash flows used in the assessment of impairment of the assets include estimates of futures commodity prices, supply and demand estimations, and the margins of the products.

Fair value less costs of disposal, as described above, is compared to valuation multiples and quoted prices of shares in companies comparable to Ecopetrol, in order to determine if it is reasonable.

When an impairment loss is recorded, future amortization expenses are calculated on the basis of the adjusted recoverable amount. Impairment losses may be recovered only if the reversal is related to a change in estimations used after impairment loss was recognized in previous periods. These recoveries do not exceed the carrying amount of the assets net of depreciation or amortization that would have been determined if such impairment had not been recognized.

The carrying amount of non-current assets reclassified as assets held-for-sale is compared to its fair value less costs of disposal. No other provision for depreciation, depletion or amortization is recorded if the fair value less costs of sale is lower than the carrying amount.

4.13 Provisions and contingent liabilities

Provisions are recognized when the Ecopetrol Business Group has a current obligation (legal or constructive) as a result of a past event, it is probable that Ecopetrol will be required to settle the obligation, and a reliable estimation can be made of the amount of the obligation. Where applicable, they are recorded at present value, using a rate reflecting the risk specific to the liability.

Future environmental decommissioning costs related to current or future operations, are accounted for as expenses or assets, as the case may be. Expenditures related to past operations that do not contribute to the obtaining of current or future benefits, are expensed as incurred.

The recognition of these provisions coincides with the identification of an obligation related to environmental remediation and Ecopetrol uses available information to determine a reasonable estimation of the related cost.

Provisions for which a negative outcome is assessed as possible are not recognized but are disclosed in the explanatory notes; including those for which the amount cannot be estimated.

If there is an expectation that the provision will be reimbursed, either in whole or in part, for example by virtue of an insurance contract, the amounts expected to be reimbursed are recognized as a separate asset only when such reimbursement is almost certain.

If the effect of the time value of money is significant, the provisions are discounted using the current market rate before taxes reflecting, as applicable, the liability specific risks. When recognizing the discount, the increase of the provision resulting from time elapsed is recognized as financial cost in the profit or loss statement.

Asset retirement obligation

Liabilities associated with the retirement of assets are recognized when there are current obligations, either legal or constructive, related to the abandonment and dismantling of wells, facilities, pipelines, buildings and equipment.

The obligation is usually recorded when the assets are installed or when the surface or the environment are altered at the operating sites. These liabilities are calculated using the discounted cash flow method, using a pre-tax rate reflecting current market conditions similar liabilities and considering the economic limits of the field or the useful life of the respective asset. When it is not possible to determine a reliable estimation in the period in which the obligation originates, a provision is recognized when there is enough information available to make the best estimation.

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The carrying amount of the provision is reviewed and adjusted annually considering changes in the assumptions used for its estimation, using a risk-free rate adjusted by a premium that reflects the risk and the company credit rating under the current market conditions. Any change in the present value of the estimated expenditure is reflected as an adjustment to the provision and the corresponding property, plant and equipment and natural and environmental resources. When a decrease in the asset retirement obligation related to a producing asset exceeds the carrying amount of the asset, the excess is recognized in the consolidated statement of profit or loss. The increase in the provision due to the passage of time is recognized in results for the period as a financial expense.

4.14 Income tax and other taxes

Income tax expense is comprised of income tax payable for the period and the effect of deferred taxes in each period.

Current income taxes are recognized in income except when they relate to items recognized in other comprehensive income, in which case the corresponding tax effect is also recognized in other comprehensive income. Income tax assets and liabilities are presented separately in the consolidated statement of financial position, except where there is a right of setoff within fiscal jurisdictions and an intention to settle such balances on a net basis.

Income tax is paid by each legal entity and not on a consolidated basis.

4.14.1 Current income tax

The Ecopetrol Business Group determines the provision for income tax based on the highest amount between taxable income and presumptive income (the minimum estimated amount of taxable profit on which the law expects to quantify and collect income taxes). Taxable income differs from profit before tax as reported in the consolidated statement of profit or loss, because of: items of income or expense that are taxable or deductible in other periods, special taxable deductions, tax losses and income and line items measured that, according to applicable tax laws in each jurisdiction, are considered nontaxable or nondeductible.

4.14.2 Deferred income tax

Deferred tax is provided using the liability method for temporary differences between the carrying amounts of existing assets and liabilities in the consolidated financial statements and their respective tax bases. A deferred tax liability is recognized for all taxable temporary differences. A deferred tax asset is recognized for all deductible temporary differences and for all accumulated tax losses, if there is a reasonable expectation that the Ecopetrol Business Group will generate future tax profits against which they will be used.

Deferred taxes on assets and liabilities are calculated based on the tax rates that are expected to apply during the years in which temporary differences between the carrying amounts and tax bases are expected to be reversed.

The carrying amount of a deferred tax asset is subject to review at the end of each reporting period, and it is reduced to the extent it is no longer probable that the corresponding legal entity will generate enough future taxable profit to realize such deferred tax asset.

In the statement of financial position, deferred tax assets are reflected net and as an offset against deferred tax liabilities, depending on the overall tax position in a particular jurisdiction and on the same taxable entity.

Deferred taxes are not recognized when they arise in the initial recognition of an asset or liability in a transaction (except in a business combination) and at the time of the transaction, do not affect the accounting or tax profit, or in respect of the taxes on the possible future distribution of accumulated profits of subsidiaries or investments accounted for by the equity method, if at the time of the distribution it may be controlled by Ecopetrol and it is probable that the retained earnings will be reinvested by the Ecopetrol Business Group companies and, therefore, will not be distributed to the Group.

4.14.3 Other taxes

The Ecopetrol Business Group recognizes in profit or loss the costs and expenses related to other taxes than the income tax, such as the wealth tax, which is determined based on the tax equity, the industry and commerce tax on income obtained in the municipalities for performance of commercial, industrial and service activities, and the transport tax on volumes loaded in the transport systems. Taxes are calculated in accordance with current tax regulations. For more details, see Note 10.

4.15 Employee benefits

Salaries and benefits for Ecopetrol's employees are governed by the Colombian Collective Labor (Agreement 01 of 1977), and, by the Colombian Substantive Labor Code. In addition to the benefits determined by labour laws, employees are entitled to fringe benefits which are subject to the place of work, type of work, length of service, and basic salary. An annual interest of 12% is recognized on accumulated severance amounts for each employee, and the payment of compensation is provided for when special circumstances arise resulting in the non-voluntary termination of the contract, without justified cause, and in periods other than the probationary period.

Ecopetrol belonged to the special pension regime under which pension liabilities are Ecopetrol's responsibility and not pension fund's responsibility. However, Law 797 of January 29, 2003 and Legislative Act 001 of 2005 determined that Ecopetrol will no longer belong to the said regime and that from that point on employees would be part of the General Pension Regime. Consequently, pension obligations related to employees pensioned until July 31, 2010 are still Ecopetrol's responsibility. Employees are entitled to such pension bonus if they worked with Ecopetrol prior to January 29, 2003, but whose labor agreement expired without renewal before that date.

All labor benefits of employees who joined Ecopetrol before 1990 are Ecopetrol's responsibility, without the involvement of any social security entity or institution. Service cost for the employee and his/her relatives registered with Ecopetrol is determined by means of a mortality table, prepared based on facts occurring during the year.

For employees who joined Ecopetrol after the Act 50 of 1990 went in effect, Ecopetrol makes periodic contributions for severance payments, pensions and labor risks to the respective funds.

In 2008, Ecopetrol partially settled the value corresponding to monthly pension payments from its pension liabilities, transferring such liabilities and their underlying amounts to autonomous pension funds (PAP, for its acronym in Spanish). The funds transferred, and returns on those funds, cannot be redirected, nor can they be returned to the Ecopetrol Business Group, until all of the pension obligations have been fulfilled. The settled obligation covers allowances and pension bonds payments, with health and education remaining Ecopetrol's responsibility.

Employee benefits are divided into four groups comprised as follows:

a) Short-term employee benefits and post-employment defined benefits:

Benefits to employees in the short term mainly correspond to those which payment will be made in the term of twelve months following the closing of the period in which the employees have rendered their services. These mainly include salaries, severance payments, vacation, bonuses and other benefits.

Post-employment benefits of defined contributions plans correspond to the periodic payments for severance, pensions and labor risk payments that the Ecopetrol Business Group makes to the respective funds that assume these obligations in their entirety.

The above benefits are recognized as an expense with an associated liability after deducting any already paid amounts.

b) Post-employment defined benefit plans:

In the defined benefits plan, the Ecopetrol Business Group provides the benefits agreed to current and former employees and assumes the actuarial and investment risks.

The following benefits are classified as long-term defined benefit plans recognized in the financial statements according to the calculations of an independent actuary:

- Pensions
- Pension bonds
- Health
- Educational plan
- Retroactive severances

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Liabilities recognized in the statement of financial position with respect to these benefit plans are determined based on the present value of the defined benefit obligation at the date of the statement of financial position less the fair value of plan assets.

The defined benefit obligation is calculated annually by independent actuaries using the projected credit unit method, which takes into account employees' years of service and, for pensions, average or final pensionable remuneration. This obligation is discounted at its present value using interest rates of high-quality government bonds denominated in the currency in which the benefits will be paid and of a duration consistent with the plan obligations.

These actuarial calculations involve several assumptions that could differ from the events that will effectively take place in the future. Said assumptions include the determination of a discount rate, future salary increases, mortality rates and future pension increases. Because of the complexity of the calculation, the underlying assumptions and long-term nature of these plans, the obligations for defined benefits are extremely sensitive to changes in assumptions. All key assumptions are revised at the end of the reported period.

In determining the appropriate discount rate, in absence of a broad high quality bond market, Management considers interest rates corresponding to the class B TES bonds issued by the Colombian Government as its best reference, at an appropriate discount rate with maturities extrapolated in line with the term expected for each benefit plan. The mortality rate is based on the particular country's rate, the latest version of which is the RV08 mortality table published in resolution 1555 of October 2010. The future salary and pension increases are linked to the country's future inflation rates. Note 22 – *Provisions for employee benefits* provides further details on key assumptions used.

The amounts recognized in the consolidated statement of profit or loss related to employees defined benefit plans are comprised mainly by service cost and the net financial expense. Service cost includes mainly the increase in present value of the benefit obligation during the period (current service cost) and the amount resulting from a new benefit plan. Plan amendments corresponds to changes in benefits and are usually recognized when all legal and regulatory approvals have been obtained and the effects have been conveyed to the employees involved. The net financial expense is calculated using the net liability for defined benefits as compared with the yield curve of the discount rate at the beginning of each year for each plan. The net defined benefit obligation or asset resulting from actuarial profits and losses, the asset ceiling effect and the asset profitability, excluding the value of recognized in the consolidated statement of profit or loss, are recognized in other comprehensive income.

When the plan assets exceed the gross obligation, the recognized asset is limited to the lower of the surplus in the defined benefits plan and the ceiling of assets determined using a discount rate based on Colombian Government bonds.

(a) Others long-term benefits

Others long-term benefits include the five-year term bonus which also considered in the actuarial calculation. This benefit is a cash bond that accumulates annually and is paid every five years to employees. The Ecopetrol Business Group recognizes in the consolidated statement of profit or loss the service cost, the net financial cost and the adjustment to the obligation of the defined benefit plan.

(b) Termination benefits

Termination benefits are recognized only when a detailed plan exists and there is no possibility to withdraw the offer. The Ecopetrol Business Group recognizes a liability and an expense for termination benefits at the earliest date between the date when the offer of such benefits cannot be withdrawn and the date when the restructuring costs are recognized.

4.16 Revenue from contracts with customers

The Ecopetrol Business Group's business is based on three principal sources of revenue from customer contracts: 1) sales of crude oil and natural gas, 2) services associated with the transport of hydrocarbons, and 3) sales of refined products, petrochemicals and biofuels. Revenue from customer contracts is recognized when control of the goods or services are transferred to the customer at an amount that reflects the consideration that the Ecopetrol Business Group expects to receive in exchange for those goods or services.

Sales of crude oil and natural gas

Revenue from sales of crude oil and natural gas is recognized upon transfer of control to the buyer. This generally occurs when the product is physically transferred into a vessel, pipe or by another delivery method, thus fulfilling the Ecopetrol Group's performance obligations to its customers.

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For some natural gas supply contracts with a replacement period, a distinction is made between quantities of gas consumed and not consumed in order to recognize the respective revenue or liability relating to quantities that will be requested in the future. Once the customer claims such natural gas, the revenue is recognized.

Services associated with hydrocarbons transport

Revenue from hydrocarbons transport services is recognized when the service is provided to the customer and there are no contractual conditions that prevent recognition of the revenue. Ecopetrol Business Group companies are principal in providing these services.

Ship/ Take-or-Pay contracts for the sale of refined products, storage and transport specify minimum quantities of products or services for which a customer will pay, even if the latter does not receive them or use them ("deficient quantities"). Although the Ecopetrol Business Group expects customers to recover all deficient quantities to which they are contractually entitled, any load revenue received related to temporary shortfalls that will be offset in a future period will be deferred and that amount recognized as revenue in the event any of the following scenarios occurs:

- a) The customer exercises its right to deficient volumes or services, or
- b) The possibility is remote that the customer will exercise its right to deficient volumes or services.

Refined products and biofuels

In the case of refined products and petrochemicals, such as fuel oil, asphalt, polyethylene, LPG and propane and gasoline, etc., revenue is recognized when the products are shipped and delivered by the refinery; subsequently, they are adjusted for price changes, in the case of products with regulated prices. In the case of the companies that distribute natural gas and LPG, the revenue from the services are recognized when the service is provided to the customer.

In other cases the, Ecopetrol Business Group recognizes revenue when the performance obligation is satisfied, giving rise to the certain, probable and quantifiable right to demand payment.

Under current local regulation, Ecopetrol sells regular gasoline and ACPM in Colombia at a regulated price.

In accordance with Decree 1068 of 2015, the Ministry of Mines and Energy semiannually calculates and settles Ecopetrol's net position to be stabilized for each fuel by the Fuel Price Stabilization Fund (FEPC, for its acronym in Spanish). The net position corresponds to the sum of the spreads throughout the period, the result of which is the amount in pesos owed to the Company and charged to the resources of the FEPC. The differential corresponds to the product between the volume reported by the Company at the time of sale and the difference between the parity price and the reference price, the parity price being that which corresponds to the daily prices of motor and diesel gasoline observed during the month, expressed in pesos, referenced to the Gulf of the United States market, calculated by applying Resolution 18 0522 of 2010, and the reference price is the Producer Income defined by the Ministry of Mines and Energy for these purposes. Therefore, this differential constitutes a greater or lesser value of sales revenue and a receivable or payable account for Ecopetrol.

According to the risk profiles, the Ecopetrol Business Group manages advance payment systems for some of its customer contracts.

Significant financing component

Generally payments received from customers are short term. Using the practical expedient in IFRS 15, the Group does not adjust the promised amount of consideration for the effects of a significant financing component if it expects, at contract inception, that the period between the transfer of the promised good or service to the customer and the customer's payment for that good or service to be one year or less.

Variable considerations

Upon fulfillment of the obligations set forth in agreements with customers, via delivery of the product or provision of the service, variable components of the transaction price may exist, such as the exchange rate for crude exports or international price fluctuations. In these cases, the Ecopetrol Business Group will make its best estimate of the transaction price that reflects the goods and services transferred to customers.

Agreements signed with customers do not include variable considerations such as rebates, refunds or discounts.

Non-cash considerations

Agreements signed in the Ecopetrol Business Group does not consider non-cash transactions.

Customer advances

These correspond to contractual obligations in which the Ecopetrol Business Group receives advances from customers. These advances by customers form part of the policies and risk assessment defined by the Business Group.

4.17 Costs and expenses

Costs and expenses are presented according to their nature; they are detailed in the related disclosures in cost of sales, and administrative, operating, projects and other associated expenses.

4.18 Finance income (expenses)

Finance income and expenses include mainly: a) borrowings costs on loans and financing, except for those that are capitalized on qualifying asset, b) gains and losses on changes in fair value of financial instruments measured at fair value through profit or loss, c) currency exchange differences of financial assets and liabilities, except for debt instruments designated as hedging instruments, d) interest expenses as a result of discounting long-term liabilities (abandonment costs and pension liabilities), e) dividends derived from equity instruments measured at fair value with changes in other comprehensive income.

4.19 Information by business segment

Ecopetrol presents the information related to its business segments in its consolidated financial statements in accordance with paragraph 4 of IFRS 8 – Operation segments.

The operations of the Ecopetrol Business Group are performed through three business segments: 1) Exploration and Production, 2) Transport and Logistics and 3) Refining, Petrochemical and Biofuels. Segments are determined based on management objectives and corporate strategic plans, considering that these businesses: (a) are engaged in different commercial activities, which generate sales revenue and incur costs and expenses; (b) the operational results are revised regularly by the Ecopetrol Business Group's Governance that makes operational decisions to allocate resources to the various segments and assess their performance; and (c) there is differentiated financial information available. Internal transfers represent sales to inter-company segments and are recorded and presented at market prices.

- a) **Exploration and production:** This segment includes activities related to the exploration and production of oil and gas. Revenues are derived from sales of oil and natural gas at market prices to other segments and to third parties (domestic and foreign distributors). Costs include costs incurred in production. Expenses include all exploration costs that are not capitalized.
- b) **Transport and logistics:** This segment includes sales revenue and costs associated with the transport and distribution of hydrocarbons and derivative products in operation.
- c) **Refining, petrochemicals and biofuels:** This segment mainly includes activities performed at the Barrancabermeja and Cartagena refineries, where crude oil from production fields is refined or processed. Additionally, this segment includes distribution of natural gas and LPG activities performed by Invercolsa Group. Revenues are derived from the sale of products to other segments and to domestic and foreign customers and include refined and petrochemical products at market prices and some fuels at regulated price. This segment also includes industrial service sales to customers.

See information by segments in Note 33.

5. New standards and regulatory changes

5.1 New standards adopted by the Group, effective as of January 1, 2020

Ecopetrol applied certain standards and amendments which were effective for annual periods beginning on or after January 1, 2020. Ecopetrol has not early adopted any other standard, interpretation or amendment that has been issued but is not yet effective.

- Amendments to IFRS 3 - Definition of a business: clarifies that to be considered a business, an integrated set of activities and assets must include, at a minimum, an input and a substantive process that, together, significantly contribute to the ability to create output. Furthermore, it clarifies that a business can exist without including all of the inputs and processes needed to create outputs.
- Amendments to IFRS 7, IFRS 9 and IAS 39 - Reference interest rate reform: a number of exemptions are provided, which apply to all hedging relationships directly affected by changes in the reference interest rate indexes. A hedging relationship is affected if the change in ratios creates uncertainty about the timing and/or amount of cash flows from the hedged item or hedging instrument.

These modifications have no impact on the consolidated financial statements, as there is currently no interest rate coverage.

- Amendments to IAS 1 and IAS 8 - Definition of material: The new definition establishes that, "Information is material if its omission or distortion is expected to influence the decisions made by the main users of financial statements". The amendments clarify that materiality will depend on the nature and/or magnitude of the information, either individually or in combination with other information, within the context of the financial statements. A misstatement of information is material if it can be reasonably expected to influence the decisions made by primary users.

These modifications have not had any impact on the consolidated financial statements.

- Revised Conceptual Framework for Financial Reporting: The IASB issued the revised Conceptual Framework in March 2018. It establishes a comprehensive set of concepts for financial reporting, standard setting, guidance for preparers in defining consistent accounting policies and assisting others to understand and interpret the standards. The Conceptual Framework includes several new concepts, provides updated definitions and recognition criteria for assets and liabilities, and clarifies some important concepts. Changes to the Conceptual Framework may affect the application of IFRS in situations where a standard does not apply to a particular transaction or event. For preparers developing accounting policies based on the Conceptual Framework, it is effective for annual periods beginning on or after January 1, 2020.

These modifications have not had an impact on the consolidated financial statements.

- Amendments to IFRS 16 Covid-19-related rental concessions: On May 28, 2020, the IASB issued the amendment to IFRS 16 - Covid-19-related rental concessions, which provides relief to tenants. As a practical solution, a tenant may choose not to assess whether a Covid-19-related rental concession from a landlord is a lease modification. A lessee who makes this choice accounts for any change in the lease payments resulting from the concession in the same way that it would account for the change under IFRS 16, if the change were not a modification of the lease. The amendment applies to annual reporting periods beginning on or after June 1, 2020. Early application is allowed.

This amendment was not applied given that the number of contracts that would be within its scope is reduced and – evaluating its impact at the business group level – it is not material. Consequently, each company will guarantee that the changes in the lease contracts under IFRS 16 comply with the current guidelines of the standard, which establishes that the modifications are recorded as a higher or lower value of the asset in use.

5.2 New standards issued by the IASB that will enter into force in future periods

The new amended standards and interpretations that are issued, but not yet effective, up to the date of issuance of the Group's financial statements are disclosed below. Ecopetrol intends to adopt these new and amended standards and interpretations, if applicable, when they become effective.

Effective January 1, 2021:

- Reform to the reference interest rate - Phase 2: The amendments address issues that might affect financial reporting as a result of the reform of an interest rate benchmark, including the effects of changes to contractual cash flows or hedging relationships arising from the replacement of an interest rate benchmark with an alternative benchmark rate. The amendments provide practical relief from certain requirements in IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 relating to: (i) changes in the basis for determining contractual cash flows of financial assets, financial liabilities and lease liabilities; and (ii) hedge accounting.

Within the accounting analysis, Ecopetrol established that the contractual cash flows of financial assets or financial liabilities measured at amortized cost would change as a result of the interest rate reform. According to the standard, the contracts that change the basis for determining the contractual flows as a result of the interest rate reform should not have a recalculation in the IRR and therefore no accounting impact on the Income Statement applying paragraph B5.4.5 of IFRS 9. Monthly financial expenses will be measured at the new interest rate without implying a remeasurement in the rate that may affect the current cost of the financial asset and/or liability.

Effective as of January 1, 2022 with early adoption in 2021:

- IAS 16 - Property, plant and equipment: amendment which prohibits entities deducting from the cost of an item of property, plant and equipment, any proceeds from selling items produced while bringing that asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Instead, an entity recognizes the proceeds from selling such items, and the costs of producing those items, in profit or loss.

The amendment is effective for annual reporting periods beginning on or after 1 January 2022 and must be applied retrospectively to items of property, plant and equipment made available for use on or after the beginning of the earliest period presented when the entity first applies the amendment.

Ecopetrol will apply the amendment with early adoption in 2021 subject to approval by decree as required in Colombia regulation.

- IFRS 3 - Business combinations: in which they update a reference from the standard to the Conceptual Framework.
- IAS 37 - Provisions, contingent liabilities and contingent assets: to specify which costs an entity needs to include when assessing whether a contract is onerous or loss-making.

Entry into force as of January 1, 2022 or later periods:

- 2018 - 2020 annual improvement cycle that involves adjustments to IFRS 1, IFRS 9, IAS 41 and IFRS 16.

The Company constantly monitors the new accounting standards, updates or amendments that the IASB issues, to validate their application and impacts on the Financial Statements.

6. Cash and cash equivalents

	2020	2019
Banks	4,215,518	5,813,306
Short-term investments (1)	866,606	1,262,105
Cash	184	347
	<u>5,082,308</u>	<u>7,075,758</u>

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(1) During the second quarter of 2020, resources were invested in funds in dollars as part of the issuance and placement of external public debt bonds carried out by Ecopetrol in April.

As of December 31, 2020, cash and cash equivalents balance included COP\$11,682 (COP\$85,286 as of December 31, 2019), of restricted cash to be used exclusively for the payment of loans principal and interest obtained by Oleoducto Bicentenario and Oleoducto de los Llanos. The use of short-term financial investments depends on the liquidity needs of the Ecopetrol Business Group.

The fair value of cash and cash equivalents approximates their book value due to their short-term nature.

The return on cash and cash equivalents for the years ended December 31, 2020 and 2019 were 2.2% and 3.2%, respectively.

The following table reflects the credit quality of issuers of investments included in cash and cash equivalents:

Rating	2020	2019
AAA	2,578,090	3,851,656
F1+	1,286,310	244,547
A-1	851,394	1,244,462
F1	207,773	-
BRC1+	99,923	673,342
AAAf	28,552	-
F3	12,184	-
A	4,319	167,404
BRC1	2,336	-
AAAmf	2,162	-
Aaa	1,431	-
AA	546	229,473
BBB	121	569,514
AA-	22	-
A-2	-	89,996
BB	-	43
Baa2	-	10
Other	7,145	5,311
	5,082,308	7,075,758

See credit risk policy in Note 30.7.

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7. Trade and other receivables, net

	2020	2019
Current		
Customers		
Foreign	2,021,070	2,759,993
Domestic	1,913,106	2,015,517
Fuel price stabilization fund (1)	319,927	256,303
Related parties (Note 31)	105,048	27,449
Accounts receivable from employees	97,723	95,693
Industrial services	39,651	47,691
Other (2)	322,567	497,688
	4,819,092	5,700,334
Non-current		
Accounts receivable from employees	474,693	508,588
Domestic customers	51,955	52,819
Related parties (Note 31)	-	93,657
Other (2)	149,959	131,732
	676,607	786,796

- (1) Corresponds to the application of Colombian Resolution 180522 of March 29, 2010 and other regulations that modify and add to it (Decree 1880 of 2014 and Decree 1068 of 2015), which establish the procedure to recognize the subsidy for refiners and importers of current motor gasoline and diesel, and the methodology for calculating the net position (the value arising from the differences between the parity price and the regulated price, which can be positive or negative). During 2020, the Group paid COP\$208,074 from the stabilization fund as follows: Ecopetrol COP\$50,131 and Reficar COP\$157,943 for the fourth quarter 2019 and the first half of 2020. For the second half of 2020, the fuel price stabilization fund represented an account receivable for the Group.
- (2) It mainly corresponds to crude oil loan agreements for transportation systems.

The book value of trade and other receivables approximates their fair value.

The changes in the allowance for doubtful accounts for the year ended December 31, 2020, 2019 and 2018 are as follows:

	2020	2019	2018
Opening balance	282,791	268,654	170,016
Additions, net	16,253	14,158	107,725
Effect of change of control in subsidiaries (Note 28)	(5,517)	-	-
Accounts receivable write-off and uses	(2,383)	(21)	(9,087)
Closing balance	291,144	282,791	268,654

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8. Inventories, net

	2020	2019
Crude oil	1,719,426	1,965,022
Fuels and petrochemicals	1,407,297	1,876,247
Materials for the production of goods	1,927,237	1,816,830
	5,053,960	5,658,099

The following are the changes of the allowances for losses for the years ended December 31, 2020, 2019 and 2018:

	2020	2019	2018
Opening balance	(131,526)	(86,938)	(194,507)
(Additions) reversals, net	(9,748)	(44,191)	115,778
Foreign currency translation	(122)	371	(9,717)
Effect of change of control in subsidiaries (Note 28)	20,075	-	-
Uses, transfers and reclassifications (1)	11,772	(768)	1,508
Closing balance	(109,549)	(131,526)	(86,938)

(1) It mainly includes the update of the provision in joint operations.

Crude oil, fuel and petrochemicals inventories are adjusted to the lowest between the cost and the net realizable value, as a result of fluctuations in international crude oil prices. The amount recorded for this in 2020 was COP\$9,017 (2019 - COP\$9,759).

9. Other financial assets

	2020	2019
Assets measured at fair value through profit or loss		
Investment Portfolio – Local currency	474,535	1,630,149
Investment Portfolio – Foreign currency	2,494,124	3,340,908
	2,968,659	4,971,057
Assets measured at fair value through other comprehensive income	732	-
Assets measured at amortized cost	3,391	3,367
Hedging instruments	98,877	4,868
	3,071,659	4,979,292
Current	2,194,651	1,624,018
Non-current	877,008	3,355,274
	3,071,659	4,979,292

The average return of the investment portfolio in Colombian pesos and U.S. dollars were approximately 5.6% (2019 – 5.4%) and approximately 2.3% (2019 – 3.6%), respectively.

Changes in fair value are recognized in financial results (Note 28).

9.1 Restrictions

As of December 31, 2020 and 2019, there were no investments with restricted use.

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9.2 Maturity

	2020	2019
Up to 1 year	2,194,651	1,624,018
1 – 2 years	101,216	983,571
2 – 5 years	573,420	1,791,549
> 5 years	202,372	580,154
	3,071,659	4,979,292

9.3 Fair value

The following is the balance of other financial assets by fair value hierarchy level as of December 31, 2020 and 2019:

	2020	2019
Level 1	5,273	472,547
Level 2	3,062,995	4,503,378
	3,068,268	4,975,925

There were no transfers between hierarchy levels for the years ended December 31, 2020 and 2019.

The securities comprising Group's portfolio are valued on a daily basis according to the instructions issued by the Financial Superintendence of Colombia. To this end, the information provided by authorized entities is used, which includes data from active markets. For cases in which market data is not available, other directly or indirectly observable data is used.

For U.S. dollar-denominated investments, fair value is based on information released by Bloomberg, while for investments denominated in Colombian pesos, fair value is provided by Precia, an entity authorized by the Financial Superintendence of Colombia to provide this service.

Within the investment valuation hierarchy process, other relevant aspects are taken into account, such as the issuer's rating, investment rating and the risk analysis of the issuer performed by the Ecopetrol Business Group.

9.4 Credit rating

The following table reflects the credit quality of the issuers of other financial assets measured at fair value through profit or loss:

	2020	2019
A-1	1,107,777	-
BBB-	758,472	-
F1+	551,626	350,325
AAA	353,939	2,707,019
A-3	127,861	-
A+	60,692	712,934
F1	43,839	-
AA-	21,263	186,325
A	21,179	186,222
AA	7,759	477,423
AA+	5,332	155,012
A1	-	18,168
BBB	-	159,968
Rating not available	876	-
Other	11,044	25,896
	3,071,659	4,979,292

See credit risk policy in Note 30.8.

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10. Taxes

10.1 Current and Non-current tax assets and liabilities

	2020	2019
Current tax assets		
Income tax (1)	1,823,027	190,605
Credit tax balance (2)	1,311,693	614,005
Other taxes (3)	841,575	714,197
	3,976,295	1,518,807
Non-current tax assets		
Deferred tax assets	7,673,912	6,809,347
Income tax credits (4)	397,821	-
	8,071,733	6,809,347
Current tax liabilities		
Income tax payable (5)	811,197	1,967,353
Industry and commerce tax	161,813	195,776
National tax and surcharge on gasoline	137,710	145,569
Carbon tax	64,091	54,586
Value added tax	5,607	33,098
Other taxes (6)	63,465	174,397
	1,243,883	2,570,779
Non-current tax liabilities		
Deferred tax liabilities	1,639,206	1,328,831
Income tax payable (7)	226,848	70,543
	1,866,054	1,399,374

(1) Given the payment for self-withholdings during the year, credit for foreign tax paid, credit for 50% of the industry and commerce paid, and VAT credit for acquisition of real productive fixed assets, a favorable balance is generated for the term.

(2) Corresponds mainly to the Ecopetrol's value added tax (VAT) and industry and commerce tax in favour.

(3) Includes the VAT credit derived from the acquisition of real productive fixed assets, following Article 95 of Law 2010 of 2019 and municipal advance payments and self-withholdings.

(4) Corresponds to the effective VAT credit paid on the acquisition of real productive fixed assets, which, given the limitations established by law, will be used in future income tax returns.

(5) In addition to the income tax recognized as a current liability, it includes the short-term portion of the liability of "works for taxes" related to Ecopetrol and Cenit, the income tax payment mechanism for 2017, established in Law 1819 of 2016 for COP\$94,185 and COP\$39,379 respectively.

(6) It mainly includes royalties, transport tax among others.

(7) The advance payment mechanism of "works for taxes" is regulated by article 238 of Law 1819 of 2016 - Tax reform, which established it as a form of payment in respect of income tax payable for the years 2017, 2018 and 2019. In compliance therewith, in May 2018, 2019 and 2020, the Group's companies recognized an asset and a liability for the value of the projects designated for each fiscal year.

10.2 Income tax

In accordance with Law 2010/2019 (Tax Reform) the tax provisions applicable to individual companies in Colombia for the taxable year 2020 are the following:

- The income tax rate applicable to national companies and foreign entities will be 32% for the year 2020, 31% for the year 2021 and 30% for the year 2022 and subsequent years.
- For the years 2019 and 2020, the presumptive income rate will be 1.5% and 0.5%, respectively, of the taxpayer's net equity from the immediately previous year. From 2021 the applicable tax rate will be 0%.
- The income tax for tax free trade zone users will be 20%. If the company located in the free zone has a Legal Stability Agreement (hereinafter LSA), the income tax rate will continue to be 15% during the term of said contract. This is the case of Refinería de Cartagena S.A.S. ("Reficar") and Esentia Masterbatch Ltda. ("Esentia MB").
- For fiscal year 2020, the Group had subsidiaries that were subject to a 32% income tax rate, subsidiaries located in free trade zones that were subject to a 15% income tax rate depending upon whether or not they complied with the LSA rules and other subsidiaries that were subject to statutory income tax rates applicable in countries where they are incorporated.
- The tax depreciation percentages are adjusted based on the table established in Law 1819 of 2016. On the other hand, oil investments amortization will be calculated based on the technical production units as it is recorded for accounting purposes.
- The cost of acquisition of exploration rights, geology and geophysics (G&G), exploratory drilling, among others, is capitalized for tax purposes until the technical and commercial feasibilities of extracting the resource are achieved.
- Tax losses generated as of January 1, 2017 may be offset against ordinary net income obtained in the following 12 taxable years.
- Following the Article 290 of Law 1819 of 2016, any excess between estimated income reported and CREE that has not yet been offset may be offset in accordance to the formula provided for this purpose in said article and subject to the term established in Article 189 of the Colombian Tax Code.

Statute of limitations of tax returns

By general rule, the statute of limitations for the income tax return corresponds to 3 years counted as from the due date to file the return or the filing date, when these have been lately filed. Returns filed by taxpayers that have made transactions, subject to the transfer pricing regulations, have a five-year statute of limitations, for the tax returns that are filed as of January 1, 2020.

For tax returns with favorable balances, the statute of limitations will be 3 years as of the filing date of the request for refunds or offsetting.

For tax returns in which tax losses are carried forward, the statute of limitations will be 6 years (5 years from 2020) counted as of their filing date.

With respect to tax returns where tax losses are calculated, the statute of limitations will be 12 years and if the losses are carried forward within the last 2 years of the 12-year period, the statute of limitations will be extended up to 3 additional years from the year of offsetting.

The income tax returns of the taxable years 2011, 2012, 2014, 2015, 2016, 2017, 2018 and 2019 and income tax for equality - CREE - of the taxable years 2014, 2015, and 2016 of Group Companies are subject to acceptance and review by the tax authorities.

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Income tax expense

	2020	2019	2018
Current income tax (1)	2,861,606	7,117,040	7,539,093
Deferred income tax (2)	(791,824)	(2,365,108)	783,136
Adjustments to prior years' current and deferred tax	(31,121)	(33,519)	(63,744)
Income tax expenses	2,038,661	4,718,413	8,258,485

- (1) The variation mainly corresponds to the difference between the bases for determining the tax (COP\$4,776,521 in 2020 and COP\$19,723,568 in 2019), due to the decrease of the profit.
- (2) Includes COP\$383,346 of tax related to the acquisition Chevron's stake in the Guajira Association contract (Note 12). Additionally, the deferred tax from tax losses, presumptive income excesses, asset retirement obligation update, among others. This tax was calculated on temporary differences, using the current tax rates at the time of recovery or use.

Reconciliation of the income tax expenses

The reconciliation between the income tax expense and the current tax applicable to the Ecopetrol Business Group in Colombia is as follows:

	2020	2019	2018
Net income before income tax	4,776,514	19,723,568	20,613,875
Statutory rate	32.0%	33.0%	37.0%
Income tax at statutory rate	1,528,484	6,508,777	7,627,134
Effective tax rate reconciliation items:			
Non-deductible expenses	289,043	295,550	379,633
Reversal of deferred tax recognized in prior years	245,508	-	-
Rate differential adjustment	14,974	132,888	172,352
Impairment of non-current assets	-	57,646	(128,461)
Variation in equity accounting method in Invercolsa	7,002	(2,943)	-
Non-taxable income (1)	(35,471)	(524,658)	(119,963)
Prior years' taxes (2)	(50,159)	(33,519)	(63,744)
Foreign currency translation and exchange difference	59,852	(54,319)	751,210
Tax discounts and tax credit	(20,572)	(110,857)	-
Ecopetrol U.S.A. adjustment income tax (3)	-	(1,550,152)	-
Effect of tax reform	-	-	(359,676)
Income tax calculated	2,038,661	4,718,413	8,258,485
Effective tax rate	42.7%	23.9%	40.1%
Current	2,583,832	7,127,492	7,416,038
Deferred (4)	(545,171)	(2,409,079)	842,447
	2,038,661	4,718,413	8,258,485

- (1) It includes mainly the non-taxable dividends.
- (2) It includes the update effect of 2020 deferred tax compared to 2019 for COP\$19,038.
- (3) In 2019, two companies, Ecopetrol USA Inc. and Ecopetrol Permian, were incorporated in the United States for the development of the unconventional hydrocarbons business. US tax regulations business reorganizations (IRC Section 368 (a) (1) (F)) makes it possible to offset tax losses occurring in previous years with future income tax returns. Because the results of Ecopetrol America LLC and Ecopetrol Permian LLC will be consolidated into Ecopetrol USA Inc.'s financial statements, it will be responsible for the payment of taxes in the United States. The International Accounting Standard - IAS 12 establishes when a company has strong evidence that will allow it to offset the tax losses, it is possible to calculate a deferred tax asset. Additionally, the tax projections with the entry into operation of Ecopetrol Permian, allow to infer that it will generate enough income to recover the losses of previous years, therefore the recognition of deferred tax asset is feasible.
- (4) Includes COP\$383,346 that corresponds to deferred tax liability of Guajira association (Note 12).

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The effective tax rate as of December 31, 2020, is 42.7% (2019 - 23.9%). The increase from the previous year is mainly due to: a) the decrease in projected profit at the end of each year, b) the limitation in the use of the tax credits, c) the effect of the adjustment for exchange differences in the companies of the business group that are dollar functional currency, d) the effect of the adjustment of Permian in 2019 and e) the effect of the companies of the group with losses that have a nominal rate different from the parent company.

Deferred income tax

	2020	2019
Deferred tax assets	7,673,912	6,809,347
Deferred tax liabilities	(1,639,206)	(1,328,831)
Net deferred income tax	6,034,706	5,480,516

The detail of deferred tax assets and liabilities is as follows:

	2020	2019
Deferred tax assets (liabilities)		
Loss carry forwards (1)	4,478,606	2,550,816
Provisions (2)	3,187,850	2,404,032
Employee benefits (3)	1,874,242	1,875,872
Accounts payable (4)	(10,626)	711,503
Loans and borrowings	846,019	920,203
Accounts receivable	183,843	139,410
Excess presumptive income	61,722	298,273
Other	47,269	(15,189)
Goodwill (5)	(366,346)	(363,968)
Property plant and equipment and Natural and environmental resources (6)	(4,267,873)	(3,040,436)
	6,034,706	5,480,516

- (1) In 2020, a deferred tax asset for tax losses carryforwards was recognized in the following companies: Ecopetrol USA Inc. (COP\$1,663,411), Refinería de Cartagena (COP\$1,601,570) and Ecopetrol S.A. (COP\$1,189,973).
- (2) Corresponds to non-deductible accounting provisions, mainly the asset retirement obligation (ARO) provision.
- (3) Actuarial calculations for health, pensions and bonds, education and other long-term benefits to employees.
- (4) The variation corresponds to the change in the methodology for the deferred tax in the estimated liabilities.
- (5) According to Colombian tax law, goodwill is subject to amortization, while under IFRS it is not amortized but such goodwill is subject to impairment tests, and any difference results in a deferred tax liability.
- (6) For tax purposes, natural and environmental resources and property, plant and equipment have a useful life and a methodology for calculating depreciation and amortization different from those determined under international accounting standards. This item includes the amount of the capital gains of 10% tax rate applicable to the lands. The main variation is related to the income tax rate variation from 31% to 30%.

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Deferred tax details are as follows:

	Loss carry forwards	Provisions	Employee benefits	Accounts payable	Loans and borrowings	Excess presumptive income
As of December 31, 2018	1,002,062	1,994,762	1,161,860	365,646	827,452	(37,638)
Profit or loss	1,548,754	409,270	(57,343)	345,857	92,751	335,911
OCI	-	-	771,355	-	-	-
As of December 31, 2019	2,550,816	2,404,032	1,875,872	711,503	920,203	298,273
Profit or loss	1,927,790	783,818	39,608	(722,129)	(74,184)	(236,551)
Increase due to business combinations (Guajira association)	-	-	-	-	-	-
OCI	-	-	(41,238)	-	-	-
As of December 31, 2020	4,478,606	3,187,850	1,874,242	(10,626)	846,019	61,722

	PPE and Natural resources	Goodwill	Accounts receivable	Others	Total
As of December 31, 2018	(2,304,140)	(404,394)	79,591	(143,717)	2,541,484
Profit or loss	(736,296)	40,426	59,819	341,053	2,380,202
OCI	-	-	-	(114,520)	656,835
Increase in shareholding in Invercolsa	-	-	-	(98,005)	(98,005)
As of December 31, 2019	(3,040,436)	(363,968)	139,410	(15,189)	5,480,516
Profit or loss	(844,091)	(2,378)	44,433	(68,306)	848,010
Increase due to business combinations (Guajira association – Note 12)	(383,346)	-	-	-	(383,346)
OCI	-	-	-	130,764	89,526
As of December 31, 2020	(4,267,873)	(366,346)	183,843	47,269	6,034,706

Deferred tax assets recognized

Deferred tax assets recognized in the consolidated financial statements as of December 31, 2020 and 2019 amounted to COP\$7,673,912 and COP\$6,809,347, respectively and is mainly comprised of the items included in detail of deferred tax assets and liabilities.

Deferred tax assets for tax loss carryforwards and excesses of presumptive income tax amounted to COP\$4,540,328 and COP\$2,849,087 as of December 31, 2020 and 2019 respectively, and is mainly comprised of:

- Tax losses carryforwards that do not expire corresponding to Refinería de Cartagena (COP\$8,007,852) and Ecopetrol USA (USD \$404 million - COP\$1,386,730), amount to COP\$9,394,582 (2019 - COP\$6,385,989) that generates deferred taxes of COP\$1,601,570 (2019 - COP\$1,052,848), and COP\$306,172 (2019 - COP\$182,977), respectively.
- Tax losses carryforwards that expire in 20 years from the year in which they were incurred corresponding to Ecopetrol USA amounting to COP\$6,532,048 (2019 - COP\$6,144,400) (USD \$1,904 million) and correspond to deferred tax assets of COP\$1,357,239 (2019 - COP\$1,288,249).
- Tax losses carryforwards that expire in the following 12 years counted as from the year they were incurred corresponding to Ecopetrol S.A. amounting to COP\$3,953,551 resulting in a deferred tax assets of COP\$1,189,973.

Additionally, as of December 31, 2020 the excess of presumptive income amounted to COP\$199,103 resulting in a deferred tax asset of COP\$61,722 in Ecopetrol S.A.

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The Ecopetrol Business Group recognizes deferred tax assets to the extent that it is probable that they will be realized against available sources of income, including projections of future taxable income. In accordance to the tax rules regulation applicable until December 31, 2016, excess of presumptive income and excess minimum base excesses before 2017 incurred in the income tax and income tax for equity equality - (CREE, as its acronym in Spanish) respectively, may be offset with the ordinary taxable income in the following five (5) years, using for this purpose, the formula established in numeral 6th, of Article 290 of Law 1819/2016.

The tax loss carryforwards of Ecopetrol USA generated between 2008 and 2017, expire in 20 years from the year in which they were incurred. The tax loss carryforwards generated starting January 1, 2018 have no expiration date and its use is limited to 80% of taxable income.

The movements of deferred income tax for the years as of December 31, 2020, 2019 and 2018 are as follows:

	2020	2019	2018
Opening balance	5,480,516	2,541,484	2,682,881
Deferred tax recognized in profit or loss	928,517	2,409,079	(842,447)
Increase due to business combination	(383,346)	(98,005)	-
Deferred tax recognized in other comprehensive income (a)	89,526	656,835	666,767
Foreign currency translation	(80,507)	(28,877)	34,283
Closing balance	6,034,706	5,480,516	2,541,484

(a) The following is the detail of the income tax recorded in other comprehensive income:

	Pre-tax	Deferred tax	After tax
December 31. 2020			
Actuarial valuation gains (losses) (Note 22.1)	(137,459)	41,238	(96,221)
Cash flow hedging for future crude oil exports (Note 30.3)	(1,186)	1,908	722
Hedge of a net investment in a foreign operation (Note 30.4)	520,490	(156,147)	364,343
Hedge with derivative instruments	(78,547)	23,475	(55,072)
	303,298	(89,526)	213,772
December 31. 2019			
Actuarial valuation gains (losses) (Note 22.1)	2,571,184	(771,355)	1,799,829
Cash flow hedging for future crude oil exports (Note 30.3)	(356,339)	118,008	(238,331)
Hedge of a net investment in a foreign operation (Note 30.4)	87,524	(26,257)	61,267
Hedge with derivatives instruments	(69,220)	22,769	(46,451)
	2,233,149	(656,835)	1,576,314
December 31. 2018			
Actuarial valuation gains (losses) (Note 22.1)	(29,249)	33,539	4,290
Cash flow hedging for future crude oil exports (Note 30.3)	797,658	(264,284)	533,374
Hedge of a net investment in a foreign operation (Note 30.4)	1,382,278	(410,324)	971,954
Hedge with derivatives instruments	77,872	(25,698)	52,174
	2,228,559	(666,767)	1,561,792

Deferred tax assets not recognized

Deferred tax assets related to the tax loss carryforwards incurred by the subsidiaries Andean Chemicals Ltd and Ecopetrol Costa Afuera S.A.S. in the amount of COP\$1,912 and COP\$71,305, respectively, excess of presumptive income of Hocol Petroleum Company, and Reficar in the amount of COP\$245,508, were not recognized, as the Management considered that it is not probable that these deferred tax assets will be recoverable in the foreseeable future.

If the Ecopetrol Business Group had recognized this deferred tax asset, the profit for the year ending December 31, 2020 would have increased by COP\$247,420.

Deferred tax assets (liabilities) not recognized

As of December 31, 2020, by application of the exception indicated in IAS 12, paragraph 39, the deferred tax asset was not recognized on the difference between the accounting and tax basis associated with investments in Ecopetrol subsidiaries and joint ventures (Base: COP\$812,673 - Tax: COP\$81,267).

Income tax provisions and contingent liabilities

The income tax returns for taxable years 2011, 2012, 2014, 2015, 2016, 2017, 2018 and 2019 and CREE tax returns for taxable years 2014, 2015, and 2016 of Group companies are subject to acceptance and review by part of the tax authorities. The management of the Group companies considers that the amounts recorded as tax liabilities are sufficient and are supported by current regulations, doctrine and jurisprudence to address any claim that may be established with respect to such years.

Uncertain tax positions - IFRIC 23

Ecopetrol Business Group's strategy is to avoid making aggressive tax decisions that may cause questioning of its tax returns, by tax authorities.

Regarding uncertain tax positions where it has been determined that there may be a possible controversy with the tax authority that could result in an income tax increase, a success threshold has been established by IFRIC 23, which has been calculated based on current regulations and tax opinion provided by our tax advisors.

In accordance with the aforementioned interpretation, the Ecopetrol Business Group considers that uncertain tax positions include in its determination of income tax will not affect the results if it is probable that the position will be accepted by the tax authorities. Notwithstanding, the Ecopetrol Business Group will continue to monitor new tax regulations and ruling issued by the tax authority and other entities.

10.2.1. Dividend taxes

Dividends related to profits generated from the year ended December 31, 2017; dividends will be subject to withholding at a rate of 10% for 2020 (7.5% in 2019). Further, if the earnings against which the dividends are distributed were not subject to corporate tax, these dividends are taxable by the income tax applicable during the distribution period (for 2019 the rate is 33%). In this scenario, the 7.5% tax on dividends will be applicable to the distributed amount, once it is reduced by the 32% in 2020 (33% in 2019) income tax rate.

The non-taxed dividends that the Company will receive will not be subject to withholding tax due to the express provision of the regulation that establishes the dividends that are distributed within the business groups duly registered with the Chamber of Commerce and decentralized entities; they will not be subject to withholding tax for this concept.

10.2.2. Transfer prices

According to the Colombian tax law, income taxpayers who enter into transactions with related parties or related parties located in foreign jurisdictions and in free trade zones or with residents located in jurisdictions considered tax havens, are obliged to determine their ordinary and extraordinary income for purposes of the income tax, its costs and deductions, considering for these operations the arm's length principle.

Ecopetrol filed in 2020 its transfer pricing informative return for the 2019 taxable year, and its corresponding supporting documentation, as well as the country-by-country report and the master file for the same year, following the current tax law.

For fiscal year 2020, related-party transactions in foreign jurisdictions, as well as the business conditions under which said operations were carried out and the general structure did not vary significantly with respect to the previous year. For this reason, these transactions were carried out in accordance with the arm's length principle. It is estimated that there will be no need for adjustments derived from the analysis of transfer prices for 2020, which imply changes in the income provision of the taxable year 2020.

10.2.3. Value Added Tax (VAT)

Law 2010/2019 established that VAT paid on the import, creation, construction or acquisition of real productive fixed assets, may be treated as a tax credit for income tax purposes. This VAT cannot be assumed simultaneously as a cost or expense in the income tax and is not allowed to be discounted from the VAT return.

10.2.4. Tax reform

The Government issued the Law 2010/2019, which makes numerous changes to the Colombian tax rules. The Tax Reform reduces the corporate income tax (CIT) rate from 33% in 2019 to 32% for 2020, 31% for 2021 and 30% for 2022 and onwards.

The presumptive income tax rate (i.e., an alternative tax based on a percentage of the net equity of the last year) is reduced from 1.5% to 0.5% in 2020 and 0% for 2021 and onwards.

The thin capitalization rule ratio is modified from 3:1 (which includes all debt that generates interest with local and foreign entities, related or unrelated) to a 2:1 ratio that only considers debt transactions involving related local and foreign parties (including back-to-back transactions involving foreign third parties).

Tax on dividends

As of January 1, 2020, the Tax Reform establishes a 7.5% dividend tax on distributions between Colombian companies. The tax will be charged only on the first distribution of dividends between Colombian entities and may be credited against the dividend tax due once the ultimate Colombian company makes a distribution to its shareholders (nonresident shareholders (entities or individuals) or to Colombian individual residents). The dividend tax on local distributions does not apply if the Colombian companies are part of a registered economic group, or the distribution is to a Colombian entity qualifying for the new Colombian holding company (CHC) regime.

Normalization tax

The Tax Reform establishes a tax amnesty to “normalize” (i) unreported assets; or (ii) nonexistent liabilities that were included on a tax return. The amnesty will apply only for 2020 (September 25, 2020 is the due date for filing the normalization tax). The applicable tax rate is 15% of the value of the unreported assets or nonexistent liabilities.

Value Added Tax

Law 2010 of 2019 established that VAT paid on the import, construction or acquisition of real productive fixed assets may be deducted from taxable income. This VAT cannot be reported simultaneously as a cost and expense in the income tax return nor will it be discounted from the sales tax.

Concerning VAT, changes have been made to the list of goods and services excluded from VAT as set forth in Articles 424, 426 and 476 of the Tax Code, adding Article 437 to the Tax Code, with regard to guidelines on compliance with formal duties concerning VAT by service providers abroad, and it has been noted that VAT withholding may be up to 50% of the tax amount, subject to regulation by the National Government. The VAT rate remains at 19%.

Tax procedures

With regards to procedure, changes have been made: (i) withholding tax returns which, being considered ineffective, will be enforceable, (ii) electronic notification of administrative acts; (iii) payment of the entire amount covered by a statement for objections to avoid late interest at the current rate plus two points; and (iv) elimination of the extension of the status of limitations to three (3) additional years due to tax losses offset and (v) a five-year status of limitations for those taxpayers who must comply with the transfer pricing regime.

Additionally, an audit benefit was included for fiscal years 2020 to 2021. Under this benefit, the income tax returns that reflect an increase in the net income tax of at least 30%, or 20% over the net income tax of the immediately preceding year, shall be considered firm for six (6) or twelve (12) months, respectively after the date of presentation if not notified of a deadline for correction or special requirement, or a special deadline or provisional settlement, provided that the return is filed timely and the payment is made within the established deadlines.

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The above benefit does not apply to: (i) taxpayers who have access to tax benefits due to their location in a specified geographic region; (ii) if it is demonstrated that the withholding taxes reported are non-existent; (iii) if the net income tax is less than 71 UVT (COP\$2,5 for fiscal year 2020). The reduced status of limitation stated is not applicable for withholding tax returns and VAT returns, which shall follow the general tax rules.

11. Other assets

	2020	2019
Current		
Partners in joint operations (1)	534,145	921,983
Advanced payments to contractors and suppliers	503,698	360,781
Prepaid expenses	369,979	272,007
Trust funds (2)	218,158	144,798
Related parties (Note 31)	7,093	57,016
Other assets	30,963	22,393
	1,664,036	1,778,978
Non-current		
Abandonment and pension funds (3)	405,376	445,457
Trust funds (4)	338,067	171,008
Employee benefits	221,658	220,998
Advanced payments and deposits	54,392	56,027
Judicial deposits and attachments	42,672	40,317
Other assets	27,949	8,674
	1,090,114	942,481

(1) Corresponds to the net amount of cash calls and cutbacks generated in relation to the operations carried out with partners through Exploration and Production (E&P) contracts, Technical Evaluations (TEA) contracts and agreements entered in to with the National Hydrocarbons Agency (ANH), as well as through association contracts and other types of contracts.

(2) It mainly includes the deposits related to Guajira Association's abandonment fund.

(3) Mainly corresponds to Ecopetrol's share in trusts established to support costs of abandonment of wells and dismantling of facilities, as well as the payment of future retirement pensions in some association contracts.

(4) Mainly includes the resources invested in fiduciary commissions destined to "works for taxes", mechanism of payment of the income tax of 2019 and 2020, constituted in compliance with article 238 of Law 1819 of 2016 - Tax reform.

12. Business combinations

12.1 Additional interest in Invercolsa

On November 29, 2019, Ecopetrol acquired an additional interest of 8.53% in Invercolsa (See Note 2.2 Basis of consolidation) obtaining control of Invercolsa and resulting in a total ownership interest of 51.88%.

In 2020 Ecopetrol finalized the fair value of separately identified assets and liabilities acquired, that resulted in an adjustment of COP\$434,357 from Property, Plant and Equipment and Natural Resources to Goodwill (Note 19).

12.2 Guajira association contract

On November 22, 2019, Hocol S.A. – a 100% subsidiary of Ecopetrol Corporate Group – signed a Purchase Agreement and Sale of Assets with “Chevron” in order to acquire the entire stake owned by the latter in the Guajira Association (43% of the association contract) and its position as operator. The remaining 57% stake in this association belongs to Ecopetrol S.A. The transaction was subject to the approval of the Superintendence of Industry and Commerce (SIC), which was made official on April 2, 2020, through resolution 12785/2020. As established in the agreement, the start of the operation by Hocol would be the first business day of the month following the date of this approval, i.e. May 1, 2020. Therefore, this is the acquisition date for accounting recognition purposes.

The transaction price was determined based on a fixed reference value as of January 1, 2019 plus or minus price adjustments that relied directly on variables associated with the Guajira asset between January 1, 2019 and May 1, 2020. The clauses of the purchase agreement indicate that there is a 180-day term to finish adjusting the differences arising from the movement on the assets acquired and the liabilities assumed. During the review and approval process to determine the final price, Chevron and Hocol signed an agreement to extend the deadline for the closing of the transaction, which is expected to end during the first half of 2021. These deadlines are in regulatory compliance.

Ecopetrol and Hocol measured the assets acquired and the liabilities assumed in proportion to their participation in accordance with the provisions of IFRS 11 - Joint agreements and IFRS 3 - Business combinations.

For Ecopetrol, this transaction is configured as an acquisition in stages. Fair value was determined using the income approach applying the discounted cash flow methodology. The fair values of property, plant and equipment, natural and environmental resources and deferred tax have been determined based on the information available and following the guidelines of IFRS 3. Therefore, they may have adjustments associated with working capital, in compliance with the clauses of the purchase agreement and the guidelines defined in IFRS 3.

The table below summarizes the amounts recognized for the assets acquired and the liabilities assumed at the acquisition date:

	Ecopetrol	Hocol	Total
Assets			
Accounts receivable	-	19,545	19,545
Property, plant and equipment	829,121	361,426	1,190,547
Natural resources	615,642	214,852	830,494
Right-of-use asset	-	206	206
Other assets (1)	113,107	145,660	258,767
	1,557,870	741,689	2,299,559
Liabilities			
Accounts payable	(585)	(20,342)	(20,927)
Deferred tax	(383,346)	(38,611)	(421,957)
Provisions	(37,798)	(34,234)	(72,032)
Other liabilities (2)	(34,455)	(102,487)	(136,942)
	(456,184)	(195,674)	(651,858)
Fair value of net assets	1,101,686	546,015	1,647,701

(1) The other assets mainly include the abandonment fund.

(2) The other liabilities mainly include the abandonment and pension obligations and customer advances.

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The effect on operating results as of December 31, 2020 is summarized below:

	Ecopetrol	Hocol	Total
Fair value of the net assets	1,101,686	546,015	1,647,701
Book value of net assets	(200,660)	-	(200,660)
Consideration paid	-	(454,630)	(454,630)
Foreign currency translation	-	(5,359)	(5,359)
(=) Net profit from the acquisition	901,026	86,026	987,052
Recognized in:			
Property, plant and equipment (Note 14)	720,670	361,426	1,082,096
Natural and environmental resources (Note 15)	563,546	214,852	778,398
Intangibles (Note 17)	156	-	156
Accounts receivable	-	19,545	19,545
Right-of-use asset	-	206	206
Other assets	-	145,660	145,660
Accounts payable	-	(20,342)	(20,342)
Deferred tax	-	(38,611)	(38,611)
Provisions	-	(34,234)	(34,234)
Other liabilities	-	(102,487)	(102,487)
Consideration paid	-	(454,630)	(454,630)
Foreign currency translation	-	(5,359)	(5,359)
Subtotal	1,284,372	86,026	1,370,398
Profit on acquisition before deferred tax (Note 28)	1,284,372	86,026	1,370,398
(-) Deferred tax expense (Note 10)	(383,346)	-	(383,346)
Net profit from the acquisition after deferred tax	901,026	86,026	987,052

Costs related to the acquisition of \$19,898 million were excluded from the pre-existing participation and were recognized as operating expenses in the period.

Effects on the Ecopetrol Group's results

Ecopetrol Group's income includes COP\$238,955 related to the acquisition of the Guajira association, while the profit for the year increased by COP\$161,423.

If this business combination took place on January 1, 2020, the Group's income would have an amount of COP\$50,308,407, while the profit for the year would be COP\$2,766,398. Management considers that these figures represent an approximate measure of the performance on an annualized basis and provide a benchmark for comparison for future periods.

In determining the Group's anticipated income and profits, if the Guajira association had been acquired at the beginning of the current reporting period, management would have calculated the depreciation of property, plant and equipment and natural resources acquired on the basis of its fair value in the initial recognition for the business combination instead of the carrying amounts recognized in the financial statements prior to the acquisition.

13. Investments in associates and joint ventures

The details on the participations, economic activity, address, area of operations and financial information of the investments in joint ventures and associates can be found in Exhibit 1.

13.1 Composition and movements

	2020	2019
Investment in joint ventures		
Equion Energía Limited	1,642,735	1,515,067
Offshore International Group	613,258	709,871
Ecodiesel Colombia S.A.	51,672	46,095
	2,307,665	2,271,033
Less impairment:		
Equion Energía Limited	(314,460)	(322,388)
Offshore International Group (1)	(609,826)	(530,330)
	1,383,379	1,418,315
Investments in associates		
Gases del Caribe S.A. E.S.P.	1,512,629	1,527,911
Gas Natural del Oriente S.A. E.S.P.	143,893	166,685
Gases de la Guajira S.A. E.S.P.	69,518	68,608
E2 Energía Eficiente S.A. E.S.P.	35,614	28,501
Extrucol S.A.	26,996	32,847
Sociedad Colombiana de Servicios Portuarios S.A. - Serviport S.A.	8,541	11,070
Sociedad Portuaria Olefinas y Derivados	2,599	2,205
	1,799,790	1,837,827
Less impairment: Serviport S.A.	(8,541)	(11,070)
	1,791,249	1,826,757
	3,174,628	3,245,072

(1) The movement includes COP\$2,527 related to foreign currency translation, recognized in Equity.

The following is the movement of investments in associates and joint ventures:

For the year ended December 31, 2020:

	Associates	Joint ventures	Total
Opening balance	1,826,757	1,418,315	3,245,072
Effects of equity method through:			
Profit or loss	114,779	(38,443)	76,336
Other comprehensive income	(2,923)	-	(2,923)
Dividends declared (1)	(148,665)	(9,017)	(157,682)
Impairment reversal (loss) (Note 18)	2,529	(69,041)	(66,512)
Foreign currency translation	(1,228)	81,565	80,337
Closing balance	1,791,249	1,383,379	3,174,628

(1) During 2020, the Group received dividends of COP\$157,241 (2019 - COP\$189,169) from its investments.

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For the year ended December 31, 2019:

	Associates	Joint ventures	Total
Opening balance	244,662	1,599,674	1,844,336
Effects of equity method through:			
Profit or loss	109,538	257,366	366,904
Other comprehensive income	(174,991)	4,531	(170,460)
Dividends declared	(75,674)	(4,192)	(79,866)
Impairment reversal (loss) (Note 18)	142	(318,962)	(318,820)
Foreign currency translation and other movements (1)	1,723,080	(120,102)	1,602,978
Closing balance	1,826,757	1,418,315	3,245,072

(1) Invercolsa S.A. became a subsidiary as of November 29, 2019, thus the direct investments of Invercolsa in Gases del Caribe S.A. E.S.P., Gas Natural del Oriente S.A. E.S.P., Gases de la Guajira S.A. E.S.P., Extrucol S.A., E2 Energía Eficiente S.A. E.S.P., became direct investments of the Group as of the consolidation.

For the year ended December 31, 2018:

	Associates	Joint ventures	Total
Opening balance	225,178	1,105,282	1,330,460
Effects of equity method through:			
Profit or loss	105,908	59,928	165,836
Other comprehensive income	1,731	135,831	137,562
Dividends declared	(86,847)	(3,503)	(90,350)
Impairment (loss) reversal (Note 18)	(1,308)	302,136	300,828
Closing balance	244,662	1,599,674	1,844,336

13.2 Additional information about associates and joint ventures

The following is the breakdown of assets, liabilities and results of the two main investments in associates and joint ventures, Equion Energía Limited and the Offshore International Group, as of December 31, 2020 and 2019:

	2020		2019	
	Equion Energía Limited	Offshore International Group	Equion Energía Limited	Offshore International Group
Statement of financial position				
Current assets	2,616,813	266,240	2,530,453	284,591
Non-current assets	13,538	1,302,555	95,384	1,481,680
Total assets	2,630,351	1,568,795	2,625,837	1,766,271
Current liabilities	81,259	154,086	315,002	310,561
Non-current liabilities	49,773	871,089	76,768	718,863
Total liabilities	131,032	1,025,175	391,770	1,029,424
Equity	2,499,319	543,620	2,234,067	736,847
Other complementary information				
Cash and cash equivalents	36,601	110,622	188,820	48,752

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	2020		2019		2018	
	Equion Energia Limited	Offshore International Group	Equion Energia Limited	Offshore International Group	Equion Energia Limited	Offshore International Group
Statement of profit or loss						
Sales revenue	257,066	325,812	1,285,891	529,167	1,490,177	653,054
Costs	(127,672)	(364,750)	(671,179)	(690,484)	(755,656)	(585,192)
Other operating income						
(expenses), net	60,852	(234,597)	(624)	(64,115)	29,136	(353,010)
Financial (expenses)						
income	(1,090)	(24,034)	(3,660)	(31,288)	(3,659)	(21,227)
Income tax	(45,137)	59,818	(214,048)	208,473	(338,487)	(16,594)
Financial year results	144,019	(237,751)	396,380	(48,247)	421,511	(322,969)
Other comprehensive results	1,223,990	-	1,102,757	—	1,095,090	—

**Other complementary
information**

Depreciation and amortization	41,536	205,243	404,482	226,654	511,615	243,601
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This is a reconciliation of equity of the significant investments and the carrying amount of investments as of December 31:

	2020		2019	
	Equion Energia Limited	Offshore International Group	Equion Energia Limited	Offshore International Group
Equity of the joint venture	2,499,319	543,620	2,234,067	736,847
% of Ecopetrol's ownership	51%	50%	51%	50%
Ecopetrol's ownership	1,274,654	271,811	1,139,374	368,424
Additional value of the investment	375,693	341,447	375,693	341,447
Impairment	(314,460)	(609,826)	(322,388)	(530,330)
Unrealized gain	(7,612)	-	-	-
Carrying amount of the investment	1,328,275	3,432	1,192,679	179,541

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14. Property, plant and equipment

	Plant and equipment	Pipelines, networks and lines	Work in progress(1)	Buildings	Lands	Other	Total
Cost							
Balance as of December 31, 2019	47,995,471	36,370,647	6,259,654	8,157,945	4,054,538	2,660,232	105,498,487
Additions/capitalizations (1)	1,625,316	1,179,602	1,573,469	390,731	18,705	244,494	5,032,317
Increase in abandonment costs (Note 23)	181,318	15,035	-	3,885	-	3,126	203,364
Capitalized financial interests (2)	42,052	31,511	38,756	14,965	753	8,324	136,361
Exchange differences capitalized	1,338	1,002	1,233	476	24	265	4,338
Disposals	(491,677)	(84,184)	(79,077)	(16,390)	(10,155)	(85,785)	(767,268)
Effect of control loss in subsidiaries (3)	(298,570)	(592,885)	(775)	(266,526)	(60,341)	(144,189)	(1,363,286)
Adjustment on fair value for business combination (Note 12)	547,965	44,538	-	54,413	-	73,754	720,670
Foreign currency translation	1,336,351	478,103	19,804	59,107	73,181	29,876	1,996,422
Transfers (4)	149,217	(301,675)	(298,836)	13,863	36,121	(97,636)	(498,946)
Balance as of December 31, 2020	51,088,781	37,141,694	7,514,228	8,412,469	4,112,826	2,692,461	110,962,459
Accumulated depreciation and impairment losses							
Balance as of December 31, 2019	(19,035,642)	(16,635,110)	(1,114,366)	(3,456,254)	(80,682)	(961,611)	(41,283,665)
Depreciation expense	(2,296,176)	(1,634,545)	-	(341,052)	-	(113,207)	(4,384,980)
Reversal (loss) of an impairment (Note 18)	(368,754)	329,743	(327,751)	(18,074)	8,799	(8,601)	(384,638)
Disposals	443,259	75,150	3,492	14,279	11	82,310	618,501
Effect of control loss in subsidiaries (3)	266,825	403,095	262	221,708	30,669	108,081	1,030,640
Foreign currency translation	(306,506)	(155,927)	959	(13,707)	3,403	(9,738)	(481,516)
Transfers/reclassifications	40,125	59,570	413,948	(35,624)	(40,748)	(5,734)	431,537
Balance as of December 31, 2020	(21,256,869)	(17,558,024)	(1,023,456)	(3,628,724)	(78,548)	(908,500)	(44,454,121)
Net balance as of December 31, 2019	28,959,829	19,735,537	5,145,288	4,701,691	3,973,856	1,698,621	64,214,822
Net balance as of December 31, 2020	29,831,912	19,583,670	6,490,772	4,783,745	4,034,278	1,783,961	66,508,338

(1) Includes capitalizations for the acquisition of Guajira association by Hocol for a value of COP\$361,426 (See Note 12).

(2) Financial interests are capitalized based on the weighted average rate of borrowing costs. See Note 20 - Loans and borrowings.

(3) See effects of control loss in subsidiaries in Note 28.

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Cost	Plant and equipment	Pipelines, networks and lines	Work in Progress (1)	Buildings	Lands	Other	Total
Balance as of December 31, 2018	46,474,369	34,349,283	4,624,703	7,852,278	3,984,576	2,845,802	100,131,011
Additions / capitalizations	804,570	765,994	2,097,378	243,039	20,098	81,580	4,012,659
Increase by business combinations	123,436	1,118,178	44,876	9,062	22,924	20,471	1,338,947
Increase in abandonment costs	148,764	102,402	-	1,248	-	4,337	256,751
Capitalized financial interests (2)	77,627	32,630	12,831	15,800	1,033	2,389	142,310
Exchange differences capitalized	4,208	1,769	696	857	56	130	7,716
Disposals	(500,876)	(165,936)	(78,399)	(24,050)	(354)	(71,309)	(840,924)
Foreign currency translation	244,666	84,357	2,691	10,757	12,869	6,369	361,709
Transfers	618,707	81,970	(445,122)	48,954	13,336	(229,537)	88,308
Balance as of December 31, 2019	47,995,471	36,370,647	6,259,654	8,157,945	4,054,538	2,660,232	105,498,487
<u>Accumulated depreciation and impairment losses</u>							
Balance as of December 31, 2018	(17,985,416)	(14,777,790)	(497,441)	(3,122,523)	(34,302)	(913,556)	(37,331,028)
Depreciation expense	(2,001,116)	(1,634,783)	-	(326,512)	-	(122,153)	(4,084,564)
Reversal (loss) of an impairment (Note 18)	519,835	(113,860)	(626,878)	(87,338)	(35,533)	(29,349)	(373,123)
Disposals	481,384	116,769	-	17,807	-	91,541	707,501
Foreign currency translation	(103,365)	(36,341)	-	(3,656)	-	(3,323)	(146,685)
Transfers/reclassifications	53,036	(189,105)	9,953	65,968	(10,847)	15,229	(55,766)
Balance as of December 31, 2019	(19,035,642)	(16,635,110)	(1,114,366)	(3,456,254)	(80,682)	(961,611)	(41,283,665)
Net balance as of December 31, 2018	28,488,953	19,571,493	4,127,262	4,729,755	3,950,274	1,932,246	62,799,983
Net balance as of December 31, 2019	28,959,829	19,735,537	5,145,288	4,701,691	3,973,856	1,698,621	64,214,822

(1) The balance of work in progress as of December 31, 2019 include mainly: Modernization of the Barranca and Cartagena refineries, Castilla facilities and works in the Colombian Petroleum Institute (ICP, by its acronym in Spanish).

(2) Financial interests are capitalized based on the weighted average rate of borrowing costs. See Note 20 - Loans and borrowings.

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15. Natural and environmental resources

	Oil investments	Asset retirement cost	Exploration and evaluation	Total
Cost				
Balance as of December 31, 2019	59,822,566	5,036,884	8,362,719	73,222,169
Additions/capitalizations (1)	3,659,270	123,446	2,211,746	5,994,462
Increase in abandonment costs (Note 23)	-	2,075,992	28,097	2,104,089
Disposals	(1,806)	260	(223,805)	(225,351)
Withdrawal of exploratory assets and dry wells (2)	-	-	(448,132)	(448,132)
Capitalized financial interests	111,140	-	-	111,140
Exchange differences capitalized	3,535	-	-	3,535
Adjustment at fair value for business combinations (Note 12)	563,546	-	-	563,546
Foreign currency translation	440,978	23,353	(138,809)	325,522
Transfers	768,049	(28,084)	(923,922)	(183,957)
Balance as of December 31, 2020	65,367,278	7,231,851	8,867,894	81,467,023
Accumulated amortization and impairment losses				
Balance as of December 31, 2019	(41,993,097)	(2,156,274)	-	(44,149,371)
Depletion expense	(3,810,349)	(831,909)	-	(4,642,258)
Reversal (loss) of impairment (Note 18)	116,403	-	(334,112)	(217,709)
Disposals	213	(40)	93,975	94,148
Foreign currency translation	(310,894)	(14,546)	-	(325,440)
Transfers	(108,423)	21,320	(205,131)	(292,234)
Balance as of December 31, 2020	(46,106,147)	(2,981,449)	(445,268)	(49,532,864)
Net balance as of December 31, 2019	17,829,469	2,880,610	8,362,719	29,072,798
Net balance as of December 31, 2020	19,261,131	4,250,402	8,422,626	31,934,159

(1) Includes capitalizations for the acquisition of Guajira association by Hocol for a value of COP\$214,852 (See Note 12).

(2) Includes dry wells: 1) Ecopetrol: Nafta 1, Caronte, Alqamari, Boranda Sur and Coyote; 2) Hocol: Obiwan and 3) Ecopetrol Brasil: a well of Saturno. Additionally, exploration costs of Ecopetrol America are included.

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	Oil investments	Asset retirement cost	Exploration and evaluation	Total
Cost				
Balance as of December 31, 2018	53,936,041	2,919,146	4,806,000	61,661,187
Additions/capitalizations (1)	5,144,295	166,431	4,487,467	9,798,193
Increase (decrease) in abandonment costs	5,703	1,965,309	(38,835)	1,932,177
Disposals	(84,052)	(9,253)	(142,127)	(235,432)
Withdrawal of exploratory assets and dry wells (2)	—	—	(340,271)	(340,271)
Capitalized financial interests (3)	94,995	—	10,834	105,829
Exchange differences capitalized	5,150	—	587	5,737
Foreign currency translation	68,793	(3,004)	(112,917)	(47,128)
Transfers	651,641	(1,745)	(308,019)	341,877
Balance as of December 31, 2019	59,822,566	5,036,884	8,362,719	73,222,169
Accumulated amortization and impairment losses				
Balance as of December 31, 2018	(36,806,667)	(1,779,070)	—	(38,585,737)
Depletion expense	(3,836,479)	(383,360)	—	(4,219,839)
Impairment loss (Note 18)	(1,017,061)	—	—	(1,017,061)
Disposals	83,667	8,511	—	92,178
Foreign currency translation	(61,862)	(2,256)	—	(64,118)
Transfers	(354,695)	(99)	—	(354,794)
Balance as of December 31, 2019	(41,993,097)	(2,156,274)	—	(44,149,371)
Net balance as of December 31, 2018	17,129,374	1,140,076	4,806,000	23,075,450
Net balance as of December 31, 2019	17,829,469	2,880,610	8,362,719	29,072,798

(1) The main capitalizations correspond to the development of assets in the Permian basin.

(2) Includes dry wells: 1) Ecopetrol: Tibirita, Provenza 1, La Cira 7000 and Ávila 1; 2) Ecopetrol America LLC: Warrior and Molerusa and 3) Hocol: Mamey West and Venganza Oeste.

(3) Borrowing costs are capitalized at the weighted average rate of borrowing costs. See Note 20 - Loans and borrowings.

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Accounting for suspended exploratory wells

The following table shows the classification by age, from the completion date, of the exploratory wells that are suspended as of December 31, 2020, 2019 and 2018:

	2020	2019	2018
Between 1 and 3 years (a)	-	361,700	496,871
Between 3 and 5 years (b)	319,368	132,021	375,371
More than 5 years (c)	589,604	441,389	273,764
Total suspended exploratory wells	908,972	935,110	1,146,006
Number of projects exceeding 1 year	16	30	24
Wells under 1 year of suspension	-	—	9,511

- (a) As of December 2019, suspended exploratory wells correspond to Ecopetrol: Caronte, Purple Angel and Gorgon. As of December 2018, suspended exploratory wells correspond to Ecopetrol: Purple Angel, Caronte and discovery wells of Ecopetrol America Inc: Warrior 1.
- (b) For 2020, the balance corresponds mainly to wells of Ecopetrol: Purple Angel and Gorgon. For 2019, the balance corresponds mainly to wells of Ecopetrol S.A.: Luna-1 and Gala 1K and discovery wells of Ecopetrol America Inc: Warrior 1. For 2018, the balance corresponds mainly to wells of Ecopetrol S.A.: Orca1, Tiribita 1A and Tiribita 3, which are under evaluation.
- (c) Correspond mainly to i) Ecopetrol S.A.: Orca 1, Luna-1 and Gala 1K, which are under evaluation; and ii) Offshore International Group, temporarily abandoned for future production plans.

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16. Right-of-use assets

The following is the movement of right-of-use assets for the years ended December 31, 2020 and 2019:

	Lands and buildings	Plant and equipment	Vehicles	Right-of-use assets	Subleases	Lease liabilities
Balance as of December 31, 2019	218,513	97,264	140,448	456,225	29,436	1,290,954
Additions	41,303	14,618	32,582	88,503	-	88,503
Amortization of the period	(52,200)	(29,038)	(98,726)	(179,964)	-	-
Remeasurements	(41,907)	33,686	69,255	61,034	-	76,799
Impairment loss	312	29,718	5,844	35,874	-	-
Disposals	(13,343)	(4,321)	-	(17,664)	-	(28,916)
Effect of control loss in subsidiaries	(61,044)	(7,432)	-	(68,476)	(29,436)	(102,671)
Finance cost	-	-	-	-	-	64,988
Repayment of borrowings and interests	-	-	-	-	-	(350,539)
Exchange difference	1,838	(556)	1,072	2,354	-	16,080
Balance as of December 31, 2020	93,472	133,939	150,475	377,886	-	1,055,198

(1) See effects of control loss in subsidiaries in Note 28.

	Lands and buildings	Plant and equipment	Vehicles	Right-of-use assets	Subleases	Lease liabilities
Balance as of December 31, 2018	-	-	-	-	-	797,889
IFRS 16 implementation (January 1st)	236,519	78,412	145,704	460,635	29,610	490,245
Additions	26,252	123,341	74,900	224,493	-	224,493
Amortization of the period	(43,759)	(66,831)	(64,764)	(175,354)	-	-
Impairment loss (Note 18)	(495)	(37,601)	(15,392)	(53,488)	-	-
Disposals	(4)	(57)	-	(61)	-	(50)
Finance cost	-	-	-	-	3,302	76,139
Repayment of borrowings and interests	-	-	-	-	(3,476)	(300,326)
Exchange difference	-	-	-	-	-	2,564
Balance as of December 31, 2019	218,513	97,264	140,448	456,225	29,436	1,290,954

17. Intangible assets

The following is the movement of intangibles and their amortization and impairment for the years ended December 31, 2020 and 2019:

	Licenses and software	Other intangibles	Total
Cost			
Balance as of December 31, 2019	994,599	285,247	1,279,846
Acquisitions	43,817	46,265	90,082
Foreign currency translation	12,569	5,072	17,641
Effect of control loss in subsidiaries (Note 28)	(10,584)	-	(10,584)
Disposals	(5,430)	-	(5,430)
Adjustment on fair value for business combination (Note 12)	156	-	156
Transfers	30,892	64,174	95,066
Balance as of December 31, 2020	1,066,019	400,758	1,466,777
Accumulated amortization			
Balance as of December 31, 2019	(692,217)	(104,531)	(796,748)
Amortization of the period	(93,907)	(23,429)	(117,336)
Recovery -losses for impairment (Note 18)	(176)	5	(171)
Disposals	5,558	11	5,569
Effect of control loss in subsidiaries (Note 28)	9,877	-	9,877
Foreign currency translation	(8,689)	(65)	(8,754)
Transfers	(2,116)	(2,055)	(4,171)
Balance as of December 31, 2020	(781,670)	(130,064)	(911,734)
Net balance as of December 31, 2019	302,382	180,716	483,098
Net balance as of December 31, 2020	284,349	270,694	555,043
Useful life	<5 years	<7 years	

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	Licenses and software	Other intangibles	Total
Cost			
Balance as of December 31, 2018	1,015,720	197,283	1,213,003
Acquisitions	48,064	120,225	168,289
Disposals	(114,187)	(1,041)	(115,228)
Foreign currency translation	3,477	(3,946)	(469)
Exchange differences capitalized	—	(14)	(14)
Transfers	41,525	(27,260)	14,265
Balance as of December 31, 2019	994,599	285,247	1,279,846
Accumulated amortization			
Balance as of December 31, 2018	(712,329)	(89,927)	(802,256)
Amortization of the period	(88,044)	(14,982)	(103,026)
Reversal of impairment loss (Note 18)	53	2	55
Disposals	114,143	1,041	115,184
Foreign currency translation	(2,333)	(33)	(2,366)
Transfers/reclassifications	(3,707)	(632)	(4,339)
Balance as of December 31, 2019	(692,217)	(104,531)	(796,748)
Net balance as of December 31, 2018	303,391	107,356	410,747
Net balance as of December 31, 2019	302,382	180,716	483,098
Useful life	<5 years	<7 years	

18. Impairment of non-current assets

As mentioned in Note 4.12, each year the Ecopetrol Business Group assesses whether there is an indication that an asset or cash-generating unit may be impaired or if impairment losses recognized in previous periods should be reversed (except for goodwill impairment losses).

The Impairment of non-current assets includes property, plant and equipment and natural resources, investments in companies, goodwill and other non-current assets. The Ecopetrol Business Group is exposed to future risks derived mainly from variations in: (i) the estimate of future oil prices, (ii) refining margins and profitability, (iii) cost profile, (iv) investments and maintenance expenses, (v) amounts of recoverable reserves, (vi) market and country risk assessments reflected in the discount rate and (vii) changes in domestic and international regulations, among others.

Any changes in the above estimates used to calculate the recoverable amount of a non-current assets can have a material impact on the recognition impairment losses or reversals (other than goodwill impairment losses) in the profit or loss. Highly sensitive significant estimates affecting each business segments, among others include: (i) in the exploration and production segment, variations of recoverable hydrocarbon estimates, changes in projected realization prices and the discount rate; (ii) in the refining segment, changes in finished products and crude oil prices, the discount rate, refining margins, changes in environmental regulations, cost structure and the level of capital expenditures; and (iii) in the transport and logistics segment, changes in regulated tariffs and transported volumes.

As described in Note 2.8, the 2020 Covid-19 pandemic generated a significant impact on the world's economy and consequently on the oil industry – hand in hand with significant volatility in the financial and commodity markets of all the world. This situation has been improving in recent months, as a result of the reopening of different sectors of the economy and the advancement of vaccination programs.

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Based on the impairment tests conducted by the Ecopetrol Business Group, the following are the impairment or reversals for the years ended on December 31, 2020, 2019 and 2018:

Impairment (loss) reversal by segment	2020	2019	2018
Exploration and Production	(192,693)	(1,982,044)	785,940
Refining and Petrochemicals	(781,528)	452,163	(984,704)
Transport and Logistics	341,065	(232,556)	(169,870)
	(633,156)	(1,762,437)	(368,634)
Recognized in:			
Property, plant and equipment (Note 14)	(384,638)	(373,123)	(1,083,285)
Natural resources (Note 15)	(217,709)	(1,017,061)	414,102
Investment in joint ventures and associates (Note 13)	(66,512)	(318,820)	300,828
Right of use assets (Note 16)	35,874	(53,488)	-
Intangibles (Note 17)	(171)	55	(279)
	(633,156)	(1,762,437)	(368,634)

18.1 Exploration and production

The impairment reversal of assets of the Exploration and Production segment for the years ended December 31 of 2020, 2019 and 2018 is the following:

	2020	2019	2018
Oilfields	(123,652)	(1,663,082)	483,803
Investment in joint ventures	(69,041)	(318,962)	302,136
Other	—	—	1
	(192,693)	(1,982,044)	785,940

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18.1.1 Oilfields

An impairment expense was recognized in the year 2020 as a result of the current economic context of the hydrocarbons sector, the behavior of market variables, price differentials versus the reference to Brent, technical and operational information available. This impairment was mainly recognized in fields that operate in Colombia: Occidente B, Sur, Teca, Tibú, La Hocha and Espinal, and in the field K2 abroad. In addition, a recovery was recognized in: Casabe, as a consequence of a significant increase in its reserves, as well as Provincia, Lisama and Orito.

In 2019, as a result of the current hydrocarbons sector's economic context, the behavior of the market variables, Ecopetrol's crude oil basket price discounts as compared to the ICE Brent crude price, available technical and operational information, there was an impairment loss in the oilfields that operate in Colombia mainly Tibú, Casabe, Provincia, Underriver, La Hocha y Andalucía and the oilfield operated abroad K2.

In 2018, based on new market variables, incorporation of new reserves, Ecopetrol's crude oil basket price discounts as compared to the ICE Brent crude price, available technical and operational information, there was a partial reversal of an impairment recognized in previous years for the oil fields that operate in Colombia Casabe, Provincia, Underriver, Tisquirama and Orito and in fields operated abroad Gunflint and K2, and an impairment mainly in Tibú and Dina Norte fields.

The following is the breakdown of oilfields impairment losses or reversals for the years ended December 31, 2020, 2019 and 2018:

2020

Cash generating units	Carrying amount	Recoverable amount	Impairment (loss) reversal
Oil fields in Colombia			
Reversal	24,845,238	61,224,928	1,019,395
Loss	2,439,799	1,423,561	(1,016,238)
Fields operated abroad			
Loss	1,277,609	1,150,800	(126,809)
			(123,652)

2019

Cash generating units	Carrying amount	Recoverable amount	Impairment (loss) reversal
Oil fields in Colombia			
Reversal	3,842,819	6,047,345	74,577
Loss	4,992,462	3,322,284	(1,673,258)
Fields operated abroad			
Reversal	200,910	539,785	4,391
Loss	68,792	—	(68,792)
			(1,663,082)

2018

Cash generating units	Carrying amount	Recoverable amount	Impairment (loss) reversal
Oil fields in Colombia			
Reversal	19,156,326	50,462,080	689,665
Loss	764,808	405,421	(359,387)
Fields operated abroad			
Reversal	1,810,618	2,719,086	157,709
Loss	184,375	180,191	(4,184)
			483,803

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The grouping of assets to determine the CGUs is consistent as compared to the prior periods.

The assumptions used to determine the recoverable amount include the following:

- The fair value less costs of disposal of the Exploration and Production segment assets was determined based on cash flows after tax derived from the business plans approved by Group's management, which are developed based on long-term macroeconomic policies and fundamental assumptions of supply and demand. The fair value hierarchy is 3.
- Balance of oil and gas reserves, in addition to proven reserves; probable and possible reserves were also considered (See Note 34), adjusted by different risk factors.
- The real discount rate (after tax) determined as the average weighted cost of capital (WACC) and it corresponds to 3.67% (2019 - 6.31% and 2018–7.46%).
- Oil price – Brent: the forecasts include USD\$46.36/barrel for the first year, USD\$57.00/barrel for the medium term and USD\$67.77/barrel for the long term. In 2019, the assumptions taken USD\$55.61/barrel for the first year, USD\$56.50/barrel for the medium term and USD\$71.6/barrel as of the year 2030. In 2018, the assumptions taken USD\$81.4/barrel for 2018, USD\$67.6/barrel average for the next six years and USD\$71.4/barrel as of 2030. International oil price projections were carried out by an independent agency specializing in oil and gas, taking into account the current scenarios of oil quota agreements of the OPEC (Organization of Petroleum Exporting Countries) and the impact of the changes in specifications issued by the international agreement to prevent pollution by ships (Marpol) as of the year 2020 on crude and fuels with high sulfur content.

18.1.2 Investments in joint ventures

Investments in joint ventures in the Exploration and Production segment are recorded using the equity method of accounting. Ecopetrol evaluates if there is any objective evidence that indicate that the fair value of such investments has deteriorated in the period, especially those for which goodwill has been recorded.

As a result, Ecopetrol recognized an (impairment loss) or reversal of impairment on the carrying value as of December 31, as follows:

	2020	2019	2018
Equion Energía Limited	7,928	(134,753)	108,791
Offshore International Group	(76,969)	(184,209)	193,345
	(69,041)	(318,962)	302,136

The significant assumptions used to determine the recoverable amount of these investments are consistent with those described in the previous section, except for the use of a discount rate in real terms in 2020 for Offshore International Group of 5.79% (2019-8.50% and 2018 – 8.92%).

There was a recovery in 2020 on the investment in Equion mainly originated by the update of the transport rates through pipelines where Ecopetrol has a shareholding, and an impairment loss was recorded on the investment in Offshore International Group considering the fair value of the sale transaction.

In 2019, an impairment loss for both. Offshore International Group and Equion Energía Limited was recorded, due to current market variables, decreasing international crude oil prices, conservative position over projects and increasing costs.

In 2018, the market showed an improvement in the crude oil and gas production forecast. Operational performance and technical evolution have contributed to strengthening future cash flows that, in turn, contributed to the reversal of the impairment charged recognized in previous years for Offshore International Group and Equion Energy.

18.2 Refining and Petrochemical

The following is the Cash Generating Units impairment or reversals in the refining and petrochemical segment for the years ended December 31, 2020, 2019 and 2018:

2020

Cash-generating units	Carrying amount	Recoverable amount	Impairment loss
Refinería de Cartagena	24,041,174	23,600,649	(440,525)
Invercolsa S.A.	276	273	(3)
Refinería de Barrancabermeja (projects)	676,334	335,334	(341,000)
			<u>(781,528)</u>

2019

Cash-generating units	Carrying amount	Recoverable amount	Impairment (loss) reversal
Refinería de Cartagena	22,292,788	23,204,385	911,597
Bioenergy	575,331	340,991	(234,340)
Refinería de Barrancabermeja (projects)	901,517	676,423	(225,094)
			<u>452,163</u>

2018

Cash-generating units	Carrying amount	Recoverable amount	Impairment loss
Refinería de Cartagena	23,411,058	22,640,761	(770,297)
Bioenergy	774,343	560,882	(213,461)
Other	946	—	(946)
			<u>(984,704)</u>

The grouping of assets to determine the CGUs is consistent with prior periods.

18.2.1 Refinería de Cartagena

The recoverable amount of the Refinería de Cartagena was calculated based on its fair value less costs of disposal, which is higher than its value in continued use. The fair value less costs of disposal of the Refinería de Cartagena was determined based on cash flows after taxes that are derived from business plans approved by the Ecopetrol Business Group's management, which are developed based on market prices provided by a third-party expert, which considers long-term macroeconomic variables and fundamental supply and demand assumptions for crude oil and refined products. The fair value hierarchy is 3.

The significant assumptions to determine the recoverable amount included: (i) a gross refining margin determined by crude oil feedstock and products price outlook provided by an independent third-party expert; (ii) a real discount rate (after tax) of 5.10% (2019-6.23% and 2018-6.48%), determined under WACC methodology; (iii) current conditions or benefits, or similar, as an industrial user of goods and services of the free trade zone and during the validity of the license; (iv) level of costs and long-term operating expenses in line with international refinery standards of similar configuration and conversion capacity; (v) refinery throughput and production; and (vi) level of continued investment.

It is important to mention that the refining business is highly sensitive to the volatility of the margins and the macroeconomic variables implicit in the determination of the discount rate, therefore, any change in these assumptions could potentially result in significant variations in the determination of impairment losses or reversal amounts.

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The impairment expense for 2020 was mainly derived from lower refining margins associated with external factors associated with the COVID-19 pandemic. On the other hand, management endured operational improvements that compensate to a certain extent for the effects of macroeconomic variables.

The reversal of impairment recorded for 2019, is mainly related to macroeconomic assumptions changes which decreased the discount rate used to value the assets; this is explained by the decreasing risk and the Company's cost of the debt. Together, operational management and financial results allowed the support of operational improvements included in the forecast that compensate in some measure the effects related to the impact that the MARPOL regulation will have on the margins' forecast of refined products and the crude oil basket price discounts. The results of 2019 were impacted by a higher knowledge of the Refinery capabilities and efficient operational management.

The impairment recorded for 2018 is explained by: i) an adjustment in market expectations in relation to the impact that the implementation of the MARPOL regulation will have on margins of refined products, ii) the differential of light and heavy crudes that serve as raw material; and iii) fundamental macroeconomic changes that increased the discount rate used for the valuation of Reficar's assets, mainly associated with the increase in the risk-free rate and higher market risk premiums. Improvements in operational and commercial inputs associated to the refinery optimization as well as the tax effects of the "Tax reform" (tax reform) partially offset the effects of the macroeconomic variables.

18.2.2 Bioenergy

Starting June 24, 2020, Bioenergy entered the mandatory liquidation process. Therefore, as of this date the Group does not have control over Bioenergy and it is no longer a part of the consolidated figures.

An impairment expense was recorded in 2019 in the amount of \$234,340. This value was mainly generated by changes in operating variables, changes in the projection of operating flows and the need for greater resources, mainly due to the results of the renewal of older cane plantations. An impairment loss was observed in 2018 mainly due to the updating of the project entry dates, the stabilization process of the industrial plant and the updating of operating variables.

The recoverable amount of Bioenergy for 2019 and 2018 was calculated based on the fair value less the costs of disposal level, which is greater than the value in use and corresponds to the future cash flows discounted after taxes on profit. The fair value hierarchy is 3.

The significant assumptions used to determine the recoverable amount included: (a) forecast of ethanol prices based on projections made by Group specialists and (b) a 6.03% discount rate in real terms (2018 – 6.97%) determined under the WACC methodology.

18.2.3 Refinería de Barrancabermeja

An impairment expense of COP\$341,000 was recognized as of December 31, 2020 as a result of the update of the analysis for the Barrancabermeja Refinery Modernization Project, in relation to engineering work based on the evaluations carried out and the current context of the industry.

During 2019, a loss of COP\$225,094 was recorded, primarily related to engineered works for the integral development of the Refinería de Barrancabermeja Modernization Project, mainly due to the advance in the technical analysis of options to the eventual improvement of the conversion of the Refinery. Once the project is reactive, Ecopetrol will evaluate whether it could reverse any impairment loss recorded in the previous years.

During 2018, the Refinería de Barrancabermeja Modernization Project, which is currently suspended, was evaluated and there were no indications that implied the recognition of additional impairment.

18.3 Transport and Logistics

The recoverable amount of these assets was determined based on its fair value with costs of disposal, which corresponds to discounted cash flows based on the hydrocarbon production curves and refined products transport curves. The fair value hierarchy is 3.

The assumptions used in the model to determine the recoverable value included: i) the tariffs regulated by the Ministry of Mines and Energy and the Energy and Gas Regulation Commission - CREG, ii) the actual discount rate used in the valuation was 3.17% (2019 - 4.88% and 2018 - 5.60%) and iii) transport volume projections based on the end of year results for 2020 and the long-term volumetric transport program.

In 2020, Cenit recognized an impairment recovery of COP\$341,065, related to the South CGU, which includes Tumaco Port and the TransAndino Pipeline (OTA, by its acronym in Spanish) and the North CGU, which includes the section Banadia - Ayacucho, and it is part of the Caño Limón Pipeline, due to volumetric recovery and changes in tariffs. The fair value of these CGUs is COP\$7,049,007 and their book value is COP\$2,153,631.

In 2019, we recorded an impairment loss of COP\$232,556, mainly related to the cash-generating unit of the South COP\$106,983, by Puerto de Tumaco and the TransAndino Pipeline (OTA), which means an impairment loss of 100% of the book value; and the cash-generating unit of the North COP\$125,140; both include the right-of-use assets. This impairment loss was generated mainly by decreased volume transport to determine the income forecast and the lower efficiency costs.

In 2018, the main impairment recorded was COP\$167,917, corresponding to the systems of the Southern Cash Generating Unit (CGU), composed of the Tumaco Port and the TransAndino Pipeline (OTA) and its afferent pipelines, the Mansoyá - Orito Pipeline (OMO), San Miguel - Orito (OSO), and Churuyaco- Orito (OCHO). This value was generated mainly by a decrease in the volume projections for the southern systems, and an increase in the need for maintenance capex to reduce the operational risk of the transport systems.

19. Goodwill

	2020	2019
Oleoducto Central S.A.	683,496	683,496
Hocol Petroleum Ltd.	537,598	537,598
Invercolsa S.A. (1)	434,357	-
Andean Chemical Ltd	127,812	127,812
Propilco S.A.	108,137	108,137
	1,891,400	1,457,043
Less impairment Hocol Petroleum Ltd.	(297,121)	(297,121)
	1,594,279	1,159,922

(1) Corresponds to the value recognized by updating the fair value of Invercolsa S.A. (Note 12).

As of December 31, 2020 and 2019, the Ecopetrol Business Group assessed the recoverability of the carrying value of goodwill generated in the acquisition of subsidiaries. The recoverable amount was determined based on the realization value less costs of disposal using the present value of future cash flows for each of the companies acquired with goodwill. The source of information used the financial projections of each company derived from the business plans approved by management, which were developed based on long-term macroeconomic factors such as price curves and margins and fundamental assumptions of supply and demand. As a result of the analysis, the Ecopetrol Business Group did not recognize any goodwill impairment for these periods.

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20. Loans and borrowings

20.1 Composition of loans and borrowings

	Weighted average effective interest rate as of December 31		2020	2019
	2020	2019		
Local currency				
Bonds	6.4%	8.7%	1,084,461	1,567,598
Syndicated loan	5.6%	8.0%	811,079	1,115,874
Lease liabilities (1)	6.6%	7.2%	836,489	1,039,303
Commercial loan	6.3%	8.3%	312,408	737,032
			3,044,437	4,459,807
Foreign currency				
Bonds (2)	6.0%	5.9%	33,944,548	25,832,740
Commercial loan (3)	3.6%	4.1%	8,247,014	6,586,538
Loans from related parties (Note 31)	0.8%	2.4%	1,277,046	1,108,403
Lease liabilities (1)	6.1%	6.2%	218,709	251,651
			43,687,317	33,779,332
			46,731,754	38,239,139
Current			4,923,346	5,012,173
Non-current			41,808,408	33,226,966
			46,731,754	38,239,139

(1) Corresponds to present value of the payments to be made during the term of the operative lease contracts of pipelines, tanks, property and vehicles, recognized by the implementation of IFRS 16 - Leases.

(2) On April 29, 2020, Ecopetrol issued and placed external public debt bonds for an amount of USD\$2,000 million, with a 10-year term and a coupon rate of 6.875%.

(3) Includes contingent credit line for USD\$665 million with international banking (Scotiabank and Mizuho Bank).

In 2020, financial obligations were acquired for a total amount of COP\$13,805,403 (2019 – COP\$359,876 and 2018 – COP\$517,747) as part of the market risk mitigation strategy (Note 30).

20.2 Fair value of loans

The fair value of loans and borrowings is COP\$52,721,790 and COP\$43,261,792 as of December 31, 2020 and 2019, respectively.

For fair value measurement, local currency bonds were valued using Precia reference prices, while bonds in U.S. dollars were valued using Bloomberg. With regard to the other financial obligations for which there is no market benchmark, a discount to present value technique was used. These rates incorporate market risk through some benchmarks (Libor, FTD) and the Ecopetrol Business Group's credit risk (spread).

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20.3 Maturity of loans and borrowings

The following are the maturities of loans and borrowing as of December 31, 2020:

	Up to 1 year (1)	1 - 5 years	5-10 years	> 10 years	Total
Local currency					
Bonds	65,829	354,081	370,900	293,651	1,084,461
Syndicated loan	242,660	568,419	-	-	811,079
Financial leasing	167,059	418,938	211,233	39,259	836,489
Other	106,410	205,998	-	-	312,408
	581,958	1,547,436	582,133	332,910	3,044,437
Foreign currency					
Bonds	1,905,325	14,692,852	12,109,859	5,236,512	33,944,548
Commercial loans	1,098,593	6,563,863	584,558	-	8,247,014
Loans from related parties	1,277,046	-	-	-	1,277,046
Financial leasing	60,424	149,381	8,904	-	218,709
	4,341,388	21,406,096	12,703,321	5,236,512	43,687,317
	4,923,346	22,953,532	13,285,454	5,569,422	46,731,754

(1) Includes short-term credit and the current portion of long-term debt, as applicable.

The following are the maturities of loans and borrowing as of December 31, 2019:

	Up to 1 Year (1)	1 - 5 years	5-10 years	> 10 years	Total
Local currency					
Bonds	571,969	403,996	358,976	232,657	1,567,598
Syndicated loan	361,545	754,329	—	—	1,115,874
Financial leasing	179,448	559,337	235,791	64,727	1,039,303
Other	218,375	343,049	121,679	53,929	737,032
	1,331,337	2,060,711	716,446	351,313	4,459,807
Foreign currency					
Bonds	1,386,032	13,873,755	5,574,713	4,998,240	25,832,740
Commercial loans	1,129,117	4,163,624	1,253,446	40,351	6,586,538
Loans from related parties	1,108,403	—	—	—	1,108,403
Financial leasing	57,284	175,962	18,405	—	251,651
	3,680,836	18,213,341	6,846,564	5,038,591	33,779,332
	5,012,173	20,274,052	7,563,010	5,389,904	38,239,139

(1) Includes short-term credit and the current portion of long-term debt, as applicable.

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20.4 Breakdown by type of interest rate and currency

The following is the breakdown of loans and borrowing by type of interest rate as of December 31, 2020 and 2019:

	2020	2019
Local currency		
Fixed rate	523,870	598,802
Floating rate	2,520,567	3,861,005
	<u>3,044,437</u>	<u>4,459,807</u>
Foreign currency		
Fixed rate	38,706,328	31,087,439
Floating rate	4,980,989	2,691,893
	<u>43,687,317</u>	<u>33,779,332</u>
	<u><u>46,731,754</u></u>	<u><u>38,239,139</u></u>

The interest on the bonds in national currency is indexed to the CPI (Consumer Price Index) and bank loans and variable rate leasing in Colombian pesos are indexed to the DTF (Fixed Term Deposits) and IBR (Banking Reference Indicator), plus a differential. Interest on loans in foreign currency is calculated based on the LIBOR rate plus a spread and the interests of the other types of debt are at a fixed rate.

20.5 Loans designated as hedging instrument

As of December 31, 2020, Ecopetrol S.A. designated USD\$8,549 million (2019 – USD\$7,331 million) of foreign currency debt as a hedging instrument, of which USD\$7,249 million is used to hedge the net investment in foreign operations with the US dollar as their functional currency, and USD\$1,300 million is used to hedge the cash flows of future crude oil exports. See Note 30 – *Risk management*.

20.6 Guarantees and covenants

Financing obtained directly by Ecopetrol S.A. in capital markets has no guarantees granted or financial covenant restrictions.

The following is a summary of certain restrictions contained in certain other loan instruments of Ecopetrol Business Group. As of Dec 31, 2020 the covenants, loans and payments have been fulfilled.

- The loan entered into by Oleoducto de los Llanos was guaranteed with the economic rights of the ship-or-pay transportation agreements with Frontera Energy Corp and also includes certain restrictions regarding capital contributions and asset disposal. In August 2020, the payment of the last installment of the syndicated loan was made, thus ending the syndicated loan agreement signed with Grupo Aval.
- The syndicated loan entered into by Oleoducto Bicentenario requires that this subsidiary maintain an established relationship of leverage and solvency and cash flow / service to the debt.

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20.7 Movement of net financial debt

The following is the movement of net financial debt as of December 31, 2020, 2019 and 2018:

	Cash and equivalents	Other financial assets	Loans and borrowings	Net financial debt
Balance as of December 31, 2018	6,311,744	8,147,815	(38,062,645)	(23,603,086)
Cash flow	505,466	(3,117,549)	3,303,303	691,220
Exchange difference:				
Recognized in profit or loss	258,548	182,396	(151,518)	289,426
Recognized in other comprehensive income	-	-	(53,911)	(53,911)
Financial cost registered to projects	-	-	(261,592)	(261,592)
Financial income (expense) recognized in profit or loss	-	(18,551)	(1,894,490)	(1,913,041)
Foreign currency translation	-	(204,441)	(14,627)	(219,068)
Other movements that do not generate cash flow (1)	-	(10,378)	(1,103,659)	(1,114,037)
Balance as of December 31, 2019	7,075,758	4,979,292	(38,239,139)	(26,184,089)
Cash flow	(1,971,156)	(2,107,856)	(6,105,296)	(10,184,308)
Exchange difference:				
Recognized in profit or loss	(22,294)	38,701	747,744	764,151
Recognized in other comprehensive income	-	-	(722,458)	(722,458)
Financial cost registered to projects	-	-	(255,372)	(255,372)
Financial income (expense) recognized in profit or loss	-	43,948	(2,386,537)	(2,342,589)
Foreign currency translation	-	42,529	(175,885)	(133,356)
Effect of loss of control in subordinates	-	-	528,981	528,981
Other movements that do not generate cash flow	-	75,045	(123,792)	(48,747)
Balance as of December 31, 2020	5,082,308	3,071,659	(46,731,754)	(38,577,787)

(1) Corresponds mainly to the recognition of right-of-use assets and lease liabilities due to the initial adoption of IFRS 16 - Leases as of January 1, 2019.

21. Trade and other payables

	2020	2019
Suppliers	6,491,909	8,115,015
Partners' advances	497,898	925,761
Withholding tax	462,429	673,204
Insurance and reinsurance	240,803	136,041
Dividends payable (1)	223,571	157,181
Deposits received from third parties	85,545	44,826
Related parties (Note 31)	72,316	187,616
Agreements in transport contracts (2)	37,941	71,239
Hedging operations	6,405	-
Various creditors	351,288	402,808
	8,470,105	10,713,691
Current	8,449,041	10,689,246
Non - current	21,064	24,445
	8,470,105	10,713,691

(1) During 2020, the Group paid dividends to its shareholders in the amount of COP\$8,734,351 (2019 – COP\$13,867,029 and 2018 – COP\$4,427,701) net of withholdings when applicable.

(2) Corresponds to the value of the debt for agreements in the pipelines transportation contracts, calculated in the volumetric compensation for quality and other inventory management agreements.

The carrying amount of trade accounts and other accounts payable approximates their fair value due to their short-term nature.

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22. Provisions for employees' benefits

	2020	2019
Post-employment benefits		
Healthcare	7,193,527	6,908,799
Pension	2,819,985	2,853,718
Education	485,792	458,441
Bonds	342,669	352,917
Other plans	102,632	98,729
Termination benefits – Voluntary retirement plan (1)	713,407	124,186
	11,658,012	10,796,790
Social benefits and salaries	674,080	587,596
Other employee benefits	91,575	96,678
	12,423,667	11,481,064
Current	2,022,137	1,929,087
Non-current	10,401,530	9,551,977
	12,423,667	11,481,064

(1) Includes for 2020 an obligation for a new voluntary retirement plan, on which Ecopetrol made offers to a part of its workers during the year. This plan was approved at the end of 2019 by the Company's Board of Directors (Note 22.6).

22.1 Post-employment benefits liability (asset)

The following table shows the movement in liabilities and assets, net of post-employment benefits and termination benefits, as of December 31, 2020 and 2019:

	Pension and bonds (1)		Other		Total	
	2020	2019	2020	2019	2020	2019
Liabilities for employee benefits						
Opening balance	15,916,472	14,131,943	7,593,171	6,212,118	23,509,643	20,344,061
Current service cost	-	-	118,035	76,478	118,035	76,478
Past service cost (2)	-	-	631,761	-	631,761	-
Interest expense	882,785	920,622	439,682	418,553	1,322,467	1,339,175
Actuarial gains	418,187	1,755,300	87,311	1,273,409	505,498	3,028,709
Benefits paid	(897,061)	(891,393)	(359,366)	(387,387)	(1,256,427)	(1,278,780)
Closing balance	16,320,383	15,916,472	8,510,594	7,593,171	24,830,977	23,509,643
Plan assets						
Opening balance	12,709,838	12,348,557	3,015	3,954	12,712,853	12,352,511
Return on assets	700,168	801,065	136	217	700,304	801,282
Contributions to funds	-	-	370,090	83,071	370,090	83,071
Benefits paid	(897,061)	(891,393)	(358,199)	(84,243)	(1,255,260)	(975,636)
Actuarial gains	644,784	451,609	194	16	644,978	451,625
Closing balance	13,157,729	12,709,838	15,236	3,015	13,172,965	12,712,853
Net post-employment benefits liability	3,162,654	3,206,634	8,495,358	7,590,156	11,658,012	10,796,790

(1) There is no cost for the pension and pension plans service, due to the fact that the beneficiaries were retired as of July 31, 2010.

(2) It includes the new voluntary retirement plan.

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The following table shows the movement in profit and loss and in other comprehensive income as of December 31, 2020, 2019 and 2018:

	2020	2019	2018
Recognized in profit or loss			
Interest expense, net	622,163	537,893	485,842
Current service cost	118,035	76,478	77,373
Past service cost	—	—	50,489
Remedies	—	10,213	503
	740,198	624,584	614,207
Recognized in other comprehensive income			
Pension and pension bonds	226,597	(1,303,693)	1,003
Healthcare	(33,324)	(1,268,379)	(17,356)
Education and severance	(55,693)	922	45,509
Termination benefits – Voluntary retirement plan	(121)	(34)	93
	137,459	(2,571,184)	29,249
Deferred tax	(41,238)	771,355	(33,539)
	96,221	(1,799,829)	(4,290)

22.2 Plan assets

Plan assets are resources held by pension trusts for payment of pension obligations. Payments for health and education post-employment benefits is Ecopetrol's responsibility. The destination of trust resources and its yields cannot be changed or returned to the Ecopetrol Business Group until all pension obligations have been fulfilled.

The following is the composition of the plan assets of pension and pension bonds by type of investment as of December 31, 2020 and 2019:

	2020	2019
Bonds issued by the national government	4,958,612	4,301,961
Bonds of private entities	3,177,531	3,122,630
Other foreign currency	1,992,800	870,859
Other local currency	1,502,349	1,899,787
Other public bonds	777,562	1,082,815
Variable yield	679,448	823,977
Bonds of foreign entities	84,663	610,824
	13,172,965	12,712,853

23.3% (2019 – 26.6%) of plan assets are classified as level 1 in the fair value hierarchy where prices for the assets are directly observable on actively traded markets, and 76.7% (2019 – 73.4%) are classified as level 2.

The fair value of level 2 plan assets is calculated using prices quoted in the assets' market. The Ecopetrol Business Group obtains these prices through reliable financial data providers recognized in Colombia or abroad depending on the investment.

For the securities issued in local currency, the fair value of plan assets is calculated using information published by Precia, a price supplier authorized by the Financial Superintendence of Colombia. According to its methodology, prices are calculated based on market information on the valuation date or estimated from historical inputs according to the criteria established for the calculation of each of the prices.

The average price is calculated based on the most representative market of the transactions carried out through electronic platforms approved and supervised by the regulator.

On the other hand, the estimated price is calculated for investments that do not reflect enough information to estimate an average market price, replicating the quoted prices for similar assets or prices obtained through quotes from brokers. This estimated price is also given by Precia as a result of the application of robust methodologies approved by the financial regulator and widely used by the financial sector.

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The following table reflects the credit ratings of the issuers and counterparties in assets held by the autonomous pension funds:

	2020	2019
Nation	5,102,222	4,448,221
AAA	4,369,805	5,138,279
AA+	570,716	837,009
BBB-	458,273	455,201
BBB	201,163	319,514
AA	134,454	6,679
F1+	61,192	56,728
BRC1+	52,296	68,313
A3	11,633	17,267
BBB+	10,328	22,113
AA-	4,014	16,067
BAA3	-	219,830
SP1+	-	84,933
A-1+	-	78,156
BAA1	-	15,538
A	5,307	11,841
Other credit ratings	297,048	30,129
Not available ratings	1,894,514	887,035
	13,172,965	12,712,853

See credit risk policy in Note 30.8.

22.3 Actuarial assumptions

The following are the actuarial assumptions used in determining the present value of defined employee benefit obligations used for the actuarial calculations as of December 31, 2020 and 2019:

2020	Pension	Bonds	Health	Education	Other benefits (1)
Discount rate	5.50%	4.75%	6.00%	5.00%	4.09%
Salary growth rate	N/A	N/A	N/A	N/A	4.70%
Expected inflation rate	3.00%	3.00%	3.00%	3.00%	3.00%
Pension growth rate	3.00%	N/A	N/A	N/A	N/A
Cost trend					
Short-term rate	N/A	N/A	6.67%	4.00%	N/A
Long-term rate	N/A	N/A	4.00%	4.00%	N/A

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2019	Pension	Bonds	Health	Education	Other benefits (1)
Discount rate	5.75%	5.25%	6.00%	5.50%	4.83%
Salary growth rate	N/A	N/A	N/A	N/A	5.50% / 4.70
Expected inflation rate	3.00%	3.00%	3.00%	3.00%	3.00%
Pension growth rate	3.00%	N/A	N/A	N/A	N/A
Cost trend					
Short-term rate	N/A	N/A	7.00%	4.00%	N/A
Long-term rate	N/A	N/A	4.00%	4.00%	N/A

N/A: Not applicable for this benefit.

(1) Weighted average discount rate.

The cost trend is the projected increase for the initial year, which includes the expected inflation rate.

The mortality table used for the calculations was that of 'Valid Annuitant' for men and women based on the experience gained for the period 2005–2008 of the Colombian Social Security Institute.

22.4 Maturity of benefit obligation

The cash flows required for payment of post-employment obligations are the following:

Period	Pension and bonds	Other benefits	Total
2021	967,810	482,953	1,450,763
2022	996,869	493,791	1,490,660
2023	1,019,379	507,009	1,526,388
2024	1,034,972	511,627	1,546,599
2025	1,069,252	514,556	1,583,808
2026 and thereafter	5,607,391	2,602,556	8,209,947

22.5 Sensitivity analysis

The following sensitivity analysis shows the effect of such possible changes on the obligation for defined benefits, while keeping the other assumptions constant, as of December 31, 2020:

	Pension	Bonds	Health	Education	Other benefits
Discount rate					
–50 basis points	16,139,465	1,147,350	7,798,461	515,004	846,709
+50 basis points	14,368,856	1,072,868	6,715,899	464,394	812,726
Inflation rate					
–50 basis points	14,314,193	1,072,094	N/A	N/A	717,069
+50 basis points	16,193,316	1,147,825	N/A	N/A	740,501
Salary growth rate					
–50 basis points	N/A	N/A	N/A	N/A	96,530
+50 basis points	N/A	N/A	N/A	N/A	105,392
Cost trend					
–50 basis points	N/A	N/A	6,720,777	464,319	N/A
+50 basis points	N/A	N/A	6,720,777	514,849	N/A

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22.6 Voluntary retirement plan

In October 2019, the Ecopetrol's Board of Directors approved a new employee retirement plan that included four categories of retirements from January 2020 until December 2023: compliance of the work cycle (pension), Retirement Plan A (rent), Retirement Plan B (Bonus) and improved compensation. As for December 31, 2019, the Ecopetrol Business Group has not recognize a provision related to this plan, since it will be understood as an obligation at the time the Company offers the plan and each employee voluntarily accepts their retirement by taking advantage of any of the mentioned categories. In May 2020, Ecopetrol started offering this retirement plan, to which 421 workers have applied.

In August 2016, the Ecopetrol offered a voluntary retirement plan, which as of December 31, 2020 was used by 125 workers (2019 – 132) who met certain requirements. This plan includes benefits such as monthly income, education and health benefits until the date on which the employee is granted their retirement pension.

As of December 31, 2020, the amount of the net obligation associated with voluntary retirement plans is \$713,407 (2019 - \$124,186).

23. Accrued liabilities and provisions

	Asset retirement obligation	Litigation	Environmental contingencies and others	Total
Balance as of December 31, 2019	8,835,420	137,429	945,439	9,918,288
Increase in abandonment costs	2,307,453	-	-	2,307,453
Additions	143,320	32,108	237,181	412,609
Uses	(291,793)	(31,709)	(106,448)	(429,950)
Financial costs	258,464	-	-	258,464
Effect of control loss in subsidiaries (Note 28)	(23,874)	(20,117)	-	(43,991)
Adjustment on fair value for business combination	31,137	-	-	31,137
Foreign currency translation	37,239	428	5,476	43,143
Transfers	(58,041)	-	(11,382)	(69,423)
Balance as of December 31, 2020	11,239,325	118,139	1,070,266	12,427,730
Current	949,638	46,844	224,627	1,221,109
Non-current	10,289,687	71,295	845,639	11,206,621
	11,239,325	118,139	1,070,266	12,427,730

	Asset retirement obligation	Litigation	Environmental contingencies and others	Total
Balance as of December 31, 2018	6,719,275	127,945	906,792	7,754,012
Increase in abandonment costs	2,188,928	—	—	2,188,928
Additions	112,486	58,913	90,854	262,253
Uses	(410,191)	(45,342)	(59,755)	(515,288)
Financial costs	226,803	—	3	226,806
Foreign currency translation	(5,240)	79	1,211	(3,950)
Transfers	3,359	(4,166)	6,334	5,527
Balance as of December 31, 2019	8,835,420	137,429	945,439	9,918,288
Current	589,411	28,662	171,224	789,297
Non-current	8,246,009	108,767	774,215	9,128,991
	8,835,420	137,429	945,439	9,918,288

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	Asset retirement obligation	Litigation	Environmental contingencies and others	Total
Balance as of December 31, 2017	5,527,324	182,966	827,159	6,537,449
Increase in abandonment costs	1,062,280	—	—	1,062,280
Additions	71,015	61,851	174,780	307,646
Uses	(182,130)	(114,647)	(100,215)	(396,992)
Financial costs	186,518	—	—	186,518
Foreign currency translation	54,610	(2,368)	10,983	63,225
Transfers	(342)	143	(5,915)	(6,114)
Balance as of December 31, 2018	6,719,275	127,945	906,792	7,754,012
Current	549,678	88,623	176,108	814,409
Non-current	6,169,597	39,322	730,684	6,939,603
	6,719,275	127,945	906,792	7,754,012

23.1 Asset retirement obligation

The estimated liability for asset retirement obligation costs corresponds to the future obligation that the Ecopetrol Business Group to restore environmental conditions to a level similar to that existing before the start of projects or activities, as described in Note 3.5 – Abandonment and dismantling costs of fields and other facilities. As these relate to long-term obligations, this liability is estimated by projecting the expected future payments and discounting at present value with a rate indexed to the Ecopetrol Business Group's financial obligations, taking into account the temporariness and risks of this obligation. The discount rates used in the estimate of the obligation as of December 31, 2020 were: Exploration and Production 2.65% (2019 – 3.01%), Transportation and Logistics 2.71% (2019 – 2.61%) and Refining and Petrochemicals 3.67% (2019- 3.94%). The increase in the provision in 2020 was generated due to the fall in discount rates, directly associated with the decrease in macroeconomic variables impacted by Covid-19.

23.2 Environmental contingencies and others

These correspond to contingencies for environmental incidents and obligations related to environmental compensation and mandatory investment of 1% for the use of, exploitation of or effect on natural resources imposed by national, regional and local environmental authorities. Mandatory investment of 1% is based on the use of water taken directly from natural sources in accordance with the provisions of Law 99 of 1993, Article 43, Decree 1900 of 2006, Decree 2099 of 2017 and 075 and 1120 of 2018 and article 321 of Law 1955 of 2019 in relation to the projects that Ecopetrol develops in Colombia.

The Colombian Government through the Ministry of Environment and Sustainable Development, issued in December 2016 and in January 2017 the Decrees 2099 and 075, which modify the Single Regulatory Decree of the environment and sustainable development sector, Decree 1076 of 2015, related to the mandatory investment for the use of water taken directly from natural sources.

In 2017, the main changes established by these decrees were related to the areas and lines of investment and the basis for settlement of the obligations. Similarly, June 30, 2017 was declared the maximum date to modify investment plans that were underway. On June 30, 2017, Ecopetrol filed with the National Environmental Licensing Authority (ANLA) certain investment plans to meet the 1% mandatory investment based on the new decrees, relative to investment lines, maintaining the settlement base of Decree 1900.

In 2019, Law 1955/2019 was issued, which in its Article 321 unifies the basis for the settlement of this obligation and requires updating the investment obligations of 1% to present value. Ecopetrol carried out the recertification of the settlement base and the acceptance of the percentage of updating of the investment values of 1% in more than 90 environmental licenses, generating a lower provision for this obligation. Currently, ANLA's pronouncements are being received in relation to article 321 of Law 1955, some through official letters and others through resolutions. Ecopetrol has filed an appeal for reconsideration with ANLA in most cases, which are under review by this authority.

23.3 Contingencies

Oleoducto Bicentenario de Colombia S.A.S.

During July 2018, the carriers Frontera Energy Colombia Corp. (Frontera), Canacol Energy Colombia S.A.S. (Canacol) and Vetra Exploración y Producción Colombia S.A.S. (Vetra and, together with Frontera and Canacol, the Carriers) sent letters to Oleoducto Bicentenario de Colombia S.A.S. (Bicentenario) alleging there were early termination rights under the Ship-or-Pay Transport Agreements entered by each of them and Bicentenario in 2012 (the Transport Agreements). Bicentenario has rejected the terms of the letters, noting that there is no option for early termination and reiterating to the Carriers that the Transport Agreements are current and therefore the Carriers must fulfill their obligations under the Transport Agreements in a timely fashion.

Under Bicentenario's understanding that the Transport Agreements remain current and that the Carriers are in violation of their obligations under such agreements, Bicentenario declared the Carriers delinquent because of their failure to pay for transport service under the aforementioned agreements. Consequently, Bicentenario executed the standby letters of credit posted as guarantee for the Transport Agreements.

On October 19, 2018, Bicentenario notified Frontera of the existence of a "Dispute" pursuant to Clause 20 of the respective Transport Agreement and moved to the party dispute settlement stage as provided for in such clause. Such discussions ended without an agreement on December 19, 2018. On January 28, 2019, Bicentenario filed an Arbitration Claim against Frontera in accordance with the arbitration clause of the Transportation Agreement to claim any compensation, indemnification or other restitution deriving from the alleged early termination of said agreements. Similarly, on November 1, 2018, Bicentenario notified Vetra and Canacol of the existence of a "Dispute" pursuant to Clause 20 of the respective Transport Agreement and moved to the party dispute settlement stage as provided for in each such respective clause. Such discussions ended without agreement on March, 2019.

See section Bicentenario, Cenit and Frontera Settlement Agreement below for further developments on the disputes.

Cenit Transporte y Logística de Hidrocarburos S.A.S. ("Cenit")

On November 2018, Cenit filed an arbitration claim against Frontera Energy Group ("Frontera") claiming that the Ship or Pay Agreements of the Caño Limón - Coveñas pipeline, which termination was alleged by Frontera, are in full force and effect and that Frontera is obliged to comply with their terms and conditions, including a dispute regarding the payment of transportation fees applicable to such agreements. Cenit considers that the amounts owed by Frontera for this concept as of December 31, 2020, are \$ 334,583.

The abovementioned fees dispute was at the root of the opposition manifested by Frontera Group against the application of the fees defined by the Ministry of Mines and Energy for the period 2015-2019. The rate differential amounts to \$ 114,075 which was placed by Frontera in a trust fund, whilst the balance of the debt according to Cenit's accounting records on the same date are \$ 99,734, thus evidencing that the amounts receivable are funded.

Frontera has not paid the component of the fee related to the abandonment fund to which Cenit considers they are entitled by virtue of the application of resolutions 31480 and 31661 issued by the Ministry of Mines and Energy. Frontera Energy Group owed \$ 9,663 in connection therewith.

Bicentenario, Cenit and Frontera Settlement Agreement

On November 17, 2020, Cenit, Bicentenario and Frontera reached an agreement, for the joint filing of a petition for a binding settlement which, upon completion and approval by the competent Colombian court, will resolve all the disputes pending among them, related to the Caño Limón – Coveñas pipeline, and will terminate all the pending arbitration proceedings related to such disputes. This transaction eliminates any uncertainty related to the potential outcomes of the disputes, thus protecting the interests of all the parties and those of their stakeholders and create new business opportunities for the parties involved. The settlement arrangement includes a full and final mutual release upon closing of all present and future amounts claimed by all parties in respect of the terminated transportation contracts for the Bicentenario and Caño Limón – Coveñas pipelines. Frontera will also enter into new transportation contracts with Cenit and Bicentenario. Frontera will transfer to Cenit its 43.03% stake in Bicentenario's shareholdings.

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The new ship or pay commitment is projected to be approximately 3,900 bbls/day, based on the current oil price, for a term of five years subject to adjustments, at a current fee of \$11.5/bbl. Frontera will not have to make payments for oil it may have to ship through alternate pipelines. These contracts will allow Cenit and Bicentenario to obtain payment of certain amounts included in the settlement, during the term of the contracts. The arrangement is conditional upon certain regulatory approvals, including approval of the settlement arrangement as a conciliation under Colombian law, which requires an opinion from the Attorney General's Office (Procuraduría General de la Nación) which was issued on March 24, 2021 and approval of the Administrative Tribunal of Cundinamarca. As of the date of this annual report the final approval by the Administrative Tribunal of Cundinamarca was pending.

Bicentenario, Cenit and Canacol Settlement Agreement

On October 30, 2020 Cenit and Canacol reached an agreement to settle all their aforementioned disputes. The settlement arrangement includes a full and final mutual release upon closing of all present and future amounts claimed by all parties in respect of the terminated transportation contracts for the Caño Limón – Coveñas pipelines. On November 18, 2020 the competent arbitration tribunal approved the conciliation agreement entered into by Cenit and Canacol, according to which Canacol was obliged to transfer all its outstanding shares in Bicentenario to Cenit. Additionally, as part of the settlement, Canacol entered into new transportation contracts with Cenit. These contracts will allow Cenit to obtain payment of certain amounts included in the settlement, during the term of the contracts. On the other hand, on March 8, 2021 Bicentenario and Canacol reached an agreement to settle all their aforementioned disputes. The agreement established a formula that seeks to end all contractual obligation disputes between the parties and settle all the outstanding obligations between the companies. (Approval of the conciliation between Bicentenario and Canacol is still pending as of the date of this annual report).

Bicentenario, Cenit and Vetra Settlement Agreement

On November 23, 2020, Cenit and Vetra reached an agreement to settle all their aforementioned disputes. The settlement arrangement includes a full and final mutual release upon closing of all present and future amounts claimed by all parties in respect of the terminated transportation contracts for Caño Limón – Coveñas pipelines. On February 18, 2021 the competent arbitration tribunal approved the conciliation agreement entered into by Cenit and Vetra, according to which Vetra is obliged to transfer all its outstanding shares in Bicentenario to Cenit and to make a cash payment for the remaining balance of the amounts included in the settlement. On the other hand, on January 13, 2021 Bicentenario and Vetra reached an agreement to settle all their aforementioned disputes. The agreement established a formula that seeks to end all contractual obligations between the parties and settle all the outstanding obligations between the companies. (Approval of the conciliation between Bicentenario and Vetra is still pending as of the date of this annual report).

Refinería de Cartagena S.A.S.

Arbitration tribunal:

On March 8, 2016, Reficar filed a request for arbitration with the International Chamber of Commerce (the “ICC”) against Chicago Bridge & Iron Company NV, CB&I (UK) Limited and CBI Colombiana SA (jointly, “CB&I”), concerning a dispute related to the Engineering, Procurement, and Construction Agreements entered into by and between Reficar and CB&I for the expansion of the Cartagena Refinery in Cartagena, Colombia. Reficar is the Claimant in the ICC arbitration and seeks no less than USD\$2 billion in damages plus lost profits.

On May 25, 2016, CB&I filed its Answer to the Request for Arbitration and the preliminary version of its counterclaim against Reficar, for approximately USD \$ 213 million. On June 27, 2016, Reficar filed its reply to CB&I's counterclaim denying and disputing the declarations and relief requested by CB&I.

On April 28, 2017, Reficar filed its non-detailed claim and, on the same date, CB&I submitted its Statement of Counterclaim increasing its claims to approximately USD\$116 million and COP\$387,558 million, including USD \$ 70 million for a letter of credit compliance. On March 16, 2018, CB&I submitted its Exhaustive Statement of Counterclaim further increasing its claims to approximately USD\$129 million and COP\$432,303 million (including in each case interest), and also filed its Exhaustive Statement of Defense to Reficar's claims. On this same date, Reficar filed its Exhaustive Statement of Claim seeking, among others, USD\$ 139 million for provisionally paid invoices under the Memorandum of Agreement (“MOA”) and Project Invoicing Procedure (“PIP”) Agreements and the EPC Contract.

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On June 28, 2019, CB&I submitted its Reply to the Non-Exhaustive Statement of Defence to Counterclaim increasing its claims to approximately USD\$137 million and COP\$503,241 million (including in each case interest, respectively). On this same date, Reficar filed its Reply to CB&I's Non-Exhaustive Statement of Defense and its Exhaustive Statement of Defense to CB&I's counterclaim, updating its claim for provisionally paid invoices under the MOA and PIP Agreements and the EPC Contract to approximately USD\$ 137 million.

In relation to this matter, as of December 31, 2020 there is a balance of approximately USD \$ 122 million, in invoices paid by Reficar to CB&I, under the PIP and MOA Agreements of the EPC contract, whose supports provided to date by CB&I do not show acceptance by AMEC Foster Wheeler - PCIB.

In January 2020, McDermott International Inc. – CB&I parent company – commenced a bankruptcy case under title 11 of the United States Code in the United States Bankruptcy Court for the Southern District of Texas. Faced with this situation, Refinería de Cartagena has taken actions to protect its interests and has a group of experts with whom it will continue to evaluate other measures it may adopt in this new circumstance.

As a consequence of the initiation of the reorganization process, the arbitration was suspended until July 1, 2020, as described below.

On January 21, 2020, Comet II BV, the successor in interest to Chicago Bridge & Iron Company NV, commenced bankruptcy case under title 11 of the United States Code in the United States Bankruptcy Court for the Southern District of Texas. Before the beginning of the insolvency process of Comet II BV, an automatic suspension of the initiation or continuation of any action, process or execution of judgment or award against Comet II BV became effective, which suspended the arbitration. On January 23, 2020, Comet II B.V. obtained an order from the Bankruptcy Court permitting it to, in its discretion, modify the automatic stay to permit it to proceed with litigation or other contested matters. On March 14, 2020, the Bankruptcy Court entered an order confirming a plan of reorganization, and the order provides for the stay against the arbitration to end upon the earlier of the effective date of the plan or August 30, 2020.- whichever would occur first.

On June 30, 2020, McDermott International Inc. notified the occurrence of the effective date of the reorganization plan, for which the suspension of arbitration was lifted on July 1, 2020.

On May 6, 2020, the Superintendence of Companies ordered the judicial liquidation of CBI Colombiana SA, one of the defendants in the CB&I arbitration. On October 22, 2020, Reficar requested its recognition as a creditor of CBI Colombiana SA, up to the maximum amount of its claims in the arbitration. On January 15, 2021, the liquidator of CBI Colombiana SA accepted Reficar's request.

On September 22, 2020, the tribunal scheduled the start of the hearings for May 2021. The outcome of the arbitration remains uncertain until such time as the arbitration ruling is issued.

23.4 Investigations of control entities – Reficar

Reficar is a wholly owned subsidiary of Ecopetrol. According to Colombian regulations, Ecopetrol's and Reficar's employees are considered public servants, and as such can be held liable for negligent use or management of public resources. In this context, given that Ecopetrol is majority owned by the Colombian Government and Reficar is a wholly owned subsidiary of Ecopetrol, Ecopetrol and Reficar administer public resources.

As a result, Ecopetrol and Reficar employees are generally subject to the control and supervision of the following control entities, among others:

The Office of the Comptroller General (Contraloría General de la República) oversees the adequate use of public resources and has the authority to investigate public employees or private sector employees that use or manage public resources.

The Attorney General's Office (Procuraduría General de la Nación) supervises compliance with applicable law by public employees and private sector employees that carry out public functions. The Attorney General's Office investigates and disciplines individuals for compliance failures.

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The Prosecutor's Office (Fiscalía General de la Nación) investigates potential crimes and prosecutes alleged crimes before the court in judicial proceedings.

The following are the most significant investigations and proceedings carried out by the aforementioned state entities:

1. The Office of the Comptroller General's investigations and proceedings

1.1 Because of the modifications of the schedule and budget related to Reficar's expansion and modernization project (the Project), the Office of the Comptroller General initiated a special audit investigation of the Project in 2016 and delivered a final report to Reficar on December 5, 2016. The report detailed 36 findings most of which were related to increased costs compared to budget for services, labor and materials. As required, on January 18, 2017, Reficar submitted an action plan addressing the 36 findings in the following areas: (i) contract management, (ii) supervision of engineering standards contracted with third parties, and (iii) documentation of the control, reporting and monitoring mechanisms of subcontracts.

1.2 As a result of the findings described above, on March 10, 2017, the Office of the Comptroller General opened actions for financial responsibility (proceso de responsabilidad fiscal) against 36 individuals and the six companies involved in the Project, including former members of Ecopetrol's Board of Directors, former members of Reficar's Board of Directors, former employees of Ecopetrol, and former employees of Reficar, as well as Chicago Bridge & Iron Company N.V., CBI - Chicago Bridge & Iron company (CB&I) Americas Ltd., Chicago Bridge & Iron Company CB&I UK Limited, CBI Colombiana S.A., Foster Wheeler USA Corporation and Process Consultants Inc.

These actions were initiated based on the Office of the Comptroller General's theory that lower than expected profitability at Reficar could have been caused by (i) modifications to the schedule and, (ii) the increase of the budget for the Project.

On June 5, 2018, the Office of the Comptroller General split the initial proceeding in two. The first one is related to the increase of the Project's budget and the second one is related to the modifications in the Project's schedule.

Regarding the first proceeding, on June 5, 2018, the Office of the Comptroller General issued charges for financial responsibility (proceso de responsabilidad fiscal) against (i) 15 individuals, which include former members of Reficar's Board of Directors, a former employee of Ecopetrol, and former employees of Reficar, as well as against (ii) CBI - Chicago Bridge & Iron company (CB&I) Americas Ltd., Chicago Bridge & Iron Company CB&I UK Limited, CBI Colombiana S.A., Foster Wheeler USA Corporation and Process Consultants Inc, and the following insurance companies, Compañía Aseguradora de Fianzas S.A, Coaseguro Confianza S.A., Liberty Seguros S.A., CHUBB de Colombia Compañía de Seguros S.A., Seguros Colpatria S.A. and Mapfre Seguros Generales de Colombia S.A., as third parties with joint liability.

As for the other 21 individuals initially investigated in 2017, the Office of the Comptroller General closed the investigations. Therefore, as of the date of this annual report, no current or former member of Ecopetrol's Board of Directors was charged in the first proceeding related to the increase in the Project's budget.

As of the date of this annual report, no charges have been issued in the second proceeding related to the modifications in the Project's schedule.

While the content and status of the proceedings remains confidential, we can report that Reficar and several of its employees have cooperated with and provided the information required by the department of the Office of the Comptroller General in charge of leading the proceedings.

As of the date of this annual report, both Ecopetrol and Reficar have no liability under these proceedings.

1.3 In 2017, 2018, 2019, 2020 and 2021 the Office of the Comptroller General initiated a special/financial audit in Reficar and delivered a final report. In this report the Office of the Comptroller General concluded that, in their opinion, Reficar's Financial Statements do not reasonably represent, the entity's financial position. This situation originates in the different interpretation, by Reficar and the Comptroller General, of the applicable accounting laws. Reficar has used all the legal mechanism to enforce its position.

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As of the date of this annual report, considering the best Group's knowledge, Reficar's financial statements continue to fairly represent the financial and operational condition of the Company in all material aspects and its internal controls remain effective.

As of the date of this annual report, the former and current Boards of Directors of Ecopetrol and Reficar are not part of the Comptroller General proceedings.

2. The Attorney General's Office investigations:

Reficar has been officially informed that the Attorney General's Office currently has four ongoing investigations related to the Project.

Regarding one of these four investigations, on September 12, 2017, the Attorney General's Office issued a list of charges against certain former members of Reficar's Board of Directors, as well as certain former officers of Reficar. The charges were related to the failure to fulfill some of their duties as administrators and/or for acting "ultra vires" in the exercise of their functions against: (i) Javier Genaro Gutiérrez (Ecopetrol CEO, 2007-2015); (ii) Felipe Laverde (Reficar General Counsel, 2009-March 2017); (iii) Pedro Rosales (Ecopetrol Downstream Executive Vice President, 2008-2015); (iv) Diana Constanza Calixto (Ecopetrol Head of the Corporate Finance Unit, 2009-2014), (v) Orlando José Cabrales (Reficar CEO, 2009-2012) and (vi) Reyes Reinoso Yanes (Reficar CEO, 2012-2016). The Attorney General's Office closed the case against the rest of the members of Reficar's Board of Directors and the rest of the former officers of Reficar.

On January 17, 2020 the Attorney General's Office issued its judgment against Reyes Reinoso Yanes for acting "ultra vires" in the exercise of his functions promoting a special billing procedure without the due diligence required to protect Reficar's resources. As for the other four individuals initially investigated, they were acquitted of the charges. Mr. Reinoso filed an appeal against the decision and is awaiting resolution.

In another investigation, on October 21, 2020, the Attorney General's Office issued its judgment against a former employee of Reficar, Nicolas Isaksson Palacios, related to the failure to fulfill some of his duties for acting "ultra vires" in the exercise of his functions. The Attorney General's Office closed the case against the rest of the former members of Reficar's Board of Directors and other Reficar employee.

The specific content and status of the remaining two ongoing investigations remains confidential.

As of the date of this annual report, the current Boards of Directors of Ecopetrol and Reficar are not part of the Attorney General's Office proceedings.

3. The Prosecutor's Office investigations:

The Prosecutor's Office has been conducting the following legal proceedings in which Ecopetrol has been recognized as a victim:

- 3.1 Between July 25 and August 2, 2017, the Prosecutor's Office indicted the following individuals with charges, the majority of which are related to offenses against the public administration and illegal interest in the execution of agreements: (i) Orlando José Cabrales Martínez (Reficar CEO, 2009-2012); (ii) Reyes Reinoso Yanes (Reficar CEO, 2012-2016); (iii) Felipe Laverde Concha (Reficar General Counsel, 2009-March 2017); (iv) Pedro Alfonso Rosales Navarro (Ecopetrol Downstream Executive Vice President, 2008-2015); (v) Masoud Deidehban (CBI Executive Project Director); (vi) Phillip Asherman (CBI CEO) and (vii) Carlos Lloreda (Reficar's statutory auditor from 2013-2015.) The arraignment hearing began on May 30, 2018 and concluded on August 22, 2019.

The Prosecutor's Office has already made public the factual basis for such charges, which is based on the theory that: (i) executing a cost reimbursable engineering, procurement and construction contract (EPC) and not a lump sum agreement favored CBI interests, and (ii) executing special invoicing procedures (MOA –Memorandum of Agreement and PIP –Project Invoicing Procedure) with CBI allowed the payments of unreasonable amounts not duly verified by the Joint Venture Foster Wheeler USA Corporation and Process Consultant Inc (FPJVC). The defense attorneys have not yet had an opportunity to present their case against such facts in a court of law.

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On May 9, 2017, Ecopetrol's Audit and Risk Committee retained a U.S.-based outside law firm to commence a third-party investigation into the matters set forth in the Prosecutor's Office announcement. The results were presented in December 2017 to Ecopetrol's Audit and Risk Committee. This investigation concluded that to date there has been no evidence of possible unlawful acts that affect Ecopetrol's internal control over the financial reporting of the Company, on the allegations made by the Prosecutor's Office.

- 3.2 On October 22 and 23, 2018, the Prosecutor's Office indicted the following individuals with charges related to improper management and obtaining false public documents: Javier Genaro Gutiérrez Pemberthy (Ecopetrol CEO, 2007-2015), Reyes Reinoso Yáñez (Reficar CEO, 2012-2016), Pedro Alfonso Rosales Navarro (Ecopetrol Downstream Executive Vice President, 2008-2015), and Diana Constanza Calixto Hernández (Ecopetrol Head of the Corporate Finance Unit, 2009-2014). The arraignment hearing took place on August 5, 2019 and Ecopetrol and Reficar were recognized as victims.

The Prosecutor's Office made public the factual basis of the charges, which is based on the theory that the indicted directors hid necessary information from Ecopetrol's Board of Directors before the approval of amendment No. 3 of the EPC contract. The defense attorneys have not yet had an opportunity to present their case against such facts in a court of law.

- 3.3 On June 12, 2019, the Prosecutor's Office indicted the following individuals with charges related to entering into agreements without compliance with legal requirements: Orlando José Cabrales Martínez (Reficar CEO, 2009-2012) and Felipe Castilla (Reficar CEO, 2009). Ecopetrol and Reficar were recognized as victims.

The Prosecutor's Office has already made public the factual basis of the charges, which is based on the theory that hiring FPJVC as the PMC of the project through a sole source process violated the objective selection principle. The defense attorneys have not yet had an opportunity to present their case against such facts in a court of law.

Ecopetrol and Reficar have cooperated closely and extensively with the control entities in furthering their investigations and will continue to monitor the status and development of these investigations.

As of the date of this annual report, the current Boards of Directors of Ecopetrol and Reficar and the current employees are not part of the above proceedings. None of the legal proceedings described in this paragraph are related with bribery charges.

As of the date of this annual report, Ecopetrol and Reficar have no knowledge of any legal proceeding in the United States regarding the project.

23.5 Legal proceedings not recognized

The following is a summary of the main contingent liabilities that have not been recognized in the statement of financial position as, according to the evaluations made by internal and external advisors of the Ecopetrol Business Group, the expectation of loss is not probable as of December 31, 2020 and 2019:

Type of process	2020		2019	
	Number of processes	Proceedings	Number of processes	Proceedings
Constitutional action	20	15,810,719	16	15,689,778
Ordinary administrative	156	714,606	162	781,686
Ordinary labor	659	54,030	614	51,029
Ordinary civil	54	6,363	54	17,956
Executive administrative	2	11,951	1	28
Special labor	15	3,106	13	720
Penal	2	595	1	595
Action of protection	234	47	112	10
Executive civil	1	-	1	-
	1,143	16,601,417	974	16,541,802

23.6 Details of contingent assets

The following is a breakdown of the Ecopetrol Business Group's principal contingent assets, where the associated contingent gain is likely, but not certain:

Type of process	2020		2019	
	Number of processes	Proceedings	Number of processes	Proceedings
Ordinary administrative	99	402,380	37	384,215
Arbitration	2	138,386	1	67,232
Ordinary civil	114	82,572	75	86,363
Penal	149	61,466	156	60,177
Executive civil	57	5,299	61	4,912
Ordinary labor	48	3,129	50	3,295
Executive administrative	10	2,450	11	4,028
Special labor	84	426	57	307
Action of protection	5	-	4	-
	568	696,108	452	610,529

24. Equity

The main components of equity are detailed below:

24.1 Subscribed and paid-in capital

Ecopetrol's authorized capital amounts to COP\$36,540,000, and is comprised of 60,000,000,000 ordinary shares, of which 41,116,694,690 are outstanding, and 11.51% (4,731,906,273 shares) are held privately and 88.49% (36,384,788,417 shares) are held by the Colombian Government. The value of the reserve shares amounts to COP\$11,499,933 comprised of 18,883,305,310 shares. As of December 31, 2020 and 2019, subscribed and paid-in capital amounts to COP\$25,040,067. There are no potentially dilutive shares.

24.2 Additional paid-in capital

Additional paid-in capital mainly corresponds to: (i) share premium from the Ecopetrol Business Group's capitalization in 2007, for COP\$4,457,997, (ii) share premium from the sale of shares awarded in the second capitalization, which took place in September 2011, of COP\$2,118,468, (iii) a COP\$31,377 share premium from the placement of shares on the secondary market, arising from the calling of guarantees from debtors in arrears, according to the provisions of Article 397 of the Code of Commerce, and (iv) additional paid-in capital receivables for COP\$(143).

24.3 Equity reserves

The following is the composition of the Ecopetrol Business Group's reserves as of December 31, 2020 and 2019:

	2020	2019
Legal reserve	4,568,980	3,243,832
Fiscal and statutory reserves	509,082	509,082
Occasional reserves (1)	4,557,074	31,744
	9,635,136	3,784,658

(1) Ecopetrol's General Shareholders' Meeting, held on March 27, 2020, approved the 2019 profit distribution project and set up a reserve of 4,557,074 in order to support the Company's financial sustainability and flexibility in development of its strategy.

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The movement of equity reserves is the following for the years ended December 31, 2020 and 2019:

	2020	2019
Opening balance	3,784,658	5,138,895
Release of reserves	(540,826)	(3,050,703)
Allocation to reserves	6,391,304	5,355,852
Dividends declared	-	(3,659,386)
Closing balance	9,635,136	3,784,658

24.4 Retained earnings and dividends

The Ecopetrol Business Group distributes dividends based on its separate annual financial statements, prepared under International Financial Reporting Standards accepted in Colombia (NCIF, by its acronym in Spanish).

The General Assembly of Shareholders of Ecopetrol S.A. held on March 27, 2020, decreed dividends on the 2019 profit for COP\$7,401,005 (2019 – COP\$9,251,256). A total of 100% of decreed dividends was paid during 2020 and 2019.

On March 26, 2021, the ordinary General Shareholders Assembly approved a distribution of ordinary dividends for the fiscal year ended December 31, 2020 amounting to COP\$698,984 million, or COP\$17 per share, based on the number of outstanding shares. The payment date will be April 22, 2021 for 100% of shareholders.

24.5 Other comprehensive income attributable to owners of parent

The following is the composition of the other comprehensive income attributable to the shareholders of the parent, Ecopetrol S.A., net of tax:

	2020	2019	2018
Foreign currency translation	11,794,201	10,265,398	10,235,891
Cash flow hedge with derivative instruments	44,132	3,689	(30,962)
Cash flow hedges for future exports	(136,470)	(135,748)	(374,079)
Actuarial gain on defined benefit plans	(2,260,989)	(2,357,210)	(557,381)
Hedge of a net investment in a foreign operation	(1,494,926)	(1,130,583)	(1,069,316)
Others	1,114	1,114	176,608
	7,947,062	6,646,660	8,380,761

24.6 Earnings per share

	2020	2019	2018
Profit attributable to Ecopetrol's shareholders	1,586,677	13,744,011	11,381,386
Weighted average number of outstanding shares	41,116,694,690	41,116,694,690	41,116,694,690
Net basic earnings per share (Colombian pesos)	COPS 38.6	COPS 334.3	COPS 276.8

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25. Sales revenue from contracts with customers

	2020	2019	2018
National sales			
Mid-distillates (1)	8,860,588	15,041,883	14,039,638
Gasoline and turbo fuels (1)	6,768,046	9,658,180	9,334,939
Services	2,859,559	4,115,626	3,531,404
Natural gas	2,845,155	2,256,123	1,885,846
Plastic and rubber	865,204	834,133	899,410
Fuel gas service	671,570	72,249	-
Asphalts	526,100	544,200	335,426
LPG and propane	375,775	372,916	574,639
Crude oil	230,520	356,857	550,479
Aromatics	155,740	228,552	282,545
Polyethylene	138,035	192,436	270,887
Fuel oil	37,001	97,907	509,482
Other income gas contracts (2)	32,190	102,845	156,031
Other products	322,232	431,201	651,874
	24,687,715	34,305,108	33,022,600
Foreign sales			
Crude oil (3)	19,498,582	28,523,596	26,898,737
Diesel	3,164,068	4,391,798	3,050,839
Plastic and rubber	1,302,131	1,249,189	1,308,685
Fuel oil (4)	968,429	1,870,929	2,053,594
Gasoline and turbo fuels	179,257	1,085,392	1,782,194
LPG and propane	18,943	13,591	20,212
Natural gas	17,231	27,255	27,899
Cash flow hedge for future exports – Reclassification to profit or loss (Note 30.3)	(193,374)	(386,773)	128,404
Other products	580,411	408,427	310,708
	25,535,678	37,183,404	35,581,272
	50,223,393	71,488,512	68,603,872

(1) Corresponds to the application of Decree 180522 of March 29, 2010, and other standards that modify and add (Decree 1880 of 2014 and Decree 1068 of 2015), which establishes the procedure to recognize the subsidy for refiners and importers of ordinary motor gasoline and ACPM, and the methodology for calculating the net position (value generated between the parity price and the regulated price, which can be positive or negative). As of December 31, 2020, the value recognized by price differential corresponds to COP\$142,723 (2019 COP\$1,785,277; 2018 COP\$3,835,533). See Note 4.16 – Sales revenue recognition from contracts with customers.

(2) Corresponds to the income on the participation in the profits of gas sales, according to the agreement signed between Ecopetrol and Hocol (considering the assets purchase agreement signed with Chevron to acquire the stake owned by the latter in the Guajira Association as of May 1, 2020), for the extension of the association contract for the exploitation of gas in La Guajira. Prior to this acquisition, the agreement was signed between Ecopetrol and Chevron since 2004.

(3) Includes hedges with derivative instruments for COP\$(587,591).

(4) Includes hedges with derivative instruments for COP\$(76,382).

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Sales by geographic areas

	2020	%	2019	%	2018	%
Colombia	24,687,715	49.2%	34,305,108	48.0%	33,022,600	48.1%
United States	11,365,218	22.6%	17,371,173	24.3%	14,765,674	21.5%
Asia	9,497,498	18.9%	13,529,151	18.9%	12,271,225	17.9%
Central America and the Caribbean	2,581,644	5.1%	3,472,665	4.9%	4,449,033	6.6%
South America and others	1,296,370	2.6%	1,502,815	2.1%	2,968,038	4.3%
Europe	794,948	1.6%	1,307,600	1.8%	1,127,302	1.6%
	50,223,393	100%	71,488,512	100%	68,603,872	100%

Concentration of customers

During 2020, Organización Terpel S.A. represented 15.0% of sales revenue for the period (2019 – 16.0% and 2018 – 14.0%); no other customer represented more than 10% of total sales. There is no risk of the Ecopetrol Business Group's financial situation being affected by a potential loss of the client. The commercial relationship with this customer is for the sale of refined products and transportation services.

26. Cost of sales

	2020	2019	2018
Variable costs			
Imported products (1)	7,592,489	12,639,710	11,809,529
Depreciation amortization and depletion	6,069,903	5,523,306	5,064,518
Purchases of crude in association and concession	4,281,661	5,466,496	3,820,746
Purchases of hydrocarbons – ANH (2)	2,798,432	5,437,177	5,667,567
Electric energy	1,098,621	829,543	662,297
Hydrocarbon transport services	874,632	821,654	696,964
Taxes and economic rights	841,443	788,924	441,207
Process materials	827,464	1,016,617	968,884
Purchases of other products and gas	598,015	584,507	632,509
Services contracted in associations	269,637	267,778	260,207
Others (3)	657,634	(676,269)	(186,087)
	25,909,931	32,699,443	29,838,341
Fixed costs			
Depreciation and amortization	2,930,120	2,781,446	2,555,176
Labor costs	2,299,761	2,316,567	2,105,803
Maintenance	2,257,370	2,497,002	2,260,984
Services contracted	1,623,375	1,841,009	1,796,354
Services contracted in associations	1,121,010	1,211,510	1,040,221
Taxes and contributions	593,041	516,933	393,690
Materials and operating supplies	508,037	574,678	565,601
Hydrocarbon transport services	253,752	268,572	261,237
General costs	71,075	265,200	366,972
	11,657,541	12,272,917	11,346,038
	37,567,472	44,972,360	41,184,379

(1) Imported products correspond mainly to diesel and diluent to facilitate the transport of heavy crude oil.

(2) Corresponds to purchases of crude oil by Ecopetrol from the National Hydrocarbons Agency (ANH, by its acronym in Spanish) derived from national production, both of the Ecopetrol Business Group's direct operations and of third parties.

(3) Corresponds mainly to: i) the valuation of the inventory, product of the costing process, ii) the valuation at Net Realizable Value, and iii) the agreements of inventories by transport and iv) capitalizable costs to projects.

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27. Administrative, operations and project expenses

	2020	2019	2018
Administrative expenses			
Labor expenses (1)	(1,658,613)	(759,324)	(662,258)
General expenses (2)	(1,424,348)	(1,140,975)	(911,645)
Depreciation and amortization	(229,792)	(202,547)	(40,838)
Taxes	(60,397)	(48,753)	(39,117)
	<u>(3,373,150)</u>	<u>(2,151,599)</u>	<u>(1,653,858)</u>
Operations and project expenses			
Exploration costs	(689,087)	(763,452)	(1,387,379)
Commissions fees freights and services	(656,432)	(558,370)	(466,862)
Taxes	(428,608)	(483,330)	(433,506)
Labor expenses	(309,972)	(402,531)	(316,386)
Fee for regulatory entities	(142,695)	(94,785)	(98,794)
Depreciation and amortization	(83,909)	(60,952)	(44,318)
Maintenance	(78,181)	(56,333)	(50,846)
Right-of-use assets amortization	(10,814)	(14,532)	-
Others	(186,318)	(197,469)	(105,041)
	<u>(2,586,016)</u>	<u>(2,631,754)</u>	<u>(2,903,132)</u>

(1) Includes for 2020 recognition of the new voluntary retirement plan for 421 workers.

(2) Recognition of plants without temporary production given the health situation.

28. Other operating income (expenses), net

	2020	2019	2018
Gain on revaluation of assets in Guajira association (1)	1,284,372	-	-
Gain (loss) on acquisition of participations and interests (1)	86,026	1,048,924	(12,065)
Loss on sale of assets	(263,647)	(148,021)	(93,601)
Expense for legal provisions	(139,978)	(98,020)	(68,398)
Impairment loss of short-term assets	(34,416)	(90,441)	(105,692)
Gain on loss of control (2)	65,695	-	-
Other income	120,114	344,354	244,301
	<u>1,118,166</u>	<u>1,056,796</u>	<u>(35,455)</u>

(1) Results in the acquisition of La Guajira: Ecopetrol COP\$1,284,372 and Hocol COP\$86,026. For Ecopetrol it corresponds to the revaluation of the assets that it already had in the Guajira association and for Hocol it corresponds to the Bargain obtained from the acquisition of the 43% stake. (Note 12 – Business combinations).

(2) Recognition of the disposal of net assets due to the loss of control due to the opening of the judicial liquidation process of Bioenergy S.A.S. and Bioenergy Zona Franca S.A.S. COP\$65,570 (Note 2.2). Liquidation process of ECP Oil and Gas Germany GmbH COP\$125.

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29. Financial result, net

	2020	2019	2018
Finance income			
Results from financial assets and others	665,310	975,245	745,571
Yields and interests	299,246	481,674	383,624
Gain on derivatives valuation	108,838	-	-
Dividends (1)	44	117,260	-
Gain on sale of equity instruments	-	-	368
Other financial income	27,992	49,157	-
	1,101,430	1,623,336	1,129,563
Finance expenses			
Interest (2)	(2,384,342)	(1,894,490)	(2,399,414)
Financial cost of other liabilities (3)	(872,987)	(757,509)	(668,782)
Results from financial assets	(473,598)	(638,767)	(381,445)
Other financial expenses	(198,864)	(43,703)	(62,520)
	(3,929,791)	(3,334,469)	(3,512,161)
Foreign exchange gain net	346,774	40,639	372,223
Financial result net	(2,481,587)	(1,670,494)	(2,010,375)

(1) In 2007, Arrendadora Financiera Internacional Bolivariana (AFIB) and Ecopetrol S.A. signed an agreement to constitute a trust fund, in which Invercolsa deposited dividends corresponding to 8.53% of the participation in dispute, regarding the shares acquired by Fernando Londoño. In 2019, as a result of the sentence of the Supreme Court of Justice, Ecopetrol received the amount of dividends that were in that trust.

(2) As of December 31, 2020, borrowing costs for the financing of developing natural resources and property, plant and equipment of COP\$247,501 (2019 – COP\$248,139 and 2018 – COP\$200,833) were capitalized.

(3) Includes the financial expense of the asset retirement obligations and the liabilities for post-employment benefits.

30. Risk management

30.1 Exchange rate risk

The Ecopetrol Business Group operates mainly in Colombia and makes sales in the local and international markets, for that reason, it is exposed to exchange rate risk. The impact of exchange rate fluctuations, especially the Colombian peso/U.S. dollar exchange rate, has been material considering events presented during 2020 such as the disagreement between the members of the Organization of Petroleum Exporting Countries (OPEC) and Russia to maintain the cuts in production and the effects of the Covid-19 pandemic.

As of December 31, 2020, the Colombian peso depreciated 4.7%, going from a closing rate as of December 31, 2019 of COP\$3,277.14 to COP\$3,432.5 pesos per dollar.

When the Colombian peso depreciates, export earnings, when converted to pesos, increase, and imports and external debt service become more expensive.

The balance of financial assets and liabilities denominated in foreign currency for the years ended December 31, is presented in the following table:

(in US\$Million)	2020	2019
Cash and cash equivalents	197	114
Other financial assets	1,164	1,468
Trade receivables and payables, net	203	81
Loans and borrowings	(11,814)	(9,429)
Other assets and liabilities, net	277	64
Net liability position	(9,973)	(7,702)

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Of the total net position, USD\$(10,158) million correspond to net liabilities of companies with the Colombian peso as its functional currency, of which USD\$(8,549) correspond to loans used as hedging instruments whose valuation is recognized in other comprehensive income, the exchange rate difference valuation of the remaining net liabilities for USD\$(1,609) million affect the profit or loss. Likewise, USD\$(185) million of the net position correspond to monetary assets and liabilities of Group companies with a functional currency different from the Colombian peso, whose valuation is recognized in profit or loss.

30.2 Sensitivity analysis for exchange rate risk

The following is the effect of a change of 1% and 5% in the exchange rate of the Colombian peso as compared with the U.S. dollar, on the balance of financial assets and liabilities denominated in foreign currency as of December 31, 2020:

Scenario / Variation in the exchange rate	Effect on income before taxes (+/-)	Effect on other comprehensive income (+/-)
1%	(48,866)	(293,457)
5%	(244,330)	(1,467,286)

30.3 Cash flow hedge for future exports

In order to present on financial statements the effect of the natural hedge between exports and debt, and considering that the exchange rate risk materializes when the exports are made, on October 1, 2015, the Board of Directors designated the amount of USD\$5,440 million of Ecopetrol's foreign currency debt as a hedge instrument of future revenue from crude oil exports, for the period 2015–2023 in accordance with IFRS 9 – Financial instruments.

The following is the movement of foreign currency debt designated as a non-derivative hedging instrument for the years ended December 31, 2020 and 2019:

(USD\$Million)	2020	2019
Hedging instrument at the beginning of the period	1,300	1,300
Reassignment of hedging instruments	1,230	5,551
Realization of exports	(1,230)	(5,551)
Hedging instrument at the end of the period	1,300	1,300

The following is the movement in other comprehensive income for the years ended December 31, 2020, 2019 and 2018:

	2020	2019	2018
Opening balance	(135,748)	(374,079)	159,295
Exchange difference	(201,967)	(35,607)	(704,871)
Reclassification to profit or loss	193,374	386,773	(128,404)
Ineffectiveness	9,779	5,173	35,617
Deferred income tax	(1,908)	(118,008)	264,284
Closing balance	(136,470)	(135,748)	(374,079)

The expected reclassification of the cumulative exchange difference from other comprehensive income to the profit or loss is as follows:

Year	Before taxes	Taxes	After taxes
2021	(71,358)	21,408	(49,950)
2022	(71,358)	21,408	(49,950)
2023	(52,245)	15,675	(36,570)
	(194,961)	58,491	(136,470)

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30.4 Hedge of a net investment in a foreign operation

The Board of Directors approved the application of net investment hedge accounting from June 8, 2016. The measure is intended to reduce the volatility of non-operating income due to exchange rate variations. The net investment hedge will be applied on a portion of the Ecopetrol Business Group's investments in foreign operations, in this case on investments in subsidiaries which have the U.S. dollar as their functional currency, using a portion of the Ecopetrol Business Group's U.S. dollar denominated debt as the hedging instrument.

Ecopetrol designated as the hedged item the net investments in Oleoducto Central S.A. (Ocensa), Ecopetrol América LLC., Hocol Petroleum Ltd. (HPL) and Refinería de Cartagena S.A.S. (Reficar) and as a hedging instrument a portion of its debt denominated in US dollars, in a total amount equivalent to USD\$5.2 billion. During 2019 and 2020 Ecopetrol S.A. expanded this hedge for USD\$2,049 million to include in the designation the investments in Ecopetrol Permian LLC and Ecopetrol Brasil and add a greater amount in Reficar. The total hedged value as of December 31, 2020 is USD\$7,249 million.

The following is the movement in other comprehensive income for the years ended December 31:

	2020	2019	2018
Opening balance	1,130,583	1,069,316	97,362
Exchange difference	520,490	87,524	1,381,900
Ineffectiveness	—	—	378
Deferred income tax	(156,147)	(26,257)	(410,324)
Closing balance	1,494,926	1,130,583	1,069,316

30.5 Hedging with financial derivatives

In 2020, Ecopetrol carries out forward non-delivery operations for the sale of dollars in order to mitigate the volatility of the exchange rate in the cash flow required for the Company's operations. As of December 31, 2020, the Group has open positions for COP\$91,305.

The impact on the profit or loss as of December 31, 2020 due to the settlement of these hedges generated a loss of COP\$62,911 (2019 - COP\$60,740) and the amount recognized in the other comprehensive income was a profit of COP\$51,486 (2019 - COP\$43,141).

30.6 Commodity price risk

The price risk of raw materials is associated with the Group's operations, both exports and imports of crude oil, natural gas and refined products. In order to mitigate this risk, the Group has implemented hedges to partially protect the results from price fluctuations, considering that part of the financial exposure under contracts for the purchase of crude oil and refined products depends on the international oil prices.

The risk of such exposure is partially hedged in a natural way, as an integrated Group (with operations in the exploration and production, transportation and logistics and refining segments) and carries out both crude exports at international market prices and sales of refined products at prices correlated with international prices.

The Group has a policy for the execution of (strategic and tactical) hedges and implemented processes, procedures and controls for their management. The main purpose of the strategic hedging program is to protect the Group's consolidated financial statements from the volatility of market variables in a given period of time, to protect income and thus cash flow. On the other hand, tactical hedges allow to capture value in trading operations and Asset Backed Trading (ABT), thereby mitigating the market risk of specific operations.

The following is the detail of the operations during 2020:

1) Strategic hedges

The operations were oriented to specifically protect income and cash flow, limit losses, cover production costs and avoid potential closures of production fields (Apiay, Caño Sur and Chichimene), and therefore a possible acceleration in the decline of the basic curve. For this purpose, hedges for about 30 million barrels (MMBLS) were managed.

The operations carried out during 2020 were managed considering the analysis, approval, monitoring and compliance processes as defined in current policies and procedures, achieving the objectives defined for the hedge. In addition, these operations were classified as effective in accordance with IFRS standards. The benefit of these contracts was USD\$42.7 million.

2) Tactical hedges

The commitments in physical spots and term contracts in the commercialization activity represent an exposure to the price risk of commodities, in particular the risk associated with the volatility of the price of crude oil and refined products. Although said exposure is part of the natural risk of the production, refining and commercialization activity carried out by Ecopetrol, in order to maximize value capture, Ecopetrol can concentrate the risk exposure in terms of time and/or indicator that differs from the Company's natural price risk profile.

Swaps operations for 18 MMBLS to mitigate risks associated with storage marketing strategies, anticipated purchases of raw materials, supply to refineries and international sales delivered at the destination port expired last year. Such strategies – together with their hedge – allowed to get benefits of around USD\$15 million.

Similarly, hedges on exports of heavy fuel oil were made in 2020 corresponding to 3.7 MMBLS; this operation allowed to guarantee profits in the amount of USD\$25.5 million.

As of the date of this report, the Group has in its asset a swap position of COP\$7,572 and a forward position of COP\$91,305 (Note 9). These derivative operations are recognized under cash flow hedge accounting.

30.7 Credit risk

Credit risk is the risk that the Ecopetrol Business Group may suffer financial losses as a consequence of default of: (a) payments by its clients for the sale of crude oil, gas, products or services; (b) financial institutions in which it keeps investments, or (c) by counterparties with which it has contracted financial instruments.

Credit risk related to customers

In the selling process of crude oil, gas, refined products and petrochemicals, and transport services, the Ecopetrol Business Group may be exposed to credit risk in the event that customers fail to fulfill their payment obligations. The Ecopetrol Business Group's risk management strategy has designed mechanisms and procedures that aim to minimize such events, thus safeguarding the Ecopetrol Business Group's cash flow.

The Ecopetrol Business Group performs a continuous analysis of the financial strength of its counterparties, by classifying them according to their risk level and financial guarantees in the event of a default of payments. Similarly, the Ecopetrol Business Group continuously monitors national and international market conditions for early alerts of major changes that may have an impact on the timely payment of obligations from customers.

For the receivables that are considered exposed to credit risk, Ecopetrol Business Group make individual analysis of each customer's situation to determine the value of impairment to recognize in financial statements. The Ecopetrol Business Group performs administrative and legal actions required to recover amounts past due and charges interest from customers that fail to comply with payment policies.

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An aging analysis of the accounts receivable portfolio in arrears, but not impaired, as of December 31, 2020 and 2019 is as follows:

	2020	2019
Less than 3 months overdue	56,144	243,893
Between 3 and 6 months overdue	1,270	136,700
More than 6 months overdue	301,858	267,525
	359,272	648,118

Credit risk in financial assets

Following the promulgation of Decree 1525 of 2008, which provides general rules on investments for public entities, Ecopetrol's management established guidelines for its investment portfolios. These guidelines determine that investments in Ecopetrol's U.S. dollar portfolios are generally limited to investments of cash excess in fixed-income securities issued by entities rated A or higher in the long term and A1/P1/F1 or higher in the short term (international scale) by Standard & Poor's Ratings Services, Moody's Investors Service or Fitch Ratings.

In addition, Ecopetrol S.A. may also invest in securities issued or guaranteed by the United States of America or Colombia governments, without regard to the ratings assigned to such securities. In Ecopetrol's Colombian Peso portfolio, it must invest the cash excess in fixed-income securities of issuers rated AAA in the long term, and F1+/BRC1+ in the short term (local scale) by Fitch Ratings Colombia or BRC Standard & Poor's. Likewise, the Company may also invest in securities issued or guaranteed by the national government without qualification restrictions.

In order to diversify the risk in the Colombian Peso portfolio, Ecopetrol does not invest more than 10% of the cash excess in one specific issuer. In the case of the U.S. dollar portfolio, Ecopetrol does not invest more than 5% of the cash excess in one specific issuer in the short term (up to one year), or 1% in the long term.

The credit rating of issuers and counterparties in transactions involving financial instruments is disclosed in Note 6 – Cash and cash equivalents, Note 9 – Other financial assets and Note 22 – Provisions for employees' benefits.

30.8 Interest rate risk

Interest rate risk arises from Ecopetrol's exposure to changes in interest rates because the Ecopetrol Business Group has investments in fixed and floating-rate instruments and has issued floating rate debt linked to LIBOR, DTF and CPI interest rates. Thus, interest rate volatility may affect the fair value and cash flows of the Ecopetrol Business Group's investments and the financial expense of floating rate loans and financing.

As of December 31, 2020, 16% (2019, 17% and 2018, 17%) of the Ecopetrol Business Group's indebtedness is linked to floating interest rates. As a result, if market interest rates rise, financing expenses will increase, which could have an adverse effect on the results of operations.

Ecopetrol controls the exposure to interest rate risk by establishing limits to the portfolio duration, Value at Risk – VAR and *tracking error*.

Autonomous equities linked to Ecopetrol's pension obligations are also exposed to changes in interest rate, as they include fixed and floating rate instruments that are recognized according to the mark to market. Colombian regulation for pension funds, as stipulated in the Decree 941 of 2002 and Decree 1861 of 2012, indicates that they have to follow the same regime as the regular obligatory pension funds in their moderate portfolio.

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The following table provides information about the sensitivity of the Ecopetrol Business Group's results and other comprehensive income for the next 12 months to variations in interest rate of 100 basis points:

	Effect on profit or loss (+/-)		Effect on Other Comprehensive Income (+/-)
	Financial Assets	Financial Liabilities	Plan Assets
+100 basis points	(25,878)	60,577	(557,002)
-100 basis points	25,878	(59,459)	557,901

A sensitivity analysis of discount rates on pension plan assets and liabilities is disclosed in Note 22 – Provisions for employees' benefits.

30.9 Liquidity risk

The ability to access credit and capital markets to obtain resources for the investment plan execution for the Business Group may be limited due to adverse changes in market conditions. A global financial crisis could worsen risk perception in emerging markets.

Events that could affect the political and regional environment of Colombia may make it difficult for our subsidiaries to access the capital markets. These conditions, together with potential significant losses in the financial services sector and changes in credit risk assessments, may make it difficult to obtain resources on favorable terms. As a result, the Ecopetrol Business Group may be forced to review the conditions of the investment plan (as necessary), or access financial markets under unfavorable terms, thereby negatively affecting the Ecopetrol Business Group's results of operations and financial results.

Liquidity risk is managed in accordance with the Ecopetrol Business Group's policies aimed at ensuring that enough cash flows to comply with the Ecopetrol Business Group's financial commitments within the established dates and with no additional costs. The main method for the measurement and monitoring of liquidity is cash flow forecasting.

The following is a summary of the maturity of financial liabilities as of December 31, 2020. The amounts disclosed in the table are the contractual undiscounted cash flows. The payments in foreign currency were restated taking a constant exchange rate of COP\$3,432.50 per U.S. dollar:

	Up to 1 year	1-5 years	5-10 years	> 10 years	Total
Loans (payment of principal and interest)	3,585,623	33,051,812	17,701,887	13,750,003	68,089,325
Trade and other payables	8,449,041	21,064	—	—	8,470,105
Total	12,034,664	33,072,876	17,701,887	13,750,003	76,559,430

30.10 Capital management

The main objective of the capital management of the Ecopetrol Business Group is to ensure a financial structure that optimizes the cost of capital, maximizes the rate of return to its shareholders and allows access to financial markets at a competitive cost to cover financial needs that support an investment grade credit rating profile.

The following is the leverage ratio as of December 31, 2020 and 2019:

	2020	2019
Loans and borrowings (Note 20)	46,731,754	38,239,139
Cash and cash equivalents (Note 6)	(5,082,308)	(7,075,758)
Other financial assets (Note 9)	(3,071,659)	(4,979,292)
Net financial debt	38,577,787	26,184,089
Equity (Note 24)	53,499,363	58,231,628
Leverage (1)	41.90%	31.02%

(1) Leverage = Net financial debt / (Net financial debt + Equity)

The movement of the net financial debt is detailed in Note 20.7.

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31. Related parties

Balances with associates and joint ventures as of December 31, 2020 and 2019 are as follows:

	Accounts receivable	Accounts receivable – Loans	Other assets	Accounts payable	Loans	Other liabilities
Joint Ventures						
Equion Energia Limited (1)	1,950	-	7,093	32,335	1,277,046	1,663
Ecodiesel Colombia S.A.	1,345	-	-	35,632	-	1
Offshore International Group Inc (2)	-	97,300	-	-	-	-
Associates						
Gas Natural del Oriente S.A. E.S.P.	-	-	-	1,858	-	-
Extrucol S.A.	-	-	-	279	-	-
E2 Energia Eficiente S.A. E.S.P.	4,453	-	-	1,264	-	-
Serviport S.A.	-	-	-	948	-	-
Balance as of December 31, 2020	7,748	97,300	7,093	72,316	1,277,046	1,664
Current	7,748	97,300	7,093	72,316	1,277,046	1,664
Non-current	-	-	-	-	-	-
	7,748	97,300	7,093	72,316	1,277,046	1,664
	(Nota 7)	(Nota 7)	(Nota 11)	(Nota 21)	(Nota 20)	
	Accounts receivable	Accounts receivable – Loans	Other assets	Accounts payable	Loans	Other liabilities
Joint Ventures						
Equion Energia Limited(1)	25,333	—	57,016	153,501	1,108,403	794
Ecodiesel Colombia S.A.	2,116	—	—	29,447	—	1
Offshore International Group Inc.(2)	—	93,657	—	—	—	—
Associates						
Serviport S.A.	—	—	—	4,668	—	—
Balance as of December 31, 2019	27,449	93,657	57,016	187,616	1,108,403	795
Current	27,449	—	57,016	187,616	1,108,403	795
Non-current	—	93,657	—	—	—	—
	27,449	93,657	57,016	187,616	1,108,403	795
	(Note 7)	(Note 7)	(Note 11)	(Note 21)	(Note 20)	

Loans:

(1) Resources deposited by Equion in Ecopetrol Capital AG.

Accounts receivable – Loans:

(2) Offshore International Group: Loan granted by Ecopetrol S.A. for USD\$57 million in 2016, with an interest rate of 4.99% payable semiannually from 2017 and maturing in 2021. The balance in nominal value of this loan as of December 31, 2020 is USD\$28 million (2019 – USD\$28 million).

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The main transactions with related parties as of December 31 are detailed as follows:

	2020		2019		2018	
	Sales and services	Purchases and others	Sales and services	Purchases and others	Sales and services	Purchases and others
Joint Ventures						
Equion Energía Limited	27,595	356,872	317,382	569,105	67,002	846,284
Ecodiesel Colombia S.A	8,268	346,201	8,614	280,649	6,860	267,498
Offshore International Group	4,461	—	3,245	—	2,386	—
	40,324	703,073	329,241	849,754	76,248	1,113,782
Associates						
E2 Energía Eficiente S.A. E.S.P.	49,860	2,849	—	—	—	—
Gas Natural del Oriente S.A. E.S.P.	—	26,141	—	—	—	—
Extrucol S.A.	—	1,162	—	—	—	—
	90,184	733,225	329,241	849,754	76,248	1,113,782

31.1 Directors and key management personnel

In accordance with the approval given by the shareholders' meeting in 2012, which was recorded in Minute No. 026, the directors' fees for attending the meetings of the Board of Directors and / or the committees increase from four to six legal monthly minimum legal monthly salaries in force. On the other hand, in the General Shareholders' Meeting of 2018, the amendment of the Corporate Bylaws that appears in Minute No. 036 was approved, by virtue of which, the fourth paragraph of article 23 was eliminated that made the differentiation between the fees for face-to-face and non-face-to-face meetings. The members of the Board of Directors do not have any kind of variable remuneration. The amount paid in 2020 for fees to members of the Board of Directors amounted to COP\$3,102 (2019 - COP\$1,847).

The total compensation paid to Directors as of December 31, 2020, amounted to COP\$24,068 (2019 - COP\$22,632 and 2018 - COP\$21,580). Directors are not eligible to receive pension and retirement benefits. The total amount reserved as of December 31, 2020, to provide pension and retirement benefits to the eligible executive officers amounted to COP\$13,413 (2019 - COP\$18,740 and 2018 - COP\$5,491).

As of December 31, 2020, key management officers owned less than 1% of the outstanding shares of Ecopetrol S.A. as follows:

Key management personnel	% Shares
Felipe Bayón	<1% outstanding shares
Jaime Caballero	<1% outstanding shares
Orlando Díaz	<1% outstanding shares
Jorge Calvache	<1% outstanding shares

31.2 Post-employment benefit plans

The administration and management of resources for payment of Ecopetrol's pension obligations are managed by autonomous pension funds (PAPs, by its acronym in Spanish) which serve as guarantee and payment sources. In 2008, Ecopetrol S.A. received the authorization to partially commute the value corresponding to monthly payments, bonds and quotas, transferring said obligations and the money that support them to autonomous patrimonies of a pension nature, in accordance with the requirements of Decree 1833 of 2016.

Since November 2016, the entities that manage the resources are: Fiduciaria Bancolombia, Fiduciaria de Occidente and Consorcio Ecopetrol PACC (formed by Fiduciaria La Previsora, Fiduciaria Bancoldex, Fiduagraria and Fiduciaria Central).

These trust companies will manage the pension resources for a period of five years (2016-2021) and as compensation they receive remuneration with fixed and variable components, the latter are settled on the gross yields of the portfolios and charged to the resources managed.

31.3 Government related parties

The Colombian Government controls Ecopetrol with a stock ownership of 88.49%. The most significant transactions with governmental entities are comprised as follows:

(a) Purchase of oil from the National Hydrocarbons Agency – ANH

The ANH, an entity which operates under the rules of the Ministry of Mines and Energy, has as objective to manage the oil and gas reserves and resources owned by the Colombian Nation.

By nature of the business, Ecopetrol purchases the crude oil that the ANH receives from producers in Colombia at the prices set in accordance with a established formula, which reflects the sale prices (crude oils and products), adjusted for API gravity quality, sulfur content, transportation rates to the export ports, refining process cost and a commercialization rate (when apply). The contract between Ecopetrol and the ANH ended on October 30, 2020 and a new one began with effect from November 1, 2020 to October 31, 2022.

From December 2013 the Ecopetrol Business Group commercialized, on behalf of the ANH, the natural gas received by the latter in kind from producers. Since January 2014, ANH has received royalties in cash for the production of natural gas.

The purchase value of oil and gas from ANH is detailed in Note 26 – Cost of sales.

Additionally Ecopetrol, like other oil and gas companies, takes part in “rounds” for the allocation of exploration blocks in Colombia without implying special treatment for Ecopetrol on count of it being an entity whose majority shareholder is the Colombian Government.

(b) Price differential

The sale prices of regular gasoline and diesel are regulated by the National Government. In that way, there are differentials between the volume reported by the companies at the time of sale and the difference between the parity price and the reference price, the parity price being the one that corresponds to the daily prices of motor gasoline and diesel observed during the month. This differential can be for or against the producers. The value of this differential is detailed in Note 25 - Sales revenue from contracts with customers and in Note 7 - Trade and other receivables, net.

(c) National Tax and Customs Direction

Ecopetrol, just like any other company in Colombia, has tax obligations that it must comply with and does not have any other kind of association or commercial relationship with the National Tax and Customs Direction of Colombia. For more information, see Note 10 – Taxes.

(d) Comptroller General of the Republic

Ecopetrol, just like any other state entity in Colombia, is obliged to comply with the requirements set out by the Comptroller General of the Republic and make an annual payment to this entity on account of a maintenance fee. Ecopetrol does not have any other kind of association or commercial relationship with this entity.

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32. Joint operations

The Ecopetrol Business Group carries out exploration and production operations through Exploration and Production (E&P) Contracts, Technical Evaluation (TEA) Contracts and Agreements signed with the National Hydrocarbons Agency or ANH, as well as through Partnership Contracts and other types of contracts. The main joint operations in 2020 are as follows:

32.1 Contracts in which Ecopetrol is not the operator

Partners	Contract	Type	% Participation	Geographic area of operations
Occidental de Colombia LLC	Chipirón		30-41%	
Occidental Andina LLC	Cosecha	Production	30%	Colombia
	Cravo Norte		55%	
	Rondón		50%	
Mansarovar Energy Colombia Ltd	Nare	Production	50%	Colombia
Frontera Energy Colombia Corp.	Quifa	Production	40%	Colombia
	Casanare		74.40%	
	Corocora		83.91%	
Perenco Colombia Limited	Estero	Production	95.98%	Colombia
	Garcero		91.22%	
	Orocúe		86.47%	
ONGC Videsh Limited Sucursal Colombiana	Ronda Caribe RC-10	Exploration	50%	Offshore Caribe Norte
Petrobras, Repsol & Statoil	Tayrona	Exploration	50%	Offshore Caribe Norte
Shell EP Offshore Ventures Limited	Fuerte Sur			
	Purple Angel	Exploration	50%	Offshore Caribe Norte
	Col-5			
Shell	Saturno		10%	
	Sul de Gato do Mato	Exploration	30%	Brazil
	Gato do Mato		30%	
BP Energy	Pau Brasil	Exploration	20%	Brazil
Chevron	CE-M-715_R11	Exploration	50%	Brazil
Lewis	SSJN1	Exploration	50%	Colombia
	Mana		30%	
Interoil Colombia	Ambrosia	Production	30%	Colombia
	Rio Opia		30%	
Canacol	Rancho Hermoso-Mirador	Production	100%	Colombia
	Rancho Hermoso -Otras formaciones		70%	
	Llanos 86		50%	
	Llanos 87		50%	
Geopark	Llanos 104	Exploration	50%	Colombia
	Llanos 123		50%	
	Llanos 124		50%	
Fieldwood - Gunflint	Gunflint	Production	32%	Gulf of Mexico
Murphy Oil -	Dalmatian	Production	30%	Gulf of Mexico
Oxy (Anadarko) - K2	K2	Production	21%	Gulf of Mexico
Shell	Deep Rydberg/Aleatico	Exploration	29%	Gulf of Mexico
HESS	ESOX	Production	21%	Gulf of Mexico
Pemex Exploración y Producción	Bloque 8	Exploration	50%	Gulf of Mexico
PC Carigali Mexico Operation SA	Bloque 6	Exploration	50%	Gulf of Mexico
Talos	Palmer	Exploration	30%	Gulf of Mexico
OXY (Anadarko)	Warrior	Exploration	30%	Gulf of Mexico
Occidental Petroleum Company	Rodeo Midland Basin	Production	49%	Permian Texas U.S.

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32.2 Contracts in which Ecopetrol is the operator

Partners	Contract	Type	% Participation	Geographic area of operations
	VMM29			
ExxonMobil Exploration Colombia	CR2	Exploration	50%	Colombia
	C62			
Repsol Colombia oil & gas limited	CPO9	Exploration	55%	Colombia
ONGC Videsh Limited Sucursal Colombia	RC9	Exploration	50%	Colombia
CPVEN E&P Corp Sucursal Colombia	VMM32	Exploration	51%	Colombia
Shell Exploration and Production	CR4	Exploration	50%	Colombia
SK Innovation Co Ltd.	San Jacinto	Exploration	70%	Colombia
Repsol Exploración Colombia S.A.	Catleya	Exploration	50%	Colombia
Emerald Energy PLC Suc. Colombia	Cardon	Exploration	50%	Colombia
Parex Resources Colombia Ltd.	ORC401 CRC-2004-01	Exploration	50%	Colombia
Repsol Colombia Oil & Gas Limited	CPO9 - Akacias	Production	55%	Colombia
Occidental Andina LLC	La Cira Infantas	Production	58%	Colombia
	Teca		76%	
Ramshorn International Limited	Guariques I	Production	50%	Colombia
Perenco Oil And Gas	San Jacinto Rio Paez	Production	68%	Colombia
Cepsa Colombia				
Total Colombia	Mundo Nuevo	Exploration	15%	Colombia
Talisman Oil & Gas				
Equion Energia Limited				
Emerald Energy	Oleoducto Alto Magdalena	OAM	45%	Colombia
Frontera Energy				
Lewis	Clarinero	Exploration	50%	Colombia
Talisman Oil & Gas	Niscota	Production	20%	Colombia
Total Colombie				
ONGC	RC-9	Exploration	50%	Colombia

32.3 Relevant operations during the period

During 2020 the following relevant events were presented in the joint operations contracts:

- On February 7, 2020, Ecopetrol and Shell EP Offshore Ventures Limited ("Shell") signed an agreement through which Shell will acquire a 50% stake in the Fuerte Sur blocks, Purple Angel and COL-5, located in deep waters of the Colombian Caribbean, where the discovery of a new gas province was made with the Kronos (2015), Purple Angel and Gorgon (2017) wells. Following the commercial agreement, Shell will take over the operation of the blocks and a delimiting well will be drilled in the area at the end of 2021 and the first production test will be carried out, once the respective approvals from the authorities are fulfilled. This transaction was concluded on December the 23rd, 2020.

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33. Information by segments

A description of the Ecopetrol Business Group's business segments is in Note 4.19 – Information by business segment.

The following segment information is reported based on the information used by the Board of Directors as the top body to make strategic and operational decisions of these business segments. The performance of the segments are based primarily on an analysis of income, costs, expenses and results for the period generated by each segment which are regularly monitored.

The information disclosed in each segment is presented net of transactions between the Ecopetrol Business Group companies.

33.1 Statement of profit or loss

Below are the consolidated statements of profit or loss by segment for the years ended December 31, 2020, 2019 and 2018:

	For the year ended on December 31, 2020				
	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Eliminations	Total
Third-party sales	22,854,925	24,804,887	2,563,581	—	50,223,393
Inter-segment sales	13,985,072	1,299,464	9,630,859	(24,915,395)	—
Total sales revenue	36,839,997	26,104,351	12,194,440	(24,915,395)	50,223,393
Fixed costs	(9,479,317)	(3,427,211)	(2,813,856)	4,062,842	(11,657,542)
Variable costs	(23,429,102)	(22,398,344)	(567,501)	20,485,017	(25,909,930)
Cost of sales	(32,908,419)	(25,825,555)	(3,381,357)	24,547,859	(37,567,472)
Gross profit	3,931,578	278,796	8,813,083	(367,536)	12,655,921
Administrative expenses	(2,163,198)	(936,175)	(533,594)	259,817	(3,373,150)
Operation and project expenses	(1,511,510)	(781,309)	(403,657)	110,460	(2,586,016)
Impairment of non-current assets	(192,693)	(781,528)	341,065	—	(633,156)
Other operating income and expenses net	1,085,114	34,705	1,827	(3,480)	1,118,166
Operating income (expenses)	1,149,291	(2,185,511)	8,218,724	(739)	7,181,765
Financial result net					
Financial income	1,177,712	67,832	125,677	(269,791)	1,101,430
Financial expenses	(2,896,060)	(914,534)	(389,394)	270,197	(3,929,791)
Foreign exchange gain (loss) net	360,409	(447,880)	434,245	-	346,774
	(1,357,939)	(1,294,582)	170,528	406	(2,481,587)
Share of profits of associates and joint ventures	(53,037)	131,462	(2,089)	-	76,336
Income before tax	(261,685)	(3,348,631)	8,387,163	(333)	4,776,514
Income tax	43,569	614,269	(2,696,499)	-	(2,038,661)
Net profit (loss) for the period	(218,116)	(2,734,362)	5,690,664	(333)	2,737,853
Profit (loss) attributable to:					
Group owners of parent	(139,279)	(2,848,511)	4,574,800	(333)	1,586,677
Non-controlling interest	(78,837)	114,149	1,115,864	—	1,151,176
	(218,116)	(2,734,362)	5,690,664	(333)	2,737,853
Supplementary information					
Depreciation depletion and amortization	6,445,812	1,599,780	1,278,946	—	9,324,538

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For the year ended on December 31, 2019					
	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Eliminations	Total
Third-party sales	31,295,118	36,393,470	3,799,924	—	71,488,512
Inter-segment sales	21,372,872	2,377,336	9,270,812	(33,021,020)	—
Total sales revenue	52,667,990	38,770,806	13,070,736	(33,021,020)	71,488,512
Fixed costs	(9,587,961)	(3,523,948)	(3,039,452)	3,878,443	(12,272,918)
Variable costs	(26,785,904)	(34,332,271)	(698,742)	29,117,475	(32,699,442)
Cost of sales	(36,373,865)	(37,856,219)	(3,738,194)	32,995,918	(44,972,360)
Gross profit	16,294,125	914,587	9,332,542	(25,102)	26,516,152
Administrative expenses	(1,284,560)	(496,155)	(372,942)	2,058	(2,151,599)
Operation and project expenses	(1,475,710)	(743,378)	(434,904)	22,238	(2,631,754)
Impairment of non-current assets	(1,982,044)	452,163	(232,556)	—	(1,762,437)
Other operating income and expenses net	49,673	1,014,988	74,607	(82,472)	1,056,796
Operating income (expenses)	11,601,484	1,142,205	8,366,747	(83,278)	21,027,158
Financial result net					
Financial income	1,440,440	229,297	273,613	(320,014)	1,623,336
Financial expenses	(2,311,133)	(996,790)	(306,878)	280,332	(3,334,469)
Foreign exchange gain (loss) net	287,286	(179,936)	(66,711)	—	40,639
	(583,407)	(947,429)	(99,976)	(39,682)	(1,670,494)
Share of profits of associates and joint ventures	227,401	17,091	138	122,274	366,904
Income before tax	11,245,478	211,867	8,266,909	(686)	19,723,568
Income tax	(1,925,798)	(83,504)	(2,709,111)	—	(4,718,413)
Net profit (loss) for the period	9,319,680	128,363	5,557,798	(686)	15,005,155
Profit (loss) attributable to:					
Group owners of parent	9,382,129	117,708	4,244,860	(686)	13,744,011
Non-controlling interest	(62,449)	10,655	1,312,938	—	1,261,144
	9,319,680	128,363	5,557,798	(686)	15,005,155
Supplementary information					
Depreciation depletion and amortization	5,892,822	1,398,948	1,291,013	—	8,582,783

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For the year ended on December 31, 2018					
	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Eliminations	Total
Third-party sales	30,112,900	34,947,948	3,543,024	—	68,603,872
Inter-segment sales	20,259,864	2,063,425	7,811,143	(30,134,432)	—
Total sales revenue	50,372,764	37,011,373	11,354,167	(30,134,432)	68,603,872
Fixed costs	(8,871,709)	(3,204,791)	(2,805,516)	3,535,979	(11,346,037)
Variable costs	(23,367,475)	(32,453,962)	(596,571)	26,579,666	(29,838,342)
Cost of sales	(32,239,184)	(35,658,753)	(3,402,087)	30,115,645	(41,184,379)
Gross profit	18,133,580	1,352,620	7,952,080	(18,787)	27,419,493
Administrative expenses	(889,293)	(443,880)	(320,498)	(187)	(1,653,858)
Operation and project expenses	(1,993,054)	(668,177)	(263,104)	21,203	(2,903,132)
Impairment of non-current assets	785,940	(984,704)	(169,870)	—	(368,634)
Other operating income and expenses, net	(137,836)	(13,652)	118,905	(2,872)	(35,455)
Operating income (expenses)	15,899,337	(757,793)	7,317,513	(643)	22,458,414
Financial result, net					
Financial income	1,099,893	147,689	110,898	(228,917)	1,129,563
Financial expenses	(2,038,312)	(1,295,528)	(407,589)	229,268	(3,512,161)
Foreign exchange gain (loss), net	868,479	(517,410)	21,154	—	372,223
	(69,940)	(1,665,249)	(275,537)	351	(2,010,375)
Share of profits of associates and joint ventures	135,265	27,730	2,841	—	165,836
Income before tax	15,964,662	(2,395,312)	7,044,817	(292)	20,613,875
Income tax	(6,096,591)	420,224	(2,582,118)	—	(8,258,485)
Net profit (loss) for the period	9,868,071	(1,975,088)	4,462,699	(292)	12,355,390
Profit (loss) attributable to:					
Group owners of parent	9,930,519	(1,973,075)	3,424,234	(292)	11,381,386
Non-controlling interest	(62,448)	(2,013)	1,038,465	—	974,004
	9,868,071	(1,975,088)	4,462,699	(292)	12,355,390
Supplementary information					
Depreciation, depletion and amortization	5,248,364	1,307,216	1,149,270	—	7,704,850

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33.2 Sales by product

The sales by product for each segment are detailed below for the years ended December 31, 2020, 2019 and 2018:

For the year ended on December 31, 2020					
	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Eliminations	Total
Local sales					
Mid-distillates	—	8,871,938	—	(11,350)	8,860,588
Gasoline and turbo fuels	6,739	7,880,124	—	(1,118,817)	6,768,046
Services	116,485	268,081	12,194,384	(9,719,391)	2,859,559
Natural gas	3,683,018	—	—	(837,863)	2,845,155
Plastic and rubber	—	865,204	—	—	865,204
Fuel gas service	—	678,396	—	(6,826)	671,570
Asphalts	27,043	499,057	—	—	526,100
LPG and propane	249,533	133,525	—	(7,283)	375,775
Crude oil	13,250,275	—	—	(13,019,755)	230,520
Aromatics	—	155,740	—	—	155,740
Polyethylene	—	138,035	—	—	138,035
Fuel oil	7,758	29,243	—	—	37,001
Other income gas contracts	32,190	—	—	—	32,190
Other products	19,556	417,889	—	(115,213)	322,232
	17,392,597	19,937,232	12,194,384	(24,836,498)	24,687,715
Foreign sales					
Crude oil	19,577,898	29	—	(79,345)	19,498,582
Diesel	—	3,164,068	—	—	3,164,068
Plastic and rubber	—	1,302,131	—	—	1,302,131
Fuel oil	—	968,429	—	—	968,429
Gasoline and turbo fuels	—	179,257	—	—	179,257
LPG and propane	18,943	—	—	—	18,943
Natural gas	17,231	—	—	—	17,231
Cash flow hedge for future exports – Reclassification to profit or loss (Note 30.3)	(193,374)	—	—	—	(193,374)
Other products	26,702	553,206	56	447	580,411
	19,447,400	6,167,120	56	(78,898)	25,535,678
	36,839,997	26,104,352	12,194,440	(24,915,396)	50,223,393

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	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Eliminations	Total
Local sales					
Mid-distillates	—	13,573,007	—	(31,251)	13,541,756
Gasoline and turbo fuel	—	11,269,797	—	(1,896,767)	9,373,030
Transport service	57,316	51,812	12,853,762	(9,133,788)	3,829,102
Natural gas	2,909,770	49,420	—	(653,647)	2,305,543
Plastic and rubber	—	760,301	—	—	760,301
Asphalts	24,690	519,510	—	—	544,200
LPG and propane	179,541	193,375	—	—	372,916
Crude	21,056,104	—	—	(20,699,247)	356,857
Services	169,062	232,407	216,920	(309,036)	309,353
Aromatics	—	228,552	—	—	228,552
Polyethylene	—	190,133	—	—	190,133
Other income gas contracts	102,845	—	—	—	102,845
Fuel oil	1,464	96,443	—	—	97,907
Other products	25,215	779,407	—	(297,286)	507,336
	24,526,007	27,944,164	13,070,682	(33,021,022)	32,519,831
Recognition of price differential	—	1,785,277	—	—	1,785,277
	24,526,007	29,729,441	13,070,682	(33,021,022)	34,305,108
Foreign sales					
Crude	28,461,601	61,995	—	—	28,523,596
Diesel	—	4,391,798	—	—	4,391,798
Fuel oil	—	1,870,929	—	—	1,870,929
Plastic and rubber	—	1,200,668	—	—	1,200,668
Gasoline and turbo fuels	—	1,085,392	—	—	1,085,392
Natural gas	27,255	—	—	—	27,255
LPG and propane	13,591	—	—	—	13,591
Cash flow hedge for future exports – reclassification to profit or loss	(386,773)	—	—	—	(386,773)
Other products	26,309	430,584	55	—	456,948
	28,141,983	9,041,366	55	—	37,183,404
	52,667,990	38,770,807	13,070,737	(33,021,022)	71,488,512

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	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Eliminations	Total
Local sales					
Mid-distillates	725	11,662,476	—	(77,009)	11,586,192
Gasoline and turbo fuel	—	9,690,113	—	(1,737,261)	7,952,852
Transport service	37,279	36,321	11,089,012	(7,631,208)	3,531,404
Natural gas	2,535,658	—	—	(649,812)	1,885,846
Plastic and rubber	—	822,367	—	—	822,367
Crude	20,142,527	—	—	(19,592,048)	550,479
LPG and propane	245,875	329,569	—	(805)	574,639
Fuel oil	20,391	489,091	—	—	509,482
Asphalts	26,406	309,020	—	—	335,426
Aromatics	—	282,545	—	—	282,545
Polyethylene	—	270,887	—	—	270,887
Services	103,522	190,612	265,059	(319,783)	239,410
Other income gas contracts	156,031	—	—	—	156,031
Other products	11,484	604,530	—	(126,507)	489,507
	23,279,898	24,687,531	11,354,071	(30,134,433)	29,187,067
Recognition of price differential	—	3,835,533	—	—	3,835,533
	23,279,898	28,523,064	11,354,071	(30,134,433)	33,022,600
Foreign sales					
Crude	26,898,737	—	—	—	26,898,737
Diesel	—	3,050,839	—	—	3,050,839
Fuel oil	—	2,053,594	—	—	2,053,594
Gasoline and turbo fuels	—	1,782,194	—	—	1,782,194
Plastic and rubber	—	1,268,582	—	—	1,268,582
Natural gas	27,899	—	—	—	27,899
LPG and propane	20,212	—	—	—	20,212
Cash flow hedge for future exports – Reclassification to profit or loss	128,404	—	—	—	128,404
Other products	17,614	333,101	96	—	350,811
	27,092,866	8,488,310	96	—	35,581,272
	50,372,764	37,011,374	11,354,167	(30,134,433)	68,603,872

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33.3 Capital expenditures by segments

The following are the investments amounts made by each segment for the years ended December 31, 2020, 2019 and 2018:

2020	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Total
Property, plant and equipment	2,866,600	1,329,181	836,536	5,032,317
Natural and environmental resources	5,994,462	—	—	5,994,462
Intangibles	41,002	8,771	40,309	90,082
	8,902,064	1,337,952	876,845	11,116,861
2019	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Total
Property, plant and equipment	2,151,194	497,512	1,363,953	4,012,659
Natural and environmental resources	9,798,193	—	—	9,798,193
Intangibles	25,775	20,569	121,945	168,289
	11,975,162	518,081	1,485,898	13,979,141
2018	Exploration and Production	Refining and Petrochemicals	Transport and Logistics	Total
Property, plant and equipment	2,071,604	702,247	529,078	3,302,929
Natural and environmental resources	5,051,828	—	—	5,051,828
Intangibles	56,755	20,203	28,711	105,669
	7,180,187	722,450	557,789	8,460,426

34. Subsequent events

- **Sale of stake in Offshore International Group**

A Share Purchase Agreement was signed on January 19, 2021 with one of the subsidiaries of De Jong Capital LLC. Pursuant to which Ecopetrol sold the entire 50% stake it had in Offshore International Group (OIG).

- **Non-binding offer to acquire participation in ISA**

On January 27, 2021, Ecopetrol announced its interest in acquiring 51.4% of the outstanding shares of ISA, currently owned by the Colombian Government's Ministerio de Hacienda y Credito Publico (MHCP). If the acquisition is consummated, Ecopetrol expects ISA to assist the Ecopetrol Group in increasing its exposure to new businesses aligned with global trends in electrification and decarbonization, which in turn could help leverage the Ecopetrol Group's profitable growth and improve its risk profile.

ISA operates and maintains a high voltage transmission network in Colombia, Peru, Bolivia, Brazil and Chile, among others, and participates through its subsidiaries in the toll-road business, telecommunications and management of real-time systems. Based on its public reports as filed with the Superintendencia Financiera de Colombia (the "SFC"), ISA's consolidated revenues and net income for the third quarter of 2020 totaled COP 2.4 trillion and COP 483.8 billion, respectively; and its total assets were COP 52.3 trillion as of September 30, 2020. As of February 19, 2021, ISA's market capitalization as reported on the Colombian Stock Exchange (BVC) was COP 25.5 trillion.

On February 12, 2021, Ecopetrol and the MHCP signed an exclusivity agreement through which the parties will carry out non-binding preliminary conversations on the terms and conditions of the potential transaction. The exclusivity period is initially scheduled to end on June 30, 2021 unless extended by mutual agreement of the parties. During this period, Ecopetrol will carry out due diligence activities on ISA and the MHCP has agreed to negotiate exclusively with Ecopetrol.

- **New operating model for the transport segment**

On February 1, 2021, Cenit assumed the integral operation of its infrastructure, directly executing the local and centralized operation of its hydrocarbon transport systems. With this change, Cenit also assumes the local operation of the Ocesa, Bicentenario and ODC (Oleoducto de Colombia) systems, and consolidates itself as the leader of Ecopetrol Group's transport segment.

- **WACC calculation methodology for liquid fuel transport**

On February 8, 2021, the Energy and Gas Regulatory Commission (CREG) issued resolution 004 of 2021, whereby the Energy and Gas Regulatory Commission (CREG) establishes the WACC calculation methodology for activities regulated by CREG. Said activities include electric power distribution and transmission, and distribution and transportation of gas and liquid fuels. The discount rate for the transportation of liquid fuels through pipelines will be calculated and applied once the rate methodology for this activity is updated. In accordance with the CREG's regulatory agenda, the methodology proposal is expected to be issued for comments during the second half of 2021 and the final document is expected to be published at the end of the year.

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35. Supplemental information on oil and gas producing activities (unaudited)

The information in this note is referred to as “unaudited” as a means of clarifying that it is not covered by the audit opinion of the independent registered public accounting firm that has audited and reported on the “Consolidated Financial Statements.”

In accordance with the requirements of the United States Securities and Exchange Commission (SEC), Rule 4–10(a) of Regulation S–X, Release 33–8879, Accounting Standards Codification 932 and the ASU– 2010–03 “Oil and Gas reserve Estimation and Disclosures” rule, this section provides supplemental information on oil and gas exploration and producing activities of the Ecopetrol Business Group. The information included in sections (1) to (3) provides historical cost information pertaining to costs incurred in exploration, property acquisitions and development, capitalized costs and results of operations. The information included in sections (4) and (5) presents information on Ecopetrol’s estimated net proved reserve quantities, standardized measure of estimated discounted future net cash flows related to proved reserves and changes in estimated discounted future net cash flows.

The following information corresponds to Ecopetrol’s oil and gas producing activities as of December 31 2020, 2019 and 2018, and includes information related to the Ecopetrol Business Group’s consolidated subsidiaries, as well as its investments the joint ventures Equion Energía Limited and Offshore International Group. The oil and gas exploration and production activities of these two joint ventures are immaterial, as such the corresponding information has not been disclosed separately.

Under the SEC final rule optional disclosure of possible and probable reserves is allowed but, the Ecopetrol Business Group opted not to do so. Ecopetrol estimated its reserves without considering non-traditional resources.

35.1 Capitalized costs relating to oil and gas exploration and production activities

	2020	2019	2018
Natural and environmental properties	67,767,005	60,261,025	53,752,436
Wells, equipment and facilities – property, plant and equipment	31,166,804	30,150,268	29,416,081
Exploration and production projects	12,494,665	8,801,630	8,463,584
Accumulated depreciation, depletion and amortization	(64,233,572)	(60,346,094)	(55,689,222)
Net capitalized cost	47,194,902	38,866,829	35,942,879

It includes information of the Exploration and Production segment subsidiaries and joint ventures.

In accordance with IAS 37, costs capitalized to natural and environmental properties include provisions for asset retirement obligations of COP\$3,936,494, COP\$2,336,236 and COP\$1,076,116 during 2020, 2019 and 2018, respectively.

35.2 Costs incurred in oil and gas exploration and developed activities

Costs incurred are summarized below and include both amounts expensed and capitalized in the corresponding period.

	2020	2019	2018
Acquisition of proved properties (1)	507,907	2,668,960	—
Acquisition of unproved properties (2)	1,274,660	261,231	81,295
Exploration costs	1,340,898	640,556	1,197,946
Development costs	7,367,020	8,084,283	6,346,276
	10,490,485	11,655,030	7,625,517

- (1) For 2020, it corresponds mainly to the acquisition of the entire participation in the Guajira Association (43% of the association contract) by Hocol and its position as operator. In July 2019, Ecopetrol S.A. and Occidental Petroleum Corp. (OXY) entered into a Joint Operation contract in order to execute a joint plan for the development of unconventional drilling in the Permian Basin in the state of Texas (USA).
- (2) During 2020, Ecopetrol S.A. through its subsidiary Ecopetrol Óleo e Gás do Brasil Ltda acquired 30% of the interests, rights and obligations in two areas that correspond to the BM-S-54 Concession Contract and the Sul de Gato do Mato Shared Production Contract, located offshore in Santos basin of Brazil, in the discovery of hydrocarbons called “Gato do Mato”. Additionally, Ecopetrol Óleo e Gás do Brasil Ltda has recognized the billing related to activities of drilling during the year. On July 17, 2019, the Ministry of Mines and Energy of Brazil authorized the transfer of 10% of the Saturn block for USD\$85 million, located in the Santos basin, to Ecopetrol Óleo e Gás do Brasil, this percentage of which Shell Brasil Petróleo Ltda and Chevron Brasil Óleo e Gas Ltda. were equal holders. In the new shareholding structure, Ecopetrol retains 10% of the interests of the block, while Shell (operator) and Chevron each retain 45% of the total.

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35.3 Results of operations for oil and gas exploration and production activities

The Ecopetrol Business Group's results of operations from oil and gas exploration and production activities for the years ended December 31, 2020, 2019 and 2018 are as follows:

	2020	2019	2018
Net revenues			
Sales	30,141,662	42,070,018	39,633,866
Transfers	7,025,839	11,564,358	11,794,014
	37,167,501	53,634,376	51,427,880
Production costs(1)	12,753,880	9,336,387	8,337,413
Depreciation, depletion and amortization(2)	6,393,506	6,049,543	5,591,774
Other production costs(3)	14,005,669	21,550,907	18,918,275
Exploration expenses(4)	689,204	763,562	1,387,463
Other expenses(5)	2,227,481	4,163,241	1,036,983
	36,069,740	41,863,640	35,271,908
Income before income tax expense	1,097,761	11,770,736	16,155,972
Income tax expense	(233,255)	(2,107,363)	(6,303,251)
Results of operations for exploration and production activities	864,506	9,663,373	9,852,721

- (1) Production costs are lifting costs incurred to operate and maintain productive wells and related equipment and facilities including costs such as operating labor, materials, supplies, and fuel consumed in operations and the costs of operating natural gas liquids plants. In addition, they include expenses related to the asset retirement obligations that were recognized during 2020, 2019 and 2018 of COP\$213,925, COP\$198,394 and COP\$187,340, respectively.
- (2) In accordance with IAS 37, the expense related to asset retirement obligations that were recognized during 2020, 2019 and 2018 in depreciation, depletion and amortization, were COP\$639,123, COP\$272,147 and COP\$180,193, respectively.
- (3) Includes transportation costs and naphtha that are not part of the Ecopetrol Business Group's lifting cost.
- (4) Exploration expenses include the costs of geological and geophysical activities, as well as the non-productive exploratory wells.
- (5) Corresponds to administration, marketing expenses and impairment.

During 2020, 2019 and 2018, the Ecopetrol Business Group transferred approximately 18.9%, 21.6% and 22.9%, respectively, of its crude oil and gas production; (percentages based on the value sales in Colombian pesos) to intercompany business units. Those transfers were 45.9%, 51.5% and 51.8%, respectively, of crude oil and gas production volume (including Reficar).

The intercompany transfers were realized at market prices.

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35.4 Reserve information

The Ecopetrol Business Group follows international standards for estimating, classifying and reporting reserves framed under SEC definitions. Corporate Reserve Management of Ecopetrol, Upstream Management and the Vice-Presidency of Development and Production, present the reserves balance to the Board of Directors for approval.

The reserves were estimated at a level of 99% by specialized firms: DeGolyer and MacNaughton, Ryder Scott Company, Gaffney Cline & Associates, Sproule International Limited and Netherland, Sewell & Associates, Inc. According to these certifications the reserves report complies with the content and guidelines set forth in Rule 4-10 of Regulation S-X issued by the United States SEC.

The following information relates to the net proven reserves owned by the Ecopetrol Business Group in 2020, 2019 and 2018, and corresponds to the official reserves statements prepared by the Ecopetrol Business Group:

	2020			2019			2018		
	Oil (Mbls)	Gas (Gpc)	Total (Mbe)	Oil (Mbls)	Gas (Gpc)	Total (Mbe)	Oil (Mbls)	Gas (Gpc)	Total (Mbe)
Proved reserves:									
Opening balance	1,384	2,906	1,894	1,200	3,002	1,727	1,088	3,254	1,659
Revisions of previous estimates(1)	(81)	51	(72)	75	51	84	121	(4)	121
Improved recovery	100	74	113	94	3	94	128	4	129
Purchases	-	171	30	142	126	164	—	—	—
Extensions and discoveries	41	8	42	66	2	67	54	18	57
Sales	(0.9)	(0.3)	(1)	—	—	—	—	—	—
Production	(186)	(289)	(236)	(193)	(278)	(242)	(191)	(270)	(239)
Closing balance	1,257	2,921	1,770	1,384	2,906	1,894	1,200	3,002	1,727
<i>Proved developed reserves:</i>									
Opening balance	898	2,662	1,365	883	2,882	1,389	818	3,158	1,372
Closing balance	834	2,636	1,297	898	2,662	1,365	883	2,882	1,389
<i>Proved undeveloped reserves:</i>									
Opening balance	486	244	529	317	119	338	270	96	287
Closing balance	423	285	473	486	244	529	317	119	338

Some values were rounded for presentation purposes.

- (1) Represents changes in previous proved reserves, upward or downward, resulting from new information (except for an increase in a proved area), usually obtained from development drilling and production history or result from changes in economic factors.

For additional information about the changes in Proved Reserves and the process for estimating reserves, see section 3.1 – Oil and Gas Reserves.

35.5 Standardized measure of discounted future net cash flows relating to proved oil and gas quantities and changes therein

The standardized measure of discounted future net cash flows related to the above proved crude oil and natural gas reserves is calculated in accordance with the requirements of ASU 2010-03. Estimated future cash inflows from production under SEC requirements are computed by applying unweighted arithmetic average of the first-day-of-the-month for oil and gas price to year-end quantities of estimated net proved reserves, with cost factors based on those at the end of each year, currently enacted tax rates and a 10% annual discount factor. In our view, the information so calculated does not provide a reliable measure of future cash flows from proved reserves, nor does it permit a realistic comparison to be made of one entity with another because the assumptions used cannot reflect the varying circumstances within each entity. In addition, a substantial but unknown proportion of future real cash flows from oil and gas production activities is expected to derive from reserves which have already been discovered, but which cannot yet be regarded as proved.

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	2020	2019	2018
Future cash inflows	187,210,379	279,722,107	275,046,421
Future costs			
Production (1)	(85,989,384)	(93,589,960)	(90,176,326)
Development	(28,752,131)	(32,734,702)	(21,945,453)
Income taxes	(13,470,352)	(37,077,231)	(41,102,015)
Future net cash flow	58,998,512	116,320,214	121,822,627
10% discount factor	(18,568,308)	(36,934,889)	(35,518,187)
Standardized measure of discounted net cash flows	40,430,204	79,385,325	86,304,440

(1) Production future costs include the estimated costs related to assets retirement obligations in the amount of \$12,545,574; \$10,665,315 and \$10,164,941 as of December 31, 2020, 2019, and 2018, respectively.

The following are the principal sources of change in the standardized measure of discounted net cash flows in 2020, 2019 and 2018:

	2020	2019	2018
Net change in sales and transfer prices and in production cost (lifting) related to future production	(44,482,725)	2,411,040	79,632,263
Changes in estimated future development costs	(5,401,560)	(12,627,361)	(13,141,340)
Sales and transfer of oil and gas produced, net of production costs	(24,413,621)	(44,297,989)	(43,090,467)
Net change due to extensions, discoveries and improved recovery	3,134,469	7,061,712	8,496,249
Net change due to purchase and sales of minerals in place	570,460	213,539	—
Net change due to revisions in quantity estimates	(3,414,649)	6,756,418	10,163,131
Previously estimated development costs incurred during the period	7,943,239	23,200,357	12,505,421
Accretion of discount	10,468,951	11,542,289	6,771,897
Timing and other	567,027	(4,993,389)	(13,633,228)
Net change in income taxes	16,073,288	3,814,269	(12,616,331)
Aggregate change in the standardized measure of discounted future net cash flows for the year	(38,955,121)	(6,919,115)	35,087,595

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Exhibit 1 – Consolidated subsidiaries, associates and joint ventures

Consolidated subsidiary companies (1/2)

Company	Functional currency	Ownership interest Ecopetrol	Activity	Country/ Domicile	Geographic area of operations	Equity	Profit (loss) of the year	Total assets	Total liabilities
Refinería de Cartagena S.A.S.	U.S. dollar	100%	Refining of hydrocarbons, commercialization and distribution of products	Colombia	Colombia	16,582,279	(1,688,830)	27,321,381	10,739,102
Cenit Transporte y Logística S.A.S. (*)	Colombian peso	100%	Storage and transport by pipelines of hydrocarbons	Colombia	Colombia	16,310,718	4,696,705	18,303,490	1,992,772
Ecopetrol Global Energy S.L.U.	U.S. dollar	100%	Investment vehicle	Spain	Spain	9,320,715	(434,773)	9,321,078	363
Ecopetrol USA Inc.	U.S. dollar	100%	Exploration and exploitation of hydrocarbons	United States	United States	7,550,468	(294,497)	7,552,294	1,826
Ecopetrol Permian LLC.	U.S. dollar	100%	Exploration and exploitation of hydrocarbons	United States	United States	3,566,413	(38,855)	3,590,934	24,521
Hocol Petroleum Limited	U.S. dollar	100%	Investment vehicle	Bermuda	Bermuda	3,444,262	314,057	3,444,326	64
Oleoducto Central S. A. - Ocesa	U.S. dollar	72.65%	Transportation by crude oil pipelines	Colombia	Colombia	3,012,894	2,528,350	6,277,969	3,265,075
Hocol S.A.	U.S. dollar	100%	Exploration, exploitation and production of hydrocarbons	Cayman Islands	Colombia	2,376,723	300,828	3,877,096	1,500,373
Ecopetrol América LLC.	U.S. dollar	100%	Exploration and exploitation of hydrocarbons	United States	United States	2,320,615	(353,806)	2,749,860	429,245
Esenttia S.A.	U.S. dollar	100%	Production and commercialization of polypropylene resin	Colombia	Colombia	1,870,802	263,126	2,445,757	574,955
Ecopetrol Capital AG	U.S. dollar	100%	Collection of surpluses from, and providing funds to, companies of the Ecopetrol Business Group.	Switzerland	Switzerland	1,872,129	176,999	7,482,055	5,609,926
Ecopetrol Oleo é Gas do Brasil Ltda.	Brazilian real	100%	Exploration and exploitation of hydrocarbons	Brazil	Brazil	1,657,410	(95,164)	1,692,673	35,263
Oleoducto Bicentenario de Colombia S.A.S.	Colombian peso	55.97%	Transportation by crude oil pipelines	Colombia	Colombia	1,621,598	214,482	3,577,534	1,955,936
Andean Chemicals Ltd.	U.S. dollar	100%	Investment vehicle	Bermuda	Bermuda	1,268,047	(163,877)	1,268,327	280
Oleoducto de los Llanos Orientales S. A. - ODL	Colombian peso	65%	Transportation by crude oil pipelines	Panama	Colombia	1,047,791	444,625	1,465,305	417,514
Black Gold Re Ltd.	U.S. dollar	100%	Reinsurer for companies of the Ecopetrol Business Group	Bermuda	Bermuda	837,693	54,412	1,079,572	241,879

(*) Includes the effect of unrealized profits from transactions of companies in the transport and logistics segment.

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Consolidated subsidiaries (2/2)

Company	Functional currency	Ownership interest Ecopetrol	Activity	Country/ Domicile	Geographic area of operations	Equity	Profit (loss) of the year	Total assets	Total liabilities
Inversiones de Gases de Colombia S.A.			Holding with investments in natural gas and LPG						
Invercolsa S.A. y subsidiarias	Colombian peso	51.88%	transportation and distribution companies in Colombia	Colombia	Colombia	765,720	176,865	1,311,588	545,868
Oleoducto de Colombia S.A. – ODC	Colombian peso	73%	Transportation by crude oil pipelines	Colombia	Colombia	411,180	353,424	640,292	229,112
Esenttia Masterbatch Ltda	Colombian peso	100%	Manufacture of polypropylene compounds and masterbatches	Colombia	Colombia	322,511	166,911	401,404	78,893
ECP Hidrocarburos de México S.A. de C.V.	U.S. dollar	100%	Offshore exploration	Mexico	Mexico	59,279	(44,010)	124,237	64,958
Ecopetrol del Perú S.A.	U.S. dollar	100%	Exploration and exploitation of hydrocarbons	Peru	Peru	53,003	305	55,202	2,199
Bioenergy S.A.S. (1)	Colombian peso	99.61%	Production of biofuels	Colombia	Colombia	26,508	(20,248)	194,257	167,749
Ecopetrol Costa Afuera S.A.S.	Colombian peso	100%	Offshore exploration	Colombia	Colombia	13,356	1,148	32,017	18,661
Ecopetrol Energía S.A.S E.S.P.	Colombian peso	100%	Energy supply service	Colombia	Colombia	12,661	5,256	72,859	60,198
Esenttia Resinas del Perú SAC	U.S. dollar	100%	Commercialization polypropylene resins and masterbatches	Peru	Peru	6,275	1,319	39,833	33,558
Topili Servicios Administrativos S de RL de CV	Mexican peso	100%	Specialized management services	Mexico	Mexico	16	(35)	20	4
Kalixpan Servicios Técnicos S de RL de CV	Mexican peso	100%	Specialized services related to oil and gas industry	Mexico	Mexico	20	(31)	24	4
Bioenergy Zona Franca S.A.S. (1)	Colombian peso	99.61%	Production of biofuels	Colombia	Colombia	(92,416)	(2,850)	361,769	454,185

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Associated companies and joint ventures

Company	Functional currency	Ownership interest Ecopetrol	Activity	Country/ Domicile	Geographic area of operations	Equity	Profit (loss) of the year	Total assets	Total liabilities
Joint ventures									
Equion Energía Limited	U.S. dollar	51%	Exploration, exploitation and production of hydrocarbons	United Kingdom	Colombia	2,499,319	167,727	2,630,351	131,032
Offshore International Group Inc.	U.S. dollar	50%	Exploration, exploitation and production of hydrocarbons	United States	Peru	543,621	(237,752)	1,568,795	1,025,174
Ecodiesel Colombia S.A. (2)	Colombian peso	50%	Production, commercialization and distribution of biofuels and oleochemicals	Colombia	Colombia	103,344	29,188	167,801	64,457
Associates									
Gases del Caribe S.A. E.S.P.	Colombian peso	25,40%	Natural gas distribution and commercialization	Colombia	Colombia	489,367	278,329	2,132,231	1,642,864
Gas Natural del Oriente S.A. E.S.P.	Colombian peso	17,91%	Natural gas distribution and commercialization	Colombia	Colombia	111,181	52,956	202,644	91,463
Gases de la Guajira S.A. E.S.P.	Colombian peso	5,36%	Natural gas distribution and commercialization	Colombia	Colombia	55,265	18,128	170,937	115,672
Colombiana de Extrusión S.A. - Extrucol S.A.	Colombian peso	18,16%	Production of pipes and accessories in polyethylene	Colombia	Colombia	39,620	7,493	66,110	26,490
E2 Energía Eficiente S. A. E.S.P.	Colombian peso	9,92%	Energy services, supply, optimization, development, renewal and innovation of energy resources and infrastructure	Colombia	Colombia	28,802	4,062	93,736	64,934
Serviport S.A. (3)	Colombian peso	49%	Services for the support of loading and unloading of oil ships, supply of equipment, technical inspections and load measurements	Colombia	Colombia	17,430	568	45,457	28,027
Sociedad Portuaria Olefinas y Derivados S.A. (2)	Colombian peso	50%	Construction, use, maintenance and administration of port facilities, ports, private docks	Colombia	Colombia	4,432	562	8,196	3,764

(1) Companies in liquidation process. See Note 2.2 Basis for consolidation.

(2) Information available as of November 30, 2020.

(3) Information available as of September 30, 2020, The investment is 100% impaired.

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Exhibit 2 – Conditions of the most significant debt

Type of debt	Company	Issue date	Maturity date	Currency	Disbursement	Outstanding balance Dec 31, 2020	Outstanding balance Dec 31, 2019	Interest rate	Amortization plan	Payment of interest
Bonds, domestic currency	Ecopetrol S.A.	Dec-10	Dec-40	COP	479,900	—	479,900	Floating	Bullet	Half-yearly
		Dec-10	Dec-40	COP	284,300	284,300	284,300	Floating	Bullet	Half-yearly
		Aug-13	Aug-23	COP	168,600	168,600	168,600	Floating	Bullet	Half-yearly
		Aug -13	Aug-28	COP	347,500	347,500	347,500	Floating	Bullet	Half-yearly
		Aug -13	Aug-43	COP	262,950	262,950	262,950	Floating	Bullet	Half-yearly
Syndicated commercial loan, domestic currency	Oleoducto Bicentenario S.A.S	Jul-12	Jul-24	COP	2,100,000	800,450	999,950	Floating	Quarterly	Quarterly
Syndicated commercial loan, domestic currency	Oleoducto de los Llanos Orientales S.A.	Aug -13	Aug-20	COP	800,000	—	96,000	Floating	Quarterly	Quarterly
		Nov-20	Aug-25	COP	110,000	110,000	—	Floating	Half-yearly	Half-yearly
Commercial loan	Inversiones de Gases de Colombia S.A. Invercolsa S.A. and subsidiaries	Aug-20	Aug-21	COP	50,000	43,000	—	Floating	Bullet	Quarterly
		Sep-19	Jul-25	COP	70,912	21,681	70,912	Floating	Half-yearly	Half-yearly
		Sep-13	Sep-23	USD	1,300	1,300	1,300	Fixed	Bullet	Half-yearly
		Sep-13	Sep-43	USD	850	850	850	Fixed	Bullet	Half-yearly
Bonds, foreign currency	Ecopetrol S.A.	May-14	May-45	USD	2,000	2,000	2,000	Fixed	Bullet	Half-yearly
		Sep-14	May-25	USD	1,200	1,200	1,200	Fixed	Bullet	Half-yearly
		Jun-15	Jun-26	USD	1,500	1,500	1,500	Fixed	Bullet	Half-yearly
		Jun-16	Sep-23	USD	500	500	500	Fixed	Bullet	Half-yearly
		Apr-20	Apr-30	USD	2,000	2,000	2,000	Fixed	Bullet	Half-yearly
	Oleoducto Central S.A. (1)	May-14	May-21	USD	500	500	500	Fixed	Bullet	Half-yearly
		Jul-20	Jul-27	USD	500	500	500	Fixed	Bullet	Half-yearly
Committed credit line	Ecopetrol S.A.	Apr-20	Sep-23	USD	665	665	—	Floating	Bullet	Half-yearly
		Dec-17	Dec-27	USD	2,001	1,305	1,530	Fixed	Half-yearly	Half-yearly
		Dec-17	Dec-27	USD	76	49	58	Floating	Half-yearly	Half-yearly
International commercial loans (2)	Ecopetrol S.A.	Dec-17	Dec-27	USD	73	48	56	Fixed	Half-yearly	Half-yearly
		Dec-17	Dec-27	USD	159	103	121	Floating	Half-yearly	Half-yearly
		Dec-17	Dec-25	USD	359	257	288	Floating	Half-yearly	Half-yearly

(1) This bond was redeemed early in 2020.

(2) Debt originally obtained by Reficar for the Refinery modernization and voluntarily assumed by Ecopetrol.

9. **Signature Page**

SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this annual report on its behalf.

Ecopetrol S.A.

By: /s/ Jaime Caballero Uribe
Name: Jaime Caballero Uribe
Title: Acting Chief Executive Officer

By: /s/ Sebastian Castañeda Arbelaez
Name: Sebastian Castañeda Arbelaez
Title: Acting Chief Financial Officer

Dated: April 8, 2021

10. **Exhibits**

Exhibit No.	Description
<u>1.1</u>	<u>Amended and Restated Bylaws of Ecopetrol S.A., dated March 26, 2021 (English Translation).</u>
<u>2.1</u>	<u>Form of Deposit agreement between Ecopetrol, JPMorgan Chase Bank as depository, and the holders from time to time of ADSs (incorporated by reference to Exhibit 99.A to our registration statement on Form F-6 filed with the U.S. Securities and Exchange Commission on December 29, 2017 (File No. 333-222378).</u>
<u>4.1</u>	<u>Transportation Agreement between Ecopetrol S.A. and Oleoducto Central S.A., dated March 31, 1995 (incorporated by reference to Exhibit 4.1 on Form 20-F filed with the U.S. Securities and Exchange Commission on September 12, 2008 (File No. 001-34175)) (English Translation).</u>
<u>4.2</u>	<u>Supplementary Agreement to Transportation Agreement between Ecopetrol S.A. and Oleoducto Central S.A., dated January 17, 2013 (incorporated by reference to Exhibit 4.2 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 29, 2013 (File No. 001-34175)) (English Translation).</u>
<u>4.3</u>	<u>Natural Gas Transportation Agreement between Ecopetrol S.A. and Transportadora de Gas del Interior S.A. ESP, dated October 1, 2008 (incorporated by reference to Exhibit 4.3 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 29, 2013 (File No. 001-34175)) (English Translation).</u>
<u>4.4</u>	<u>Supplementary Agreement No. 1, dated December 5, 2008, to the Natural Gas Transportation Agreement between Ecopetrol S.A. and Transportadora de Gas del Interior S.A. ESP, dated October 1, 2008 (incorporated by reference to Exhibit 4.4 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 29, 2013 (File No. 001-34175)) (English Translation).</u>
<u>4.5</u>	<u>Supplementary Agreement No. 2, dated April 11, 2012, to the Natural Gas Transportation Agreement between Ecopetrol S.A. and Transportadora de Gas Internacional S.A. E.S.P., dated October 1, 2008 (incorporated by reference to Exhibit 4.5 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 29, 2013 (File No. 001-34175)) (English Translation).</u>
<u>4.6</u>	<u>Crude Oil Transportation Services Agreement between Ecopetrol S.A. and Cenit Transporte y Logística de Hidrocarburos S.A.S., dated April 1, 2013 (incorporated by reference to Exhibit 4.6 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 29, 2013 (File No. 001-34175)) (English Translation).</u>
<u>4.7</u>	<u>Refined Products Transportation Services Agreement between Ecopetrol S.A. and Cenit Transporte y Logística de Hidrocarburos S.A.S., dated April 1, 2013 (incorporated by reference to Exhibit 4.7 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 29, 2013 (File No. 001-34175)) (English Translation).</u>
<u>4.8</u>	<u>Bicentenario Transport Contract between Oleoducto Bicentenario de Colombia S.A.S. and Ecopetrol S.A., dated June 20, 2012 incorporated by reference to Exhibit 4.9 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 25, 2014 (File No. 001-34175)) (English Translation).</u>
<u>4.9</u>	<u>Supplementary Agreement No. 2, dated March 28, 2014, to the Bicentenario Transport Contract between Oleoducto Bicentenario de Colombia S.A.S. and Ecopetrol S.A., dated June 20, 2012 (incorporated by reference to Exhibit 4.11 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 28, 2016 (File No. 001-34175)) (English Translation).</u>
<u>4.10</u>	<u>Supplementary Agreement No. 4, dated April 6, 2015, to the Bicentenario Transport Contract between Oleoducto Bicentenario de Colombia S.A.S. and Ecopetrol S.A., dated June 20, 2012 (incorporated by reference to Exhibit 4.12 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 28, 2016 (File No. 001-34175)) (English Translation).</u>
<u>4.11</u>	<u>Amendment No. 6, dated April 25, 2016, to the Crude Oil Transportation Services Agreement between Ecopetrol S.A. and Cenit Transporte y Logística de Hidrocarburos S.A.S., dated April 1, 2013 (incorporated by reference to Exhibit 4.13 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 5, 2019 (File No. 001-34175)) (English Translation).</u>

Exhibit No.	Description
<u>4.12</u>	<u>Amendment No. 7, dated December 28, 2016, to the Crude Oil Transportation Services Agreement between Ecopetrol S.A. and Cenit Transporte y Logística de Hidrocarburos S.A.S., dated April 1, 2013 (incorporated by reference to Exhibit 4.14 on Form 20-F filed with the U.S. Securities and Exchange Commission on April 5, 2019 (File No. 001-34175)) (English Translation).</u>
<u>4.13</u>	<u>Indenture, dated as of July 23, 2009, between the Company and The Bank of New York Mellon, as trustee (incorporated by reference to Exhibit 4.2 to the Company's Form F-4 filed with the U.S. Securities and Exchange Commission on July 31, 2009 (File No. 333-160965)).</u>
<u>4.14</u>	<u>Amendment No. 1 to the Indenture, dated as of June 26, 2015, between the Company and The Bank of New York Mellon, as trustee (incorporated by reference to Exhibit 4.10 on Form 6-K of the Company furnished to the U.S. Securities and Exchange Commission on June 25, 2015 (File No. 001-34175)).</u>
<u>4.15</u>	<u>Prospectus Supplement relating to Ecopetrol S.A.'s 5.875% Notes due 2023 (incorporated by reference to the Company's Prospectus Supplement filed with the U.S. Securities and Exchange Commission on September 11, 2013 (File No. 333-190198)).</u>
<u>4.16</u>	<u>Prospectus Supplement relating to Ecopetrol S.A.'s 4.125% Notes due 2025, (incorporated by reference to the Company's Prospectus Supplement filed with the U.S. Securities and Exchange Commission on September 9, 2014 (File No. 333-190198)).</u>
<u>4.17</u>	<u>Prospectus Supplement relating to Ecopetrol S.A.'s 5.375% Notes due 2026 (incorporated by reference to the Company's Prospectus Supplement filed with the U.S. Securities and Exchange Commission on June 23, 2015 (File No. 333-190198)).</u>
<u>4.18</u>	<u>Prospectus Supplement relating to Ecopetrol S.A.'s 7.375% Notes due 2043 (incorporated by reference to the Company's Prospectus Supplement filed with the U.S. Securities and Exchange Commission on September 11, 2013 (File No. 333-190198)).</u>
<u>4.19</u>	<u>Prospectus Supplement relating to Ecopetrol S.A.'s 5.875% Notes due 2045 (incorporated by reference to the Company's Prospectus Supplement filed with the U.S. Securities and Exchange Commission on May 20, 2014 (File No. 333-190198)).</u>
<u>4.20</u>	<u>Prospectus Supplement relating to Ecopetrol S.A.'s 6.875% Notes due 2030 (incorporated by reference to the Company's Prospectus Supplement filed with the U.S. Securities and Exchange Commission on April 27, 2020 (File No. 333-225381)).</u>
<u>8.1</u>	<u>List of subsidiaries of Ecopetrol S.A.</u>
<u>12.1</u>	<u>Section 302 Certification of the Chief Executive Officer.</u>
<u>12.2</u>	<u>Section 302 Certification of the Chief Financial Officer.</u>
<u>13.1</u>	<u>Section 906 Officer Certification.</u>
<u>23.1</u>	<u>Consent of Ernst & Young Audit S.A.S.</u>
<u>23.2</u>	<u>Consent of Ryder Scott L.P.</u>
<u>23.3</u>	<u>Consent of Sproule International Limited.</u>
<u>23.4</u>	<u>Consent of DeGolyer and MacNaughton.</u>
<u>23.5</u>	<u>Consent of Gaffney, Cline & Associates.</u>
<u>23.6</u>	<u>Consent of Netherland, Sewell & Associates, Inc.</u>
<u>99.1</u>	<u>Third-Party Reserve Report of Ryder Scott Company, L.P.</u>
<u>99.2</u>	<u>Third-Party Reserve Report of Sproule International Limited.</u>
<u>99.3</u>	<u>Third-Party Reserve Report of DeGolyer and MacNaughton.</u>
<u>99.4</u>	<u>Third-Party Reserve Report of Gaffney, Cline & Associates.</u>
<u>99.5</u>	<u>Third-Party Reserve Report of Netherland, Sewell & Associates, Inc.</u>
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Labels Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

11. **Cross-reference to Form 20-F**

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