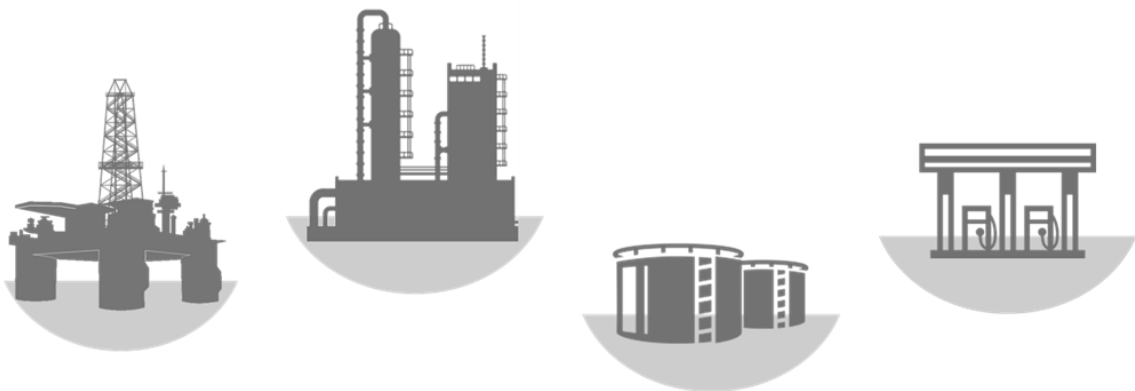




BRAZILIAN OIL & GAS REPORT

2020/2021

TRENDS AND RECENT DEVELOPMENTS



September 2021
Rio de Janeiro, Brazil



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List of Abbreviations

ANP – National Agency of Petroleum, Gas and Biofuels (Agência Nacional do Petróleo, Gás e Biocombustíveis)

BidSIM – Program for the Improvement of Tenders for the Oil and Natural Gas Exploration and Production (Programa para Aprimoramento das Licitações de Exploração e Produção de Petróleo e Gás Natural)

boe/d – barrels of oil equivalent per day

b/d – barrels per day

CADE – Administrative Council for Economic Defense (Conselho Administrativo de Defesa Econômica)

CBIO – Decarbonization Credit (Crédito de Descarbonização por Biocombustíveis)

CNODC – CNPC Exploration & Development Company

CNOOC - China National Offshore Oil Corporation

CNPE – National Energy Policy Council (Conselho Nacional de Política Energética)

E&P – Exploration and Production

EPE – Energy Research Office (Empresa de Pesquisa Energética)

Fafen - Nitrogenated Fertilizer Plant

FID – Final investment decision

FPSO – Floating Production Storage and Offloading Unit

IMO – International Maritime Organization

IOC – International Oil Company

LDC – Local Distribution Company

LPG – Liquefied Petroleum Gas

LUBNOR – Lubrificantes e Derivados de Petróleo do Nordeste

MME – Ministry of Mines and Energy (Ministério de Minas e Energia)

NTS – Nova Transportadora do Sudeste

PPSA – Pré-Sal Petróleo S.A.

PSC – Production Sharing Contract (Contrato de Partilha de Produção)

Refap – Alberto Pasqualini Refinery

Regap – Gabriel Passos Refinery

Repar – Presidente Getúlio Vargas Refinery

Replan – Paulínia Refinery

RLAM – Landulpho Alves Refinery

Reman – Isaac Sabbá Refinery

RNEST - Abreu e Lima Refinery

SIN - National Interconnected System

SIX - Shale Industrialization Unit

TAG – Transportadora Associada de Gás

TBG – Transportadora Brasileira Gasoduto Bolívia-Brasil

TCC – Term of Commitment for Termination of Practice (Termo de Compromisso de Cessação)

ToR – Transfer-of-Rights (Cessão Onerosa)

YPFB – Yacimientos Petrolíferos Fiscales Bolivianos

Introduction

The Brazilian Oil & Gas Report is an annual publication, whose purpose is to outline the sector's trends and developments from July 2020 to June 2021. Facts that happened after June 2021 are not in the scope of this report.

The Covid-19 pandemic had a considerable impact on Brazilian oil and gas demand, affecting investments in the sector. However, over the last two semesters the economy recovered, with demand coming very close to its previous peaks, even with air transport and mobility still lagging.

Worldwide the pandemic has hit upstream investments hard. This was not the case for Brazil. Investments and production did momentarily decline in the beginning of the pandemic, but recovered quickly, especially investments. In the context of Petrobras' divestment program, the state-owned company reorganized its portfolio, shut or put on sale many of its smaller and less productive fields, leading to a decline in total national production. However, these fields have or are being sold to private players that are starting to invest to revert recent declines. Meanwhile, Petrobras and other *majors* are announcing record investments in pre-salt fields, even while investments elsewhere are still lagging. This is led by relatively low development costs, low carbon intensity of the production, high field productivities and oil with low-Sulphur high middle-distillate output. The reduction in requirements is also driving interest in upcoming licensing rounds. A series of successful licensing rounds in the past few years, in addition to declining costs in the pre-salt, and investments already committed, should guarantee a considerable boost in production over the next decade.

The Brazilian natural gas regulatory framework had important changes after the New Gas Law (Law No. 14,134 of April 8th, 2021 and its Decree No. 10,712 of June 2nd, 2021) promulgation, which established guidelines for the natural gas transport, import and export activities. It also oriented the natural gas activities of outflow, treatment, processing, underground storage, conditioning, liquefaction, regasification and commercialization. This led to, for example, new companies starting to operate and others diversifying its activities, which helps the development of natural gas infrastructure projects. In the context of Petrobras' divestment program advance, one important discussion in progress is third-party access to essential facilities, with some interested companies suggesting creating a new midstream company responsible to manage gas flows and processing activities. New LNG terminal projects at the states of Pará (North), Pernambuco (Northeast), São Paulo (Southeast) and Santa Catarina (South) also progressed on their schedules.

The oil sector's mid- and downstream is also undergoing changes. Petrobras's refinery divestments were delayed by the pandemic, but have overcome all the necessary hurdles, resulting in the completion of the sale of two out of eight refineries. Once completed, these divestments are expected to stimulate other market participants to invest in new maritime terminals, pipelines and railways. This investment is needed to support Brazil's growing fuel demand, as per capita income increases. Players have started committing resources to infrastructure, and even more investments are expected over the next few years.

Economic activity and fuel demand are almost recovered, even though a new Covid 19 infection spike did temporarily reverse the growth trend in the beginning of 2021. Brazilian economy is expected to keep growing over time, as projects in oil and gas and transport infrastructure start recovering employment and investments. This, in turn, is likely to stimulate the local industry. Brazil's oil and gas sector is particularly important and is expected not to be affected by the pandemic in the long term. Prolific oil and gas reserves, declining exploration costs, increasing domestic demand, combined with more competitive and investor-friendly markets and legal security, should allow existing prospects for the country's oil and gas industry to materialize.

Upstream

The last two semesters challenged the Brazilian Oil and Gas sector. Global oil demand was severely affected by the Covid 19 pandemic, crashing oil prices. These remained at historically low levels over much of 2020. Oil companies were suddenly forced to reevaluate their cash flow, production goals and investment decisions. After reaching a record high production in January 2020 (3.2 million b/d of oil and 138 million m³/d of natural gas), restrictions caused by the coronavirus outbreak drove Brazil's production down in 2020 (2.9 million b/d of oil and 128 million m³/d of natural gas) ([ANP](#)). As of June 2021, production levels remain very close to the 2020 average, at 2.9 million b/d and 136 million m³/d of oil and gas ([ANP](#)).

The licensing rounds scheduled for 2020 had to be delayed, as the coronavirus outbreak generated uncertainty and investment restraint. However, these have already been rescheduled for 2021 and 2022, including the 17th and 18th Concession Licensing Rounds and the 2nd Production Sharing Bidding Round for surplus volumes to those contracted under the Transfer-of-Rights regime (ToR) ([EPE](#)), as can be seen in Table 1. In order to increase the competitiveness and attractiveness of the areas to be offered in future bidding rounds, the Federal Decree nº 10,320/2020 instituted the Program for the Improvement of Tenders for the Oil and Natural Gas Exploration and Production (*Programa para Aprimoramento das Licitações de Exploração e Produção de Petróleo e Gás Natural* - BidSIM) ([Brasil](#)).

Table 1 - Licensing rounds schedule for 2021 and 2022 in Brazil

Round	Date	Description
17th Concession Licensing Round	October/2021	92 <i>offshore</i> blocks in Campos, Pelotas, Potiguar and Santos basins
2nd Transfer-of-Rights surplus Licensing Round	December/2021	Surplus volumes in the Sépia and Atapu fields
18th Concession Licensing Round	2022	<i>Offshore</i> blocks in Ceará, Pelotas and Espírito Santo basins
7th and 8th Production Sharing Licensing Round	Not defined	Pre-salt blocks in Campos and Santos basins

Source: Adapted from [ANP](#)

The 2nd ToR surplus Licensing Round was authorized by the National Energy Policy Council (*Conselho Nacional de Política Energética* - CNPE), for the oilfields Atapu and Sépia. These two fields had been offered on November 2019, but failed to attract bids, which prompted the Government to rethink the whole process, leading to changes that increased the attractiveness of the future bidding rounds, especially after the pandemic. Previously, the winner of the bid would have had to negotiate the compensation for investments already paid for by Petrobras after winning the tender, which increased uncertainty. Therefore, the Federal Government decided that PPSA, the state-owned entity responsible for controlling the government's stakes in Production Sharing Contracts (PSC), would negotiate this investment compensation with Petrobras ahead of new tenders. An agreement between Petrobras and the Federal Government defined a financial compensation of US\$ 6.5 billion to be paid by the bidding winner to the company, as a deferral of the cash flow and as a compensation for the investment already done in these two oil fields (Earn-out) ([MME](#)) ([Petrobras](#)) ([MME](#)) ([MME](#)) ([MME](#)). The co-participation contract has also been disciplined by the Ministry, and the draft agreement regulating this partnership is to be published together with the auction notice, increasing the predictability of the auction ([MME](#)). Atapu and Sépia also have operational producing modules now, which reduces uncertainty significantly. In addition, hefty signing bonuses and government shares had been a complaint. Signing bonuses for Sépia were reduced from R\$ 22.9 billion to R\$ 7.1 billion, and for Atapu from R\$ 13.7 to R\$ 4.0 billion, while minimum-profit oil was reduced from 27.8% to 15.0% in Sépia, and from 26.3% to 5.8% in Atapu. The new parameters for the 2nd ToR surplus Bidding Round can be seen in Table 2 ([ANP](#)).

Table 2 - Parameters for the 2nd ToR surplus Bidding Round

Fields	Signing Bonus	Minimum Profit Oil
Sépia	US\$ 1.4 billion (R\$ 7.1 billion)	15.02%
Atapu	US\$ 0.8 billion (R\$ 4.0 billion)	5.89%

Source: Adapted from [ANP](#)

Atapu's floating production storage and offloading unit (FPSO) was ramping up quickly all through the past months, reaching its capacity of 161 thousand b/d in July after 13 months. The capacity was reached even though only 4 producing wells had been connected ([Petrobras](#)). In this context, Petrobras manifested its interest in exercising its preferential right in both fields in the future bidding round, guaranteeing the operation and a minimum stake of 30% ([Petrobras](#)). The licensing round is expected to happen in December 2021 ([ANP](#)).

The 17th Concession Bidding Round is scheduled for October 2021, and will comprise 92 blocks for lease in the offshore sedimentary basins of Pelotas, Potiguar, Campos and Santos ([MME](#)). The 18th Concession Bidding Round is scheduled for 2022, and will offer exploratory blocks in the Ceará and Pelotas basins, and blocks in ultradeep waters in the Espírito Santo Basin, outside the Pre-salt Polygon ([ANP](#)). The 7th and 8th Production Sharing Licensing Rounds, postponed in early 2020, still have no defined timeline. This round will offer areas in the Campos and Santos basins, in the Pre-salt Polygon ([ANP](#)). A summary of past and upcoming rounds can be seen in Figure 1.



Figure 1 – Summary of Brazilian licensing rounds

Source: Adapted from [ANP](#)

In December 2020, the government conducted the 2nd cycle of the Open Acreage¹, with companies bidding for relinquished fields on permanent offer. 17 exploratory blocks in the offshore basin of Sergipe-Alagoas and the onshore basins of Amazonas, Campos, Espírito Santo, Paraná, Potiguar and Tucano were awarded. These areas, which total roughly 20,000 km², received US\$ 6.1 million in signing bonuses, and minimum exploratory commitment of US\$ 31 million in investments ([ANP](#)). A 3rd cycle of Open Acreage is being planned, with an updated bidding notice that will include 377 exploratory blocks for concession that were not part of the 2nd cycle, increasing the total available to 1,068 ([ANP](#)).

Although the global situation restrained the oil and gas production growth in 2020 and postponed licensing rounds, important developments happened in the Brazilian upstream. Petrobras announced hydrocarbons discovered in a wildcat well drilled in block C-M-411² ([Petrobras](#)) and block C-M-657, in the Naru prospect ([Petrobras](#)), and concluded formation tests in the area of Júpiter, part of the BM-S-24 concession, in the Santos Basin³ ([Petrobras](#)). However, some unsuccessful exploratory drilling led to the devolution of areas Peroba ([EPBR](#)) and Sudeste de Libra ([Petrobras](#)). The beginning of production in the field of Mero was postponed to 2022 ([Petrobras](#)). In the Parnaíba Basin, Eneva announced the commerciality of Fortuna accumulation, with estimates of 6.8 billion m³ of gas-in-place ([Eneva](#)).

Petrobras also reported an oil discovery in a well drilled in the northwest of the Búzios field ([Petrobras](#)), a giant field with significant importance in the company's portfolio. When production development is complete, 12 FPSOs will operate in the area⁴. Currently, Petrobras is carrying out tender processes for three FPSOs for the Búzios field, with start-ups estimated between 2024 and 2026 ([Petrobras](#)).

Petrobras is not the only company that has been investing in Brazil. Equinor took its final investment decision (FID) for a FPSO for the Bacalhau field and contracted a drill ship for more wells ([Modec](#); [Equinor](#)). ExxonMobil is licensing 11 exploratory wells in the Sergipe-Alagoas Basin, and plans to start drilling in 2S2021 ([ExxonMobil](#); [EPBR](#)). Karoon Energy plans to invest up to US\$ 300 million in investments until 2023 in its Baúna field ([Karoon](#)).

¹ The Open Acreage licensing round is the permanent offer of exploratory blocks and marginal areas located in onshore and offshore basins, excluding those situated in the Pre-salt Polygon, strategic areas, outside the 200 nautical miles limit or blocks scheduled to be offered in the 18th Concession Licensing Round. The Open Acreage objective is to allow oil companies to geologically study areas without the limiting timeframes of traditional licensing rounds ([ANP](#)).

² The block is operated by Petrobras, that owns 50% of the asset. ExxonMobil owns the remaining 50% ([Petrobras](#)).

³ Petrobras reported the drilled well had outstanding productivity, with condensate oil of high aggregated value, with high flow rate ([Petrobras](#)).

⁴ Petrobras operates the consortium in Búzios field and owns a 90% stake, with partners CNOOC (5%) and CNODC (5%) ([Petrobras](#)).

These projects, despite uncertainties surrounding the pandemic, have been approved due to falling exploration costs and excellent well productivity. Petrobras and its partners' lifting costs have been declining steadily, in part due to an increased geological knowledge and operational experience, but also because of the high well productivity, and sale of mature fields. From 2015 to 2019, lifting costs were US\$ 9.0/boe. This fell to US\$ 7.8/boe in 2019, US\$ 5.2/boe in 2020, and US\$ 4.9/boe 2Q21. Pre-salt lifting costs reached US\$ 2.5/boe ([Petrobras](#); [Petrobras](#)). In June 2021, the 10 most productive well in Brazil had an average production of 56 thousand boe/d, and the 50 most productive wells 36 thousand boe/d, all of them in the Santos Basin ([ANP](#)). This explains the continued interest in assets in this region.

Pre-salt production accounted for over 72% of the Brazilian production in June 2021 ([ANP](#)) an ascending trend, explained by the high productivity of giant fields, such as Búzios and Tupi, in the Santos Basin⁵. Meanwhile, Campos Basin faces a decrease in production, as consequence of maturing fields, the deactivation of some platforms during the pandemic, and Petrobras divestments. Petrobras signed a contract with Baker Hughes for the provision of subsea equipment, like manifold systems and control modules in the areas of Marlim and Roncador, in Campos Basin, aiming to drive efficiencies up, reduce costs and improve execution speed ([Baker Hughes](#)). Figure 2 shows the evolution of Brazilian production since 2019 and the output changes in Campos and Santos Basin.

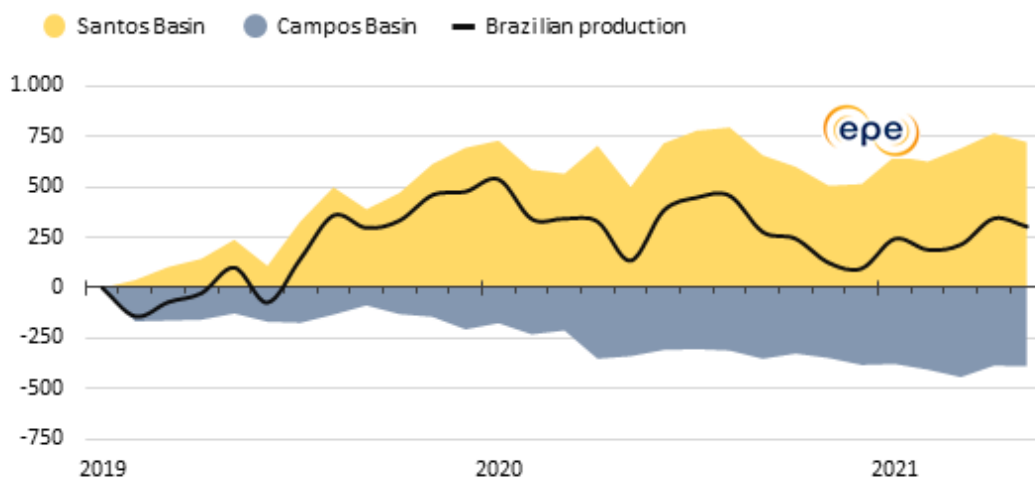


Figure 2 - National oil & gas production and accumulated monthly output change in Campos and Santos Basins since January 2019

Source: Adapted from [ANP](#)

⁵ Many service contracts and scheduled maintenance programs of producing fields were postponed in the outset of the pandemic. The pace of these shutdowns had returned to normal over 2021, which explains a reduction in the production of certain assets over the course of the year so far ([Valor](#)).

In November 2020, Petrobras released its new Strategic Plan 2021-2025. The plan reinforced its focus on world-class fields in deep waters and ultradeep waters, with high operational efficiency. Other key points of the Petrobras strategy are cost reduction, energy transition and the reduction of capital costs, in synergy with the company's divestment plan ([Petrobras](#)). Petrobras has continued to sell assets located onshore and in shallow waters, announcing teasers or the signature of contracts in producing areas in states such as Rio de Janeiro, Espírito Santo, Rio Grande do Norte, Sergipe and Bahia⁶ ([EPE](#)). The sale of mature fields is expected to attract companies specialized in these types of assets, willing to invest in order to enhance oil recovery and stem the decline rates of these fields⁷. Constrained for cash and with a focus on debt reduction, Petrobras had been focusing on new and more productive pre-salt fields, shifting away from mature fields. The resulting lack of investments accelerated their decline rates.

The Covid-19 pandemic hit the global oil market particularly hard in 2020, but since reaching bottom level in April 2020, Brent prices had a significant recovery, with prices rising from around US\$ 40/b in July 2020 to over US\$ 70/b in June 2021 ([EIA](#)).

In first semester of 2021 Brazil received royalties and special participation record values from the oil and gas industry. In May 2021, oil and gas royalties distribution was US\$ 0.7 billion (R\$ 3.3 billion), an increase of 150% compared to the same month in the previous year. Regarding the special participation, US\$ 1.8 billion (R\$ 9.14 billion) were collected in the first quarter of 2021, 69% higher than in the first quarter of 2020 ([ANP](#)).

Despite the context of recovery in oil prices, global demand and national production, the Government is working on initiatives to strengthen the Brazilian exploration and production. In order to recover the previous levels of activity in post-salt fields, the Ministry of Mines and Energy (MME) launched the PROMAR program, aiming to establish better conditions for the revitalization of offshore mature fields and improving the economic feasibility of producing oil in areas with marginal accumulations ([MME](#)) ([ANP](#)). In July 2020, the Federal Government sanctioned the CNPE Resolution nº 4/2020, with the objective of increasing the economic feasibility of new projects, establishing that ANP will adopt measures to reduce royalties from 10% to 5% for fields licensed to small or medium companies ([MME](#)).

⁶ Petrobras concluded, over the last 12 months, the divestment in the production areas of Pampo, Enchova, Pescada, Fazenda Belém, Cricaré, Rio Ventura, Lagoa Parda, Remanso and Recôncavo, as well as fields like Frade and Baúna ([EPE](#)).

⁷ 14 recently sold shallow fields have had their new development plans approved by ANP. These fields produced 81 thousand b/d in 2012, and only 26 thousand b/d in 2019. According to these plans, the fields will receive R\$ 10 billion in additional investments. ([ANP](#); [ANP](#))

The Federal Government's forecast, produced by EPE, indicates a significant increase in future oil production, to 5.3 million b/d in 2030. This volume is significantly higher than the 2.8 million b/d average in 2019. Natural gas is also forecast to increase from 122 million m³/d to 276 million m³/d ([EPE](#)). EPE forecasts are based on assumptions that the best-known assets are being developed by Petrobras or other international oil companies (IOCs), and exploration is reaching new record highs. Meanwhile, midsize assets are being sold to smaller companies, who usually manage to extract more oil and gas volumes from these oil fields. In this scenario Brazil's production is expected to continue to grow, especially due to giant Búzios and Mero fields.

Mid- and Downstream

The pandemic has affected demand particularly hard in 2020. Notwithstanding, the global and domestic economic recoveries have put the Brazilian O&G sector back on track. Petrobras remains in control of a leading share of the supply chain for natural gas and oil products. But the company has been withdrawing from a few segments, and recent events indicate that the transition towards a more competitive and open mid- and downstream segment is well underway. Petrobras' divestments have suffered several legal challenges, but rulings have been in favor of the state-owned entity.

During the second half of 2020, the Brazilian economy showed signs of recovery⁸, despite the lingering effects of the Covid-19 pandemic ([IBGE](#)). This growth was led by government emergency aid to citizens in socially vulnerable situation, which had a positive effect on the population's consumption rates, contributing to an increase in commercial and industrial activities ([IBGE](#)). However, the beginning of 2021 was marked by a Covid-19 resurgence, especially in March and April. This led to the saturation of Intensive Care Units (ICU) and hospitals, contributing to the high number of daily deaths, which prompted the adoption of new social distancing measures, impacting the economy and the demand for fuels ([EPE](#)). Since then, the situation has gotten a lot better, especially due to the vaccination campaign that started in the beginning of 2021. By June 2021, 34.5% of Brazilian citizens had received the first dose of the vaccine and 12.3% had been fully vaccinated ([Brasil](#)).

The Brazilian refining sector is amidst a transformation. The refining park has a daily oil processing capacity of 2.3 million barrels per day (b/d), 98% of which is owned by Petrobras ([ANP](#)). But the company is in the course of a divestment program set to sell a total capacity of 1.1 million b/d, as can be seen in Figure 3. According to a Commitment for Termination Practice (TCC – *Termo de Compromisso de Cessação de Prática*) signed between the company and the Brazilian antitrust regulator, CADE⁹ ([EPE](#)), these divestments were originally set to be completed by mid-2021, but this date has been postponed to the end of 2021 due to the pandemic ([Petrobras](#)).

⁸. After two consecutive falls of 2.2% and 9.2% in 1Q20 and 2Q20, the economy rebounded 7.7% in 3Q20 ([IBGE](#)).

⁹ CNPE Resolution nº 9/2019 established guidelines for the promotion of free competition in the country's refining activity, with the objective of stimulating the entry of new players and attracting investments to the sector, guaranteeing supply, and avoiding the creation of production, transport and distribution monopolies. The antitrust regulator understood that there was a high concentration in the refining segment, and demands that Petrobras completes the sale of all assets by the end of 2021 and sells each asset separately and in order to guarantee market competition after the sale. The regulator has also restricted buyers from acquiring several pairs of refineries because they are located in the same region, which would constrain competition.



Figure 3 – Refineries in the divestment process

Source: EPE

Legal challenges and the pandemic hampered the sale of these refineries. In July 2020, a group of Congressmen asked the Supreme Court (STF) to impede this deal ([STF](#)). However, this request was denied by STF in October, allowing Petrobras to proceed with the transactions ([Petrobras](#)). Throughout the end of 2020, Petrobras received offers for several of its refineries. Mubadala Group made the best offer to buy Landulpho Alves Refinery (RLAM) in the State of Bahia ([Petrobras](#)). Petrobras' council authorized the operation even though the price tag of US\$ 1.65 billion was below its initial estimates¹⁰. This led new organizations to protest the divestment. Brazil's Federal Court of Accounts (TCU) denied a request for the suspension of the business ([TCU](#)), and CADE also approved the sale ([CADE](#); [Petrobras](#)). Mubadala Group should start operating the refinery within 18 months ([Valor](#)), and this renewed the interest by other potential buyers ([Valor](#)). Notwithstanding these challenges, the Brazilian Government expects the refining market to become more competitive with new economic players. These divestments are

¹⁰ Since the end of June, Reman refinery's sale has also been signed between Petrobras and Ream participações ([Petrobras](#)). However, interested parties formally declined to submit proposals for the purchase of RNEST ([Petrobras](#)). Nonetheless, there are still interested parties discussing terms for the purchase of the other refineries([Petrobras](#)).

not only mandated, but are also in line with the company's strategic plan. Petrobras wants to focus on its more profitable endeavors, especially its deep and ultradeep exploration and production (E&P) assets. Therefore, it is selling stakes in most of its other activities, such as petrochemical, fuel distribution, biofuel production, fertilizer production, electricity generation, among others, as can be seen in Figure 4 ([EPE](#)) ([Petrobras](#)).

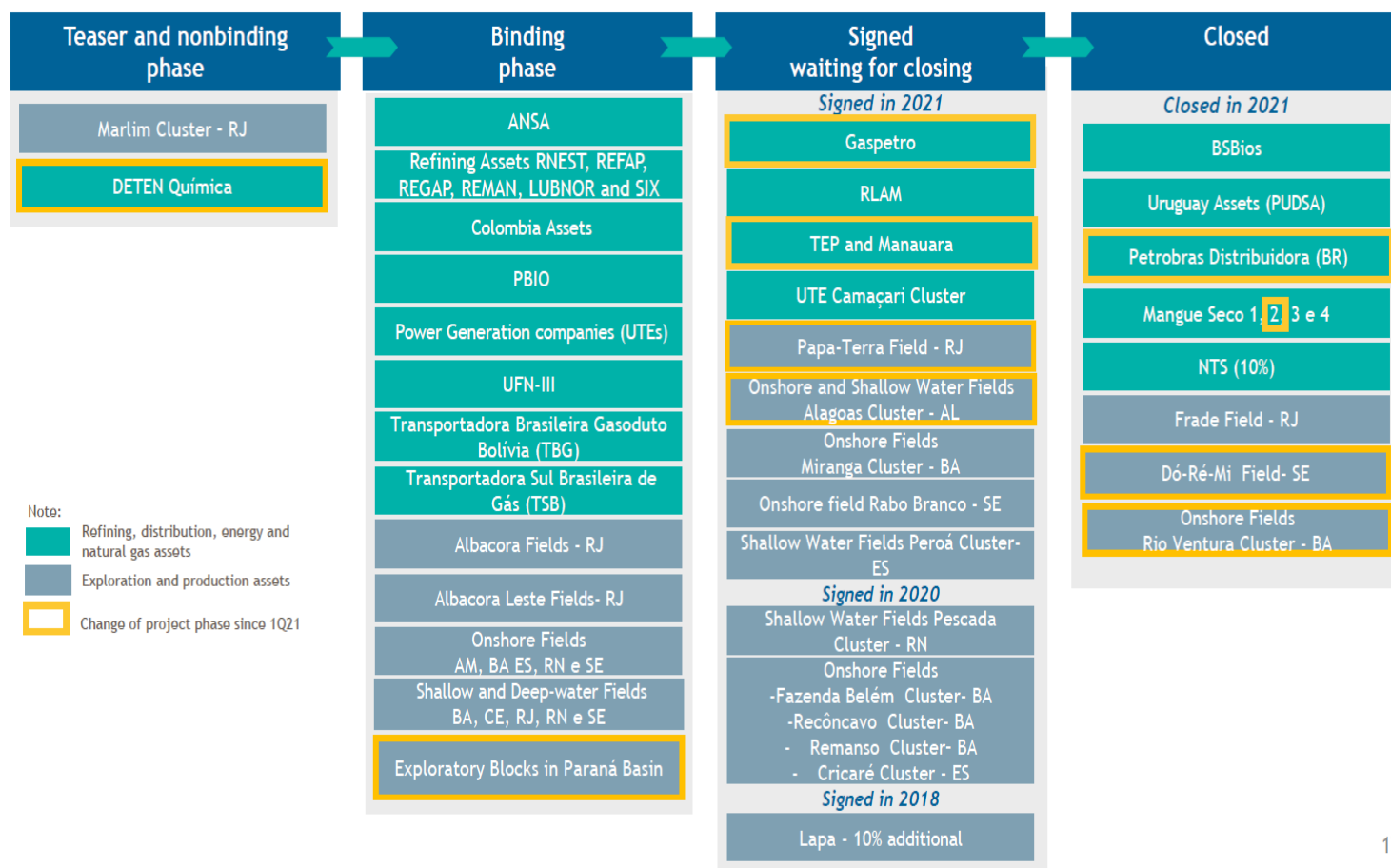


Figure 4 – Evolution of Petrobras divestment projects

Source: Adapted from [Petrobras](#)

Petrobras is still investing in its refining sector though. From 2021-2025 US\$ 4 billion will be spent focused on increasing operational and energy efficiencies, reducing emissions and production of high quality fuels ([Petrobras](#)). The slate of products has been changing considerably in Brazil, in particular because Heavy Duty Trucks, sold after 2012, can only operate with low-Sulphur fuel ([EPE](#)), with refineries churning out more low Sulphur diesel and fuel oil than ever before, with continuous production records being achieved in the first half of 2021 ([Petrobras](#)). This has led to an increasing low-Sulphur demand, that has been forcing Petrobras to invest in its refining park. The company announced it is going to build another three hydrotreating units (HDT) by 2025 to

increase its low-Sulphur diesel output ([Petrobras](#)). In addition, the company announced that it was implementing a Digital Transformation¹¹ program and efficiency program (RefTOP) in all its remaining refineries ([Petrobras](#)). The RefTOP program intends to invest up to US\$ 300 million until 2025 to increase efficiency ([Petrobras](#)).

Brazil's biofuels have been steadily growing, as can be seen in Figure 5.

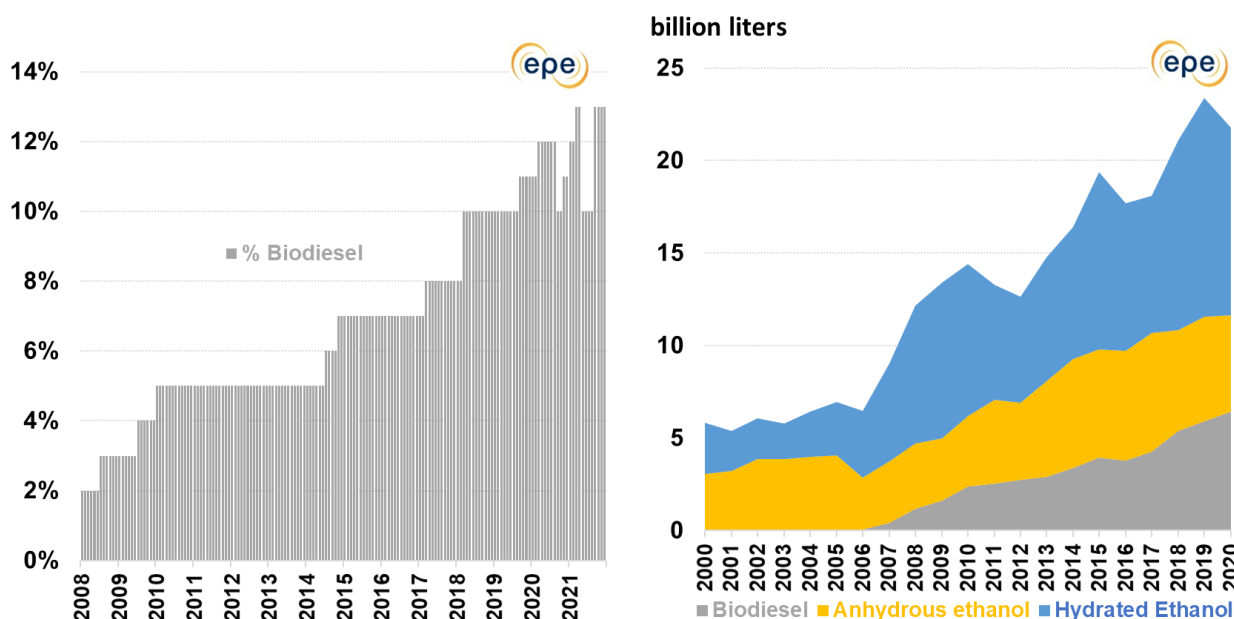


Figure 5 – Mandatory biodiesel addition and total biofuel consumption

Source: Adapted from [ANP](#) and [ANP](#)

One of the reasons for this growth is the increase in the mandatory biodiesel addition, that was elevated to 13% in March 2021 ([ANP](#)). Biofuel use has also been continually incentivized by the carbon prices (CBIO), implemented by the RenovaBio law, instituted in 2017 ([ANP](#); [MME](#)), that started being charged on the sale of fossil fuels from 2020. However, the pandemic and the ensuing crisis has also hit this sector hard, especially due to the increase in several *commodity prices* and the devaluated local currency. Rising sugar prices have changed the fuel mix in Brazilian sugar plants, in detriment of ethanol production ([EPE](#)). There were also some problems for ethanol producers to qualify for the RenovaBio program, which led CNPE to reduce the mandatory acquisition of CBIOs by distributors by 50% in 2020 ([CNPE](#)). These issues have been overcome, and the 2021 targets are back to the level originally envisaged ([ANP](#)). Record soy

¹¹ Petrobras is implementing the Digital Twins program in its refineries. It is a rigorous and integrated digital representation of every refinery process. This helps the operator to achieve ideal operating conditions, optimizing output and profitability. Other digital tools are the Data Lake, a data specialist tool, the Trip Detector, that predicts outages, the Smart Alarm, that helps with real-time decision-making.

prices ([EIA](#)) have also increased biodiesel prices considerably. Soy is the main input used for biodiesel production in Brazil. Biodiesel prices increased up to 80%, forcing the government to reduce the mandatory biodiesel addition to 10% for six months over the last two semesters ([ANP](#); [ANP](#); [MME](#)).

Despite these setbacks, Brazil has been increasingly betting on advanced fuels and biofuels to help decarbonize its economy. This is in line with Brazil's new climate targets announced in April ([EBC](#)). The Government also launched the Future Fuel Program (*Combustível do Futuro*). The main objective of the program is to foment the use of alternative energy sources and to strengthen the national technological development. This is supposed to be achieved by promoting sustainable fuels, such as 2nd generation ethanol and ethanol fuel cells, biomethane, LNG, paraffinic and FAME biodiesel, but also synthetic fuels ([MME](#)) ([MME](#)) ([MME](#)). The country is also discussing the directives to create a National Hydrogen Program. Among the objectives is to incentivize its production and use (in sectors such as transport and steel mills), but also to develop distribution infrastructure, research and development (R&D) and legal and regulatory framework ([MME](#)) ([MME](#)).

These public policies have been incentivizing the market to invest in low carbon fuel technologies, such as biofuels and natural gas. In this scenario, even Petrobras, that has continually stated that its main objective is and will continue being an energy company with a focus on oil and gas ([Petrobras](#)), has started investing in cleaner technologies. The state-owned company created a new climate change department in its structure, to help direct its actions towards carbon reduction and energy efficiency ([Petrobras](#)). The company has also launched its Biorefining 2030 Program, which envisages production of renewable diesel and sustainable aviation fuel (SAF) in its refineries by 2030 ([Petrobras](#)). In July 2020, tests were performed in Repar refinery to produce diesel with a 5% renewable content directly in the refinery ([Petrobras](#)).

Renewable or paraffinic diesel has only recently been regulated by ANP. It is not considered to be biodiesel, and therefore will not integrate the mandatory biodiesel addition into diesel ([IN](#)). But the Government wants to stimulate its production, since this is one of the objectives of the Future Fuel Program.

As beforementioned, natural gas is an important component in Petrobras' and the Government's plans. The natural gas industry is also in the midst of a structural transformation but has come much further over last two semesters. During the second half of 2020, important advances have been made in the legal framework for the transport of natural gas, as well as in the midstream segment, such as flow and processing activities and LNG regasification ([Senado](#)). After the promulgation of the New Gas Law (Law No. 14,134 of April 8th, 2021), Decree No. 10,712 of June 2nd, 2021 detailed the established guidelines ([DOU](#)) ([DOU](#)). The Decree reinforces compliance with legal and infra-legal instruments in relation to promoting competition and liquidity in the natural gas market; the promotion of free enterprise to explore competitive activities; the expansion, on an economic basis, of the transport system and other infrastructures; promoting efficiency and non-discriminatory access to infrastructure; and the harmonization between federal and state regulations relating to the natural gas industry.

The natural gas market's opening included the Alvo Petro's entry, a new natural gas producer in the State of Bahia, which began selling gas to Bahiagás (the local distribution company) in July 2020. It is the first private agent to own 100% of a natural gas processing plant in Brazil ([Abegás](#)). Several agents are preparing to start their operations in the Brazilian natural gas market. From July 2020 to June 2021, some companies obtained authorizations to become traders, shippers and importers of natural gas in the national competences' sphere¹². Regarding import authorizations, until the New Gas Law's publication, MME had authorized natural gas volumes for some companies (Shell Energy, Âmbor Energia, Trafigura do Brasil Importação Exportação e Comércio Ltda and Blueshift) ([MME](#)). ANP became responsible for this activity in April 2021, and issued new import authorizations on behalf of Âmbor Energia Ltda and Petróleo Brasileiro S.A. ([ANP](#)) ([ANP](#)) ([ANP](#)). Until March 2021, 73 agents were authorized to carry out the natural gas shipping activity, and 6 carried out natural gas shipping operations ([CMGN](#)).

¹² In 2020, Ecopetrol, Eagle E&P, Esfera Comercializadora de Energia Ltda, SPE 3R Petroleum S.A. and EBRASIL LNG Comercializadora Ltda were authorized as trading companies. In addition to the companies UEG Araucária, Companhia Brasileira de Estireno (CBE) and three subsidiaries of the Gerdau Group (Açominas, Aços longos and Aços especiais) obtained authorizations to import natural gas ([ANP](#)). Among the agents who received authorization to sell in the first semester of 2021, the Centrais Elétricas de Sergipe S.A (CELSE), SPE Rio Ventura S.A. and Âmbor Comercializadora de Gás Ltda ([ANP](#)) ([ANP](#)) ([ANP](#)) can be mentioned. In the case of natural gas loading, Gas Bridge, Brookfield Gestão e Energia S.A., among others received authorizations in 2021 ([Abegás](#)) ([ANP](#)).

Brazil's regulator (ANP) has been delineating the new regulatory framework in order to encourage new entrants. ANP organized three workshops on the conceptual model for the New Gas Market in the first half of 2021, dealing with contracting and commercialization aspects in the natural gas sector. While the first workshop dealt with the overall themes, the second event focused on the rules for balancing and coordinating between carriers, and the third dealt with marketing and different types of contractual arrangements ([ANP](#)). The Guidebook on Good Regulatory Practices for the Natural Gas Market, published in April 2021, presents general regulatory guidelines, with optional adoption, aiming to support the decisions of state regulators regarding the natural gas distribution activities ([ANP](#)) ([MME](#)).

With regard to third-party access to essential facilities, in September 2020 Petrobras laid out how this access was going to be granted for its pre-salt natural gas outflow and processing facilities. In October, Petrobras and its partners announced the possibility to create a new midstream company to manage the corresponding infrastructures, as well as their third-party access contracts. In this sense, an Integrated Natural Gas Flow System (SIE) and an Integrated Natural Gas Processing System (SIP) could be set up for better asset management ([Petrobras](#)) ([Abegás](#)). In August 2020, Petrobras reported that a third pipeline connecting the Santos Basin to the coast in Itaboraí/RJ (Rota 3) was entering the final stages of works. In November 2020, the company informed that the natural gas processing plant's pilot flame and the future lubricant production hub in Itaboraí/RJ (Polo Gas Lub) have begun to undergo testing operations ([Petrobras](#)).

An important element that will contribute to the market becoming more competitive is reducing Petrobras' market share. There has been a lot of progress in this front. In compliance with the TCC signed with CADE, Petrobras informed about the beginning of the non-binding phase for the sale of its 51% stake in Transportadora Brasileira Gasoduto Bolivia-Brasil SA (TBG) and 25% in Transportadora Sulbrasileira de Gás SA (TSB) ([CADE](#); [Petrobras](#)). The sale of Petrobras' remaining 10% stake in Nova Transportadora do Sudeste S.A. (NTS) to Nova Infraestrutura Gasodutos Participações S.A. (NISA) was concluded ([Petrobras](#)). The sale of Petrobras' remaining 10% stake in the TAG transmission company was completed in 2020, in accordance with the TCC. TBG also reported on the progress of the public call process (CP02/2020) for contracting capacity in its Transport System ([TBG](#)).

Concerning the new contracts for importing natural gas via gas pipelines, the Brazilian and Argentinian governments had meetings in 2020 to discuss the new pipeline project to bring natural gas from Vaca Muerta's fields to State of Porto Alegre ([Abegás](#)). It was also announced the adhesion of the transport company GasOcidente do Mato Grosso (GOM), owner of the Lateral-Cuiabá gas pipeline, to the Association of Natural Gas Transport Companies by Gas Pipelines (ATGás). Subsequently, negotiations were announced between Yacimientos Petrolíferos Fiscales Bolivianos (YPFB) and MTGás to supply Bolivian natural gas to Mato Grosso, possibly using the GOM transport system ([Abegás](#)) ([Abegás](#)).

Regarding the Brazilian LNG industry development, in the last two semesters new LNG terminals were announced, which will be able to diversify the participation of agents in the national natural gas market ([EPE](#)). In this period, expansion of existing facilities was also announced. Figure 6 shows the locations of the existing and future LNG terminals in Brazil¹³.

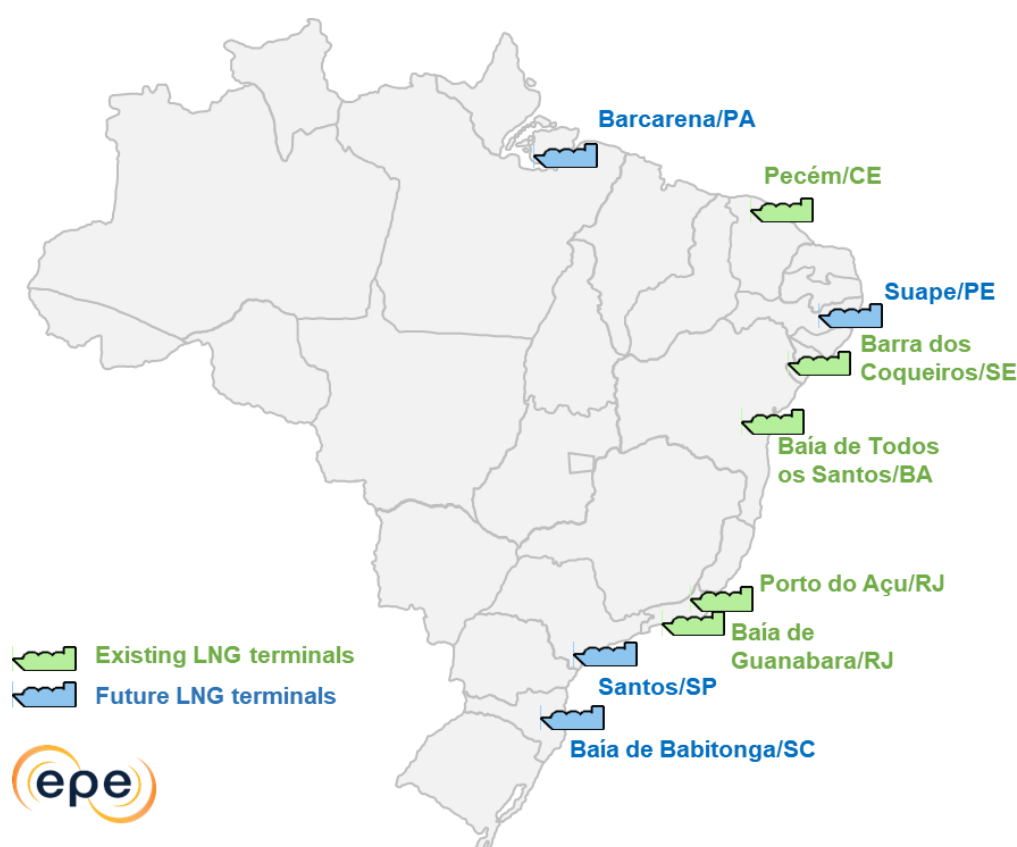


Figure 6 – Existing and Future LNG terminals in Brazil

Source: [EPE](#)

¹³ The Indicative Plan for LNG Terminals (PITER) was published by EPE in July 2021 and it describes the main technical features and estimates costs of new LNG terminals alternatives in Brazil ([EPE](#)).

Brazil has two private LNG terminals – Port of Açu/RJ and Barra dos Coqueiros/SE – and state-owned Petrobras holds three terminals – Guanabara Bay/RJ, Todos os Santos Bay/BA and Pecém/CE. Petrobras successfully completed the tests to expand the instantaneous regasification capacity of the Guanabara Bay/RJ LNG terminal from 20 to 30 MMm³/d, making it the largest terminal with this configuration in the world. The auction to lease the LNG terminal at Baía de Todos os Santos/BA is underway ([Petrobras](#)).

Thus far, LNG imports had been dominated by Petrobras. This has been changing though. The company New Fortress Energy (NFE), for instance, obtained authorization to import up to 37.5 million m³ of LNG through the Regasification terminal in Salvador/BA ([MME](#)).

In December 2020, the company Gás Natural Açu (GNA) completed the first LNG transfer operation in the newly built terminal at Port of Açu/RJ ¹⁴, and obtained an operating license for thermoelectric power plant GNA I, which will integrate the Thermoelectric cluster in the port ([GNA](#)) ([GNA](#)). The terminal announced at the Port of Santos/SP advanced, obtaining a declaration of public utility ([Abegás](#)). In the first half of 2021, an Environmental Installation License was issued with the Environmental Institute of Santa Catarina, enabling the NFE to implement the South Gas Terminal - TGS ([Governo de SC](#)). NFE also confirmed the final investment decision (FID) for the LNG terminals in Suape/PE and Barcarena/PA, both scheduled to operate in the first quarter of 2022 ([EPBR](#)). The Compass company estimated that the LNG terminal at the Port of Santos/SP will also be completed by 2022 ([Compass](#)).

It is worth mentioning that three other terminal projects (not shown in Figure 6) are planned in the coming years and may promote a greater supply of natural gas with different parameters of flexibility in diversified points of the gas pipeline network, also enabling the transshipment of liquid LNG to isocontainers in order to supply to new customers through virtual pipelines.

In the case of small-scale LNG, NFE contracted the supply of two liquefaction stations (in Bahia and São Paulo), and Petrobras sold its stake in the company Gás Local, which has a natural gas liquefaction unit in São Paulo for production and distribution of LNG by trucks ([World Oil](#)) ([Petrobras](#)). The growth of this market in Brazil may promote the supply of natural gas to regions that are not yet supplied with natural gas.

¹⁴ At the LNG terminal at Port of Açu/RJ, GNA received around 66,000 tons of LNG that were used for commissioning the terminal of the natural gas thermoelectric plant GNA I, and a few months later the terminal obtained authorization for definitive operation ([Abegás](#)) ([Abegás](#)) ([ANP](#)).

Natural gas prices for distributors declined throughout 2020, and Brazilian local distribution companies' (LDC) natural gas tariffs followed that direction. In 2021, however, there was a recovery in prices due to the indexation of contracts that remain indexed to Brent. In May 2021, several LDCs reported on passthroughs to customers of the 39% increase in the price of the natural gas molecule sold by Petrobras, due to the contractual adjustment. Although it is expected that the price corrections will be made in full, the LDCs informed that measures could be adopted aiming at the deferral, installment and/or amortization of the price increase ([Abegás](#)) ([Abegás](#)) ([Abegás](#)) ([Abegás](#)). In Figure 7 average prices of natural gas to industrial consumers are shown from January/2020 to April/2021.

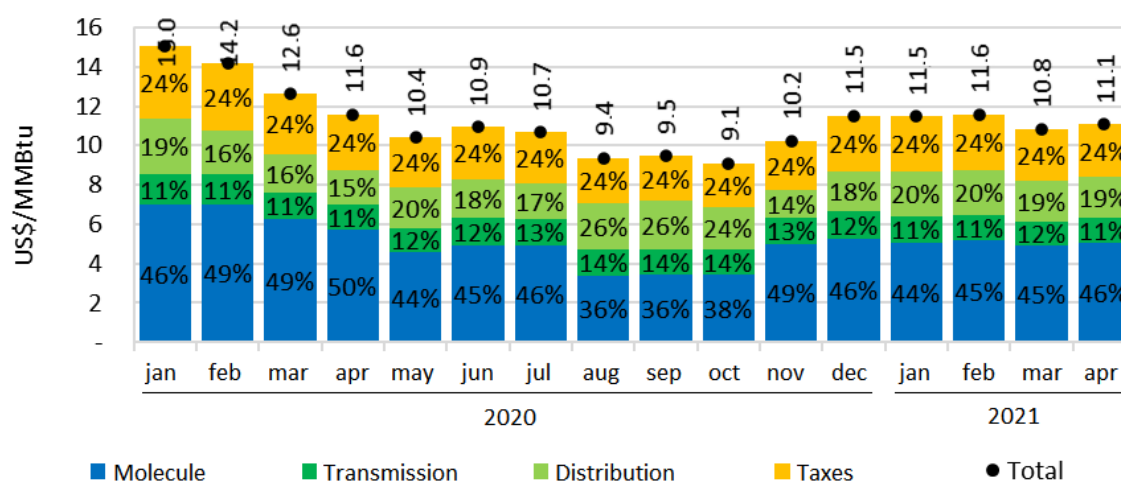


Figure 7– Average prices of natural gas to industrial consumers of 20.000 m³/d

Source: Adapted from [MME](#)

Due to the prospect of price increases, Petrobras approved new models of natural gas contracts, considering indexing to Henry Hub instead of Brent, and promoting greater price stability with an improvement in the competitiveness of gas compared to oil and liquid fuels. The choice might be made voluntarily by the customer, and pricing formulas will be announced after commercial negotiations ([Petrobras](#)). In October 2020, Petrobras confirmed with the states of Espírito Santo and Rio de Janeiro its adherence to the ICMS tax program, which should increase legal security in the natural gas and oil product markets in these states due to the confirmation of future rules for tax assessment ([Petrobras](#)).

The distribution market presented news about the sale process of Petrobras' stake in Gaspetro, which had its binding phase started in July 2020, and is currently in progress after disqualification

and subsequent readmission of the Compass company within the process¹⁵ ([Petrobras](#)). The LDCs in the South and Midwest regions made public calls for the purchase of natural gas until 2023, while the LDCs in the Northeast started a similar process, and Copergás defined Shell as the winner of the competition for the supply of natural gas to Pernambuco between 2022 and 2023 ([Abegás](#)) ([Abegás](#)) ([Abegás](#)) ([Abegás](#)) ([Abegás](#)). The public call to receive natural gas in 2021 made by natural gas distributors Copergás (PE), Algás (AL), Cegás (CE), Potigás (RN) and Sergas (SE) received 24 supply proposals from 9 participants ([Abegás](#)). The public call to receive natural gas in 2022 made by distributors Sulgás (RS), Compagas (PR), SCGÁS (SC), MSGÁS (MS) and GasBrasiliano (SP) received more than 130 proposals from 13 agents ([Abegás](#)) ([Abegás](#)). In addition, a concession contract between the Government of the state of Espírito Santo and the Espírito Santo Gas Company (ES Gás) was signed in July 2020, aligned with the New Gas Market program. In Rio de Janeiro, a resolution from the local regulator AGENERSA was approved, which reinforces the alignment of the state-level regulation to the New Gas Market ([Abegás](#)) ([Abegás](#)).

The renewable gas market had important advances with a public call made by Sulgás for the supply of biomethane in Rio Grande do Sul, and with the announcement of the partnership between GasBrasiliano and ZEG Biogás to build a biomethane gathering network that will promote injection into the distribution network. In October 2020, one of the largest biogas thermal power plants in the world was inaugurated in Guariba/SP, generating 138,000 MWh/year, which will be sold to the National Interconnected System (SIN) and to the unregulated market ([Casa Civil](#)).

From July to December 2020, projects that consume significant volumes of natural gas were inaugurated in Brazil. In August, the largest natural gas-fired thermoelectric plant in Latin America was inaugurated, in Barra dos Coqueiros/SE ([Abegás](#)). In September, Petrobras announced it would be selling its stake in five electric power generation companies operating in the states of Pernambuco, Tocantins, Amazonas and Goiás ([Petrobras](#)). In October, Petrobras started the binding phase for the sale of Araucária Nitrogenados S.A., a fertilizer production unit located in Paraná, and in November Sergas announced that it will start servicing the Nitrogenated Fertilizer Plant (*Fábrica de Fertilizantes Nitrogenados – Fafen*) in Laranjeiras/SE, recently leased to the Proquigel ([Petrobras](#)) ([Abegás](#)).

¹⁵ Petrobras subsequently informed that the contract with Compass has been signed and the transaction is currently depending on definitions regarding the right of preference clause and approval by Cade ([Petrobras](#)).

MME published ordinances on the A-3, A-4, A-5 and A-6 Electric Power Auction scheduled for 2021, 2022 and 2023, four of which (A-5 and A-6) without inflexibility restrictions for operation ([MME](#)). This will likely result in new generating capacity over the next several years. Much of this is expected to be gas-powered. Wärtsilä and the Amazonas Power Plant – Gera signed a contract to convert the Ponta Negra/AM power plant from diesel oil to natural gas. Fuel switching has already been done in other oil-fired thermoelectric plants and may become a trend in the coming years, contributing to the expansion of the natural gas market and reduction of greenhouse gas emissions in the electrical sector.

Brazil is experiencing the greatest water scarcity in the last 91 years, which affects its hydroelectric plants ([MME](#)) ([MME](#)) ([ANEEL](#)). The low levels of hydroelectric reservoirs impose restrictions on power generation, encouraging the LNG import for thermoelectric use ([Reuters](#)) ([Platts](#)) ([Argus](#)). In June, there was a record in the instantaneous LNG volume regasified in the country, with 42 million m³/d only at Petrobras facilities ([Petrobras](#)) ([Platts](#)).

The Covid-19 pandemic brought new challenges, with significant effects on consumption, services and industrial activity in Brazil, directly impacting the oil and natural gas sector¹⁶. The economy started recovering significantly in the end of 2020 and beginning of 2021. Industrial production recovered to its pre-pandemic levels in September 2020 ([IBGE](#)). White good appliances sales not only reached a pre-pandemic level in the third quarter of 2020, but reached their highest value since the 2014 economic crisis erupted ([IBGE](#)). These sales were driven by behavioral and spending changes brought about by the pandemic, and the ensuing social distancing and tele-working. But were also sparked by the Federal Government's Emergency Relief Program. The program started giving out cash payments to underprivileged people in April 2020. The benefits are programmed to continue until the end of August 2021 ([MCidades](#)). Originally families received about US\$ 16 (R\$ 600¹⁷) per month. But this value was subsequently reduced to between US\$ 29 and US\$ 73 (R\$ 150 and R\$ 375) per family ([Senado](#)). For comparison purposes, the basic monthly consumption basket costs from US\$ 87 to US\$ 106 (R\$ 450 to R\$ 650) depending on the region, and the minimum wage is US\$ 213 (R\$ 1,100) ([DIEESE](#)).

¹⁶ The effects of the pandemic were seen on the country's economy from the end of the first quarter last year. Domestic economic activity reached its lowest level in April 2020, with partial recovery in May and June ([EPE](#)).

¹⁷ Prices were converted using the average currency exchange from 2020, of R\$ 5.16/US\$.

The Relief Program partially compensated an increasing unemployment rate that reached 14.7% in the first quarter of 2021, biggest value since 2012 ([IBGE](#)). And partially explains why retail sales grew considerably in 2021. Brazil's GDP grew 1.2% in 1Q21 and returned to the pre-pandemic level. The expansion came from the positive results in agriculture (+5,2% vs 1Q20) and industry (+3.0% vs 1Q20). Services, household and government consumption have recovered, but have not reached pre-pandemic levels yet.

As aforementioned, Brazil's recovery wasn't gradual, but rather rocky. This is reflected in fuel sales throughout the last year. Especially jet, diesel, hydrated ethanol and gasoline grew considerably in the second half of 2020. Jet and gasoline were particularly hard hit by the new lockdowns, but recovered significantly in May. Otto Cycle demand (gasoline and ethanol) grew, reaching a consumption level in December 2020 only 0.8% below the same month in 2019. In April 2021 this consumption was 15% below the same month in 2019, but this already recovered to 8.7% below in May, and is expected to have recuperated even more in June.

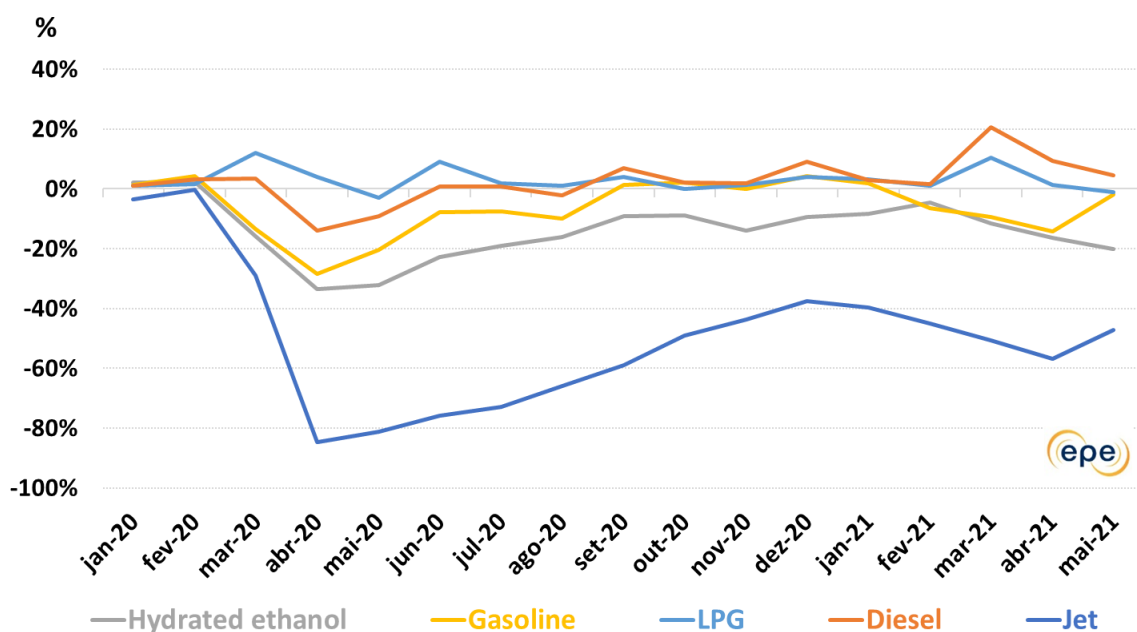


Figure 8 – Change in domestic sales oil product relative to the same month in 2019

Source: Adapted from [ANP](#)

Hydrated ethanol, which in Brazil directly competes with gasoline since most of the automobile fleet is flex-fuel, suffered an even worse blow. Some sugarcane mills have flexibility in their output, choosing to produce more ethanol or sugar. Many producers decided to make sugar instead, which can be exported, and was interestingly priced due to the currency depreciation. Other ethanol producers that don't have that flexibility had to curtail their production. This caused a significant fall in ethanol supply. This situation seems to have permitted gasoline demand to avoid further losses ([EPE](#)).

Jet was the most impacted fuel by the pandemic. Demand had been recovering steadily, reaching 63% of its pre-pandemic levels. From February to April demand fell as flights were canceled due to the lockdowns, but these started being reversed in May. Liquefied Petroleum Gas (LPG), which is mainly used as a cooking fuel in Brazil, has increased due to the pandemic, and has been maintaining consumption levels above those registered before the pandemic ([EPE](#)).

Diesel demand was very resilient throughout most of the pandemic, and demand over the five first months in 2021 has been 8% above the consumption over the same period in 2019 ([ANP](#)). This can be explained by the fact that road transportation is responsible for most of the freight in Brazil. The recovery in consumption, the increase in online shopping, and record agribusiness exports, hauled around the country mainly by heavy duty trucks, drove distillate demand ([EPE](#)). Brazil reached new grain production records in 2020 and 2021 ([IBGE](#)), and the local currency's devaluation and record commodity prices led to the best historical performance in agricultural exports ([MAPA](#)), increasing diesel demand by agricultural machines and trucks.

This fluctuating demand has had significant impacts on refinery operations and on the foreign trade of oil and its products. This was compounded by the Brazilian oil production, that declined during the second half of 2020, but increased again during the first half of 2021. Refinery utilization rates surged to a recent record in the second half of 2020, especially due to the rapidly increasing demand, as shown in Figure 9. The production was focused on diesel, because of the considerable demand growth during the soybean harvest, leading to record diesel outputs. The latest spike in coronavirus cases forced refineries to reduce output. Since the diesel demand remained robust, diesel had to be imported. But refinery operations resumed quickly, as demand also recovered.

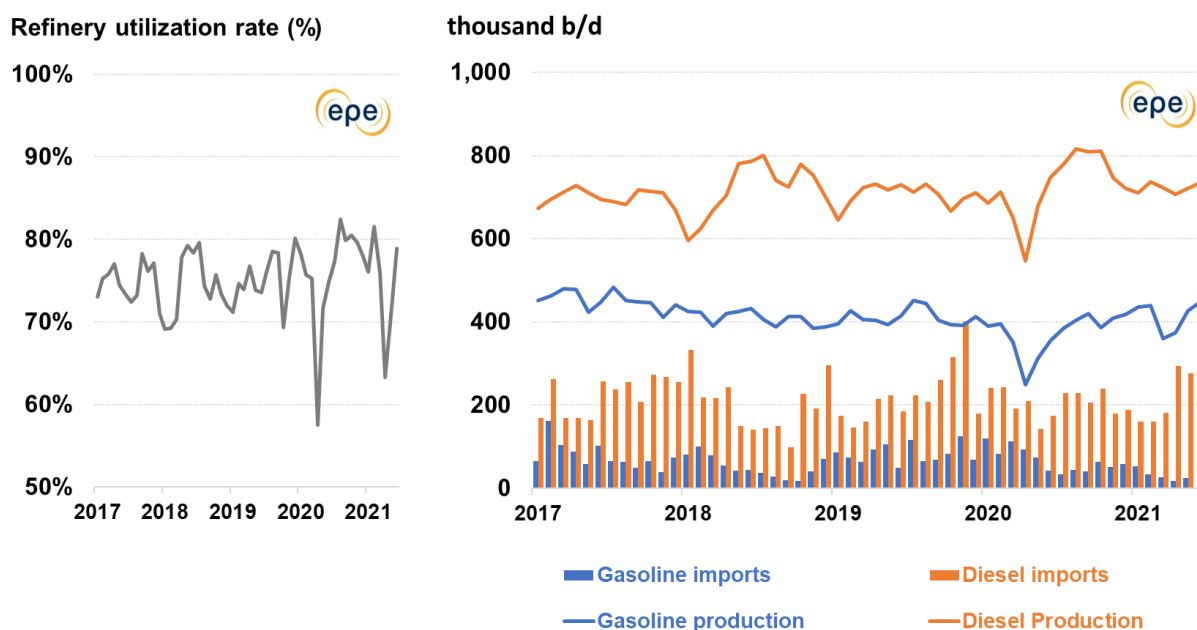


Figure 9 – Brazilian refinery utilization rate, and production and imports of gasoline and diesel

Source: Adapted from [ANP](#) and [ANP](#)

Refineries have also focused on producing low-Sulphur fuel oil. Figure 10 shows how fuel oil exports increased considerably since 2020, especially due to the impacts of new IMO Sulphur restrictions on marine fuels. Refinery utilization rates have also affected oil exports, partially explaining the declining exports in the beginning of 2021.

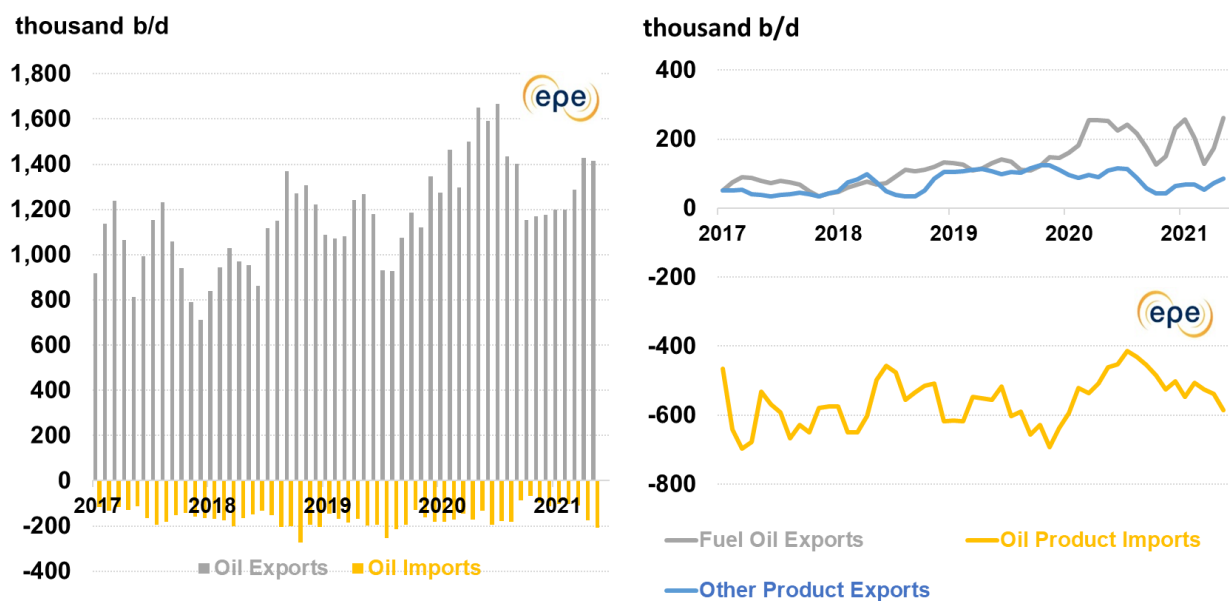


Figure 10 – Oil and oil product exports and imports (3-month moving average)

Source: Adapted from [ANP](#)

The local currency devalued significantly as the first coronavirus wave reduced the country's prospects. More recently, this has been reversing, as can be seen in Figure 11.



Figure 11 – Selected currencies in relation to the USD (base 100 in January 2019)

Source: Adapted from [Banco Central do Brasil](#)

This currency depreciation compounded international price increases, raising domestic fuel prices considerably, as can be seen in Figure 12. Petrobras, still the dominant fuel supplier in Brazil, readjusted local diesel prices six times within the first two months of 2021, increasing them by 26.3% ([Petrobras](#)). Local gasoline prices increased by 35.8% over the same period.

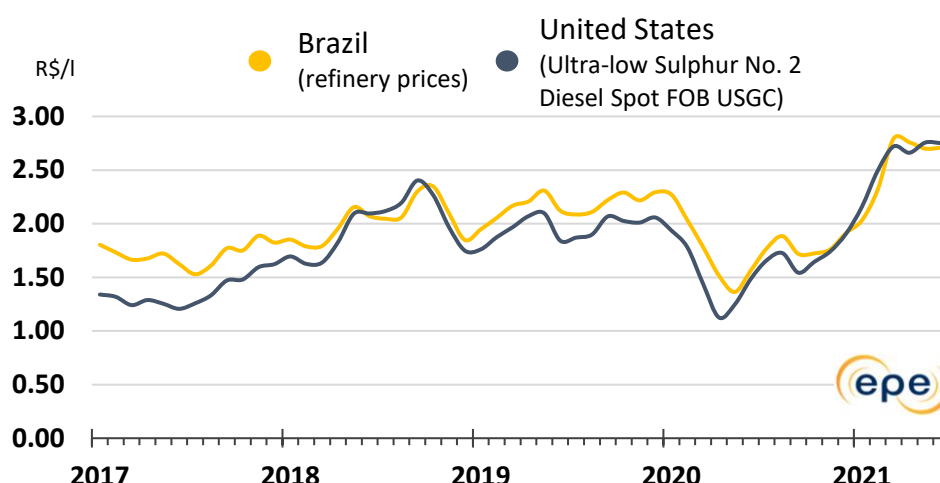


Figure 12 – Reference diesel prices in the Gulf of Mexico (USGC) and refinery prices in Brazil

Source: Adapted from [ANP](#), [EIA](#) and [Banco Central do Brasil](#)

Petrobras came under pressure to retract the fuel increases, particularly by truckers, that called for another general strike in the beginning of February ([CNTRC](#)). The Government reduced import tariffs on tires ([Brasil](#)), promised to study the reduction of federal taxes on fuel sales, and to reduce the bureaucracy of truckers¹⁸. The movement showed little adhesion, and was not as disruptive as the one in 2018.

In order to answer truckers claims, the Federal Government removed federal taxes from diesel sales in March and April ([MEcon](#)). Further, a currency appreciation allowed local diesel prices to remain constant, even though international oil prices were reaching multi-year records, allowing for a slight decrease in prices by the end of June ([Petrobras](#)). As promised, a new program to incentivize road freight was also instituted, called *Gigantes do Asfalto*. Among the measures are the creation of an electronic transport document (DT-e), and the flexibilization of the weight limits per axle ([MInfra](#)).

¹⁸ The Federal Government had already made concessions since the last strike in 2018 ([EPE](#)).

Notwithstanding, Petrobras reaffirmed its commitment to its pricing policy based on the international price parity ([Petrobras](#)). The Federal Government, as majority stakeholder in Petrobras, appointed a new president and board-member to the oil company ([Petrobras](#)). On being sworn in, the company's new president said it was necessary to reconcile the interests of consumers and shareholders, without disrespecting the international price parity, which appeased the market ([Petrobras](#)). Since then, the company has maintained its asset sale, and its previous pricing policy, increasing the company's stock price near all-time highs ([B3](#)). It also managed to raise US\$ 1.5 billion in international bonds in June paying a coupon of 5.50%, the lowest paid by the company in its history ([Petrobras](#); [Valor](#)).

Most investments by Petrobras are currently being focused on the upstream. However, private operators have been committing to investments in the mid- and downstream too. As previously stated, Petrobras has had success in selling several assets. These are likely to draw additional investments. Importers and other economic players have also been investing in infrastructure. Four oil product terminals were sold in the Port of Itaqui in Maranhão. Total investment is supposed to be over US\$ 116 million (R\$ 600 million), and will help supply Brazil's northeastern region ([MInfra](#)). Açú Petróleo also signed a contract with Petrobras to increase the volume of oil exported by the company in its private terminal in Port of Açú by 140%, to 300 thousand b/d ([Açu Petróleo](#)). Fuels are also being increasingly transported by rail, reducing freight costs and aiding the product interiorization ([MInfra](#)). Early renewals of older rail concessions and new concessions have been promoting investments in the sector, in exchange for investments in new rail, shipping and multimodal terminals and rail integration. This is likely to stimulate the economy, and lead to a better and balanced logistical network in Brazil ([ANTF](#)). And this is on top of all the investments in natural gas and LNG infrastructure that is being performed.

Final Remarks

Since the discovery of prolific pre-salt deposits offshore Brazil's southeastern region in 2006, the country has been hailed as the next big oil and gas producer. Over the past few years, changes in the market, in company strategies and in regulations have started to allow these expectations to materialize. Even the Covid-19 pandemic, that has hit the global upstream oil and gas industry, has not materially dimmed projects, investments decisions and forecasts for this industry in Brazil.

Domestic oil and gas production has not recovered previous peaks yet, as a reduction of investments in mature and less productive fields, and platform maintenance reduced overall production. However, these fields have or are being sold to private players that are starting to invest to revert recent production declines. When considering all new FPSOs that are already being developed, and the productivity and size of the fields that will start producing, Brazil's production is bound to reach successive records over the next few years. Concurrently, Petrobras and other majors are announcing record investments in pre-salt fields, even while investments in other countries are still lagging. Improvements in the bidding process, competitive assets, resilient projects, world-class resources and legal security allowed Brazil to consider new licensing rounds. EPE forecasts a considerable growth, with the country's production expected to reach 5.2 million b/d of oil and 1.6 million boe/d of natural gas in 2030.

The natural gas market is in the midst of a structural transformation, by undergoing an opening process that is attracting ever more competition, players and new investments. A new regulatory framework, introduced through the New Gas Law, allowed for more predictability. Combined with Petrobras' divestments, the sector is changing considerably. New companies started operating and diversifying its activities, which in turn favors the approval and development of new natural gas infrastructure projects. Third party access has also become more widespread, allowing more companies to use Petrobras' infrastructure, which in turn stimulates more supply, promoting more demand. Brazil's natural gas supply has been diversifying, with LNG imports becoming more relevant, and pre-salt pipelines allowing more natural gas to reach Brazil's shores. All of this is bound to increase the size of the natural gas market, and its efficiency.

The fuel sector is also a highlight. The sector was seriously impacted in the beginning of pandemic, and again in the beginning of 2021. However, this negative impact has been quickly reversed. The extreme volatility in demand was adequately handled by the local refining park and import infrastructure, that has become ever more diversified. The refining sector is also becoming less concentrated, with Petrobras completing the divestment of two out of eight refineries put on sale. These transactions should contribute to accelerate improvements in Brazilian refining, leading to more investments.

Expectations indicate a recovery in global economic activity in the coming years, as business operations normalize and travel restrictions ease. This should stimulate the local economy even more. Brazil's oil and gas industry growth prospects are very positive. Oil supply should continue to increase, driven by future and already committed investments, especially due to the prolific reserves and declining exploration costs. Oil product and natural gas demand should also continue growing, as per-capita income increases and more people become part of the middle class. This growth will guarantee demand for new downstream assets, which, in combination with Brazilian energy policies, improvements in legal and regulatory framework and promoting a more competitive and investor-friendly market should attract more investments and players.