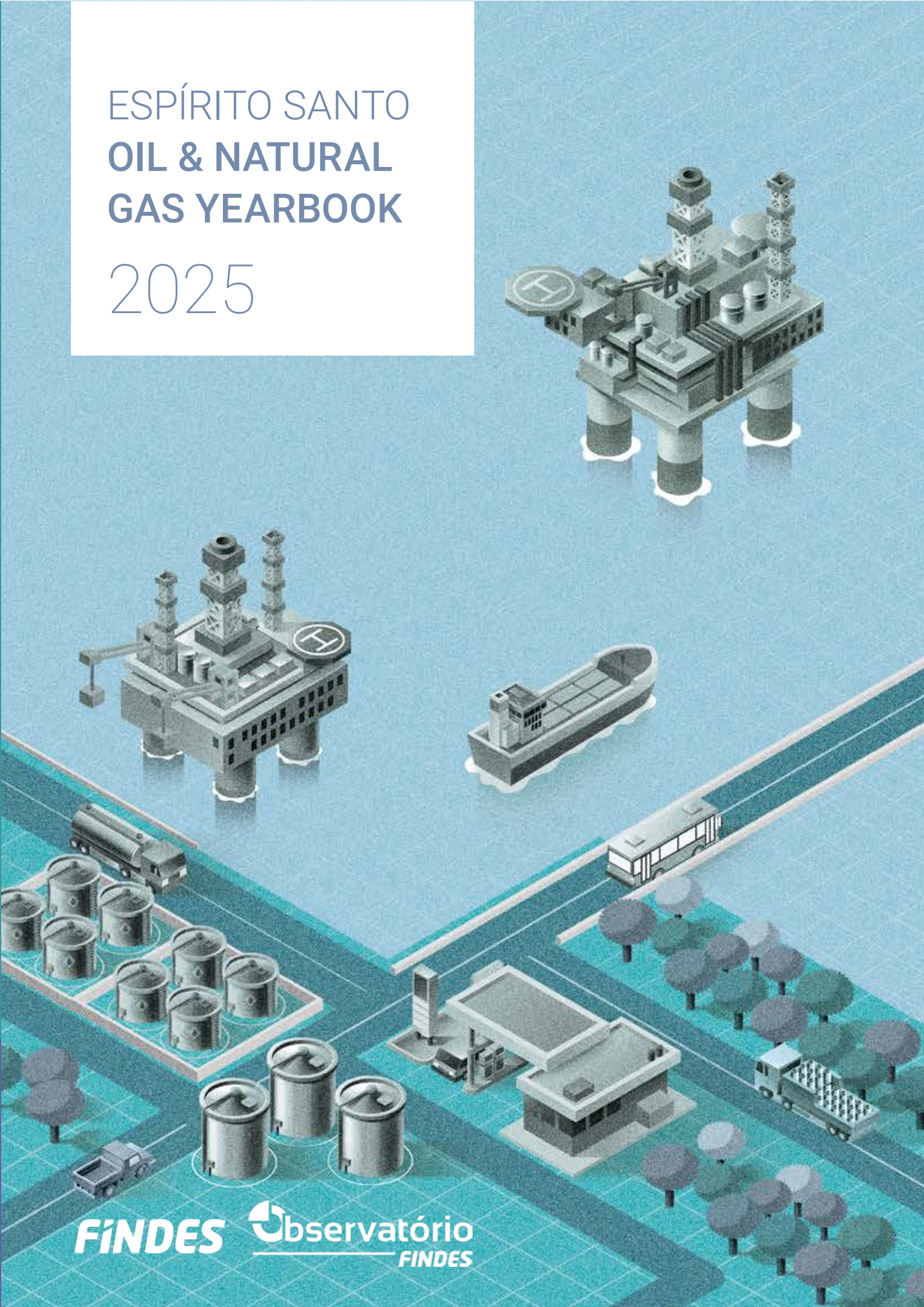
ESPÍRITO SANTO
OIL & NATURAL GAS YEARBOOK
2025



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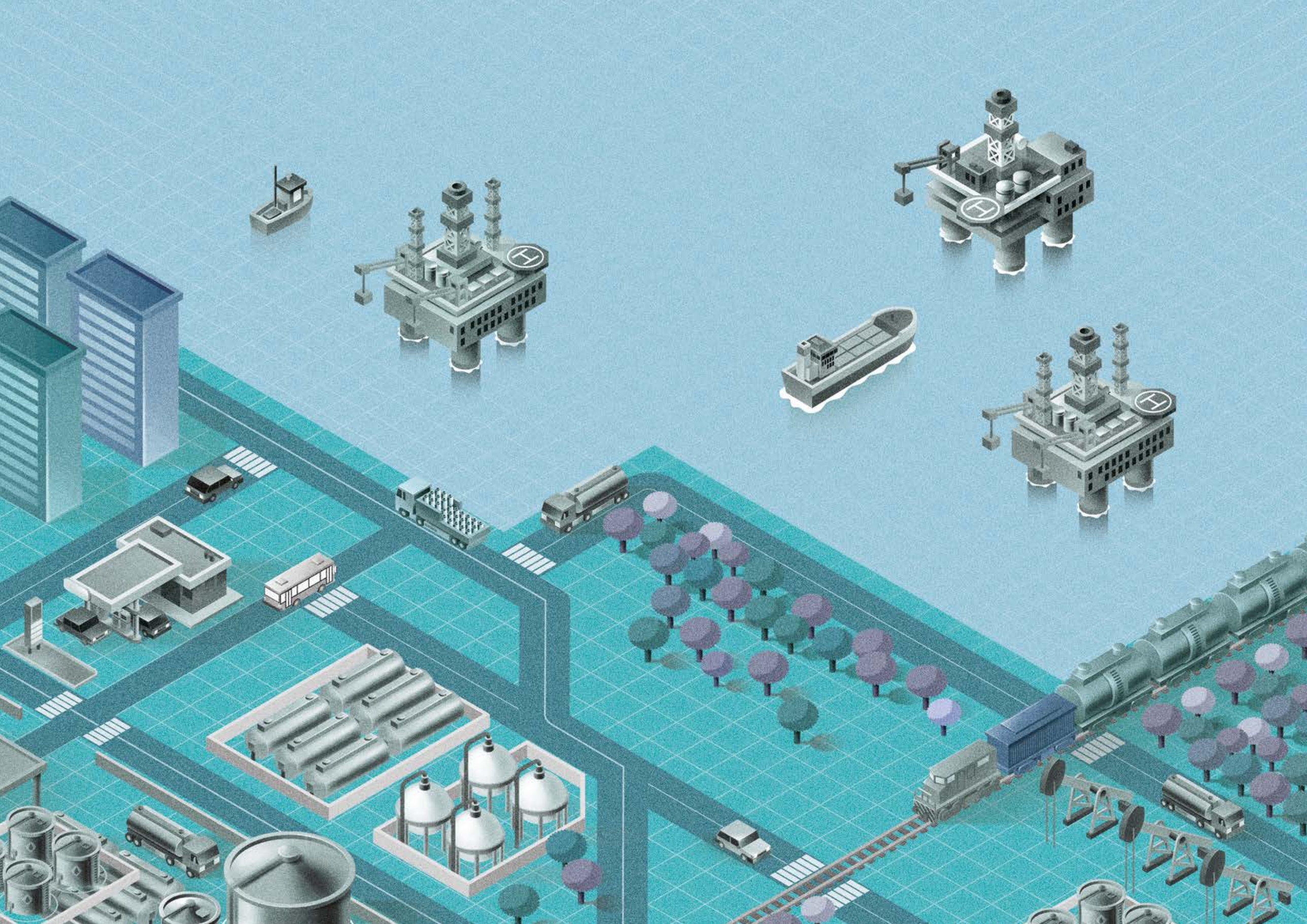

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SUPORT

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OPENING LETTER

Almost seven decades ago, the first exploration studies for oil and gas production in Espírito Santo began. Approximately 60 years ago, Espírito Santo witnessed the discovery of oil in the region of Nativo, in São Mateus. And, in 1969, the first well with commercial feasibility began producing, which represented the kickstart of the state's onshore production. Whereas the offshore activities began almost a decade later, in 1977, with the Cação Field, located in the seacoast of São Mateus. And, in 2008, the state took a productive leap, with the beginning of pre-salt production.

The 8th edition of the Espírito Santo Oil and Gas Yearbook, written and organized by Observatório Findes, brings an important reflection to the industry, both regionally and nationally. The document, published since 2017, will feature extremely relevant indicators and data about the sector, compiling information about reserves, exploration and the segment's production chain. In addition to displaying a portrait of the past, this material awards us with projections, prospects and scenarios for the next few years.

For 2025, perspectives are encouraging. Onshore, there will be a production increase derived from Integrated Project of Parque das Baleias; and the Wahoo and Golfinho fields. Onshore, the expectation is an increase coming from the latest oil discoveries in the last few years, in the northern region of Espírito Santo. Against this backdrop, the state's oil production must undergo a 11.2% increase per year between 2025 and 2027. Regarding natural gas, the expected increment is 10.4% per year.

Additionally, some important and very anticipated news are the confirmation of great investments in the state, which will benefit the sector's entire production chain. In total, investments of more than BRL 44.2 billion are announced until 2030. It is worth noting how the sector's production has developed and consolidated in the state. Currently, the sector has over 600 companies in Espírito Santo, which altogether employ at least 15 thousand formal workers, with a salary above the national average.

With constant dialog, qualified partnerships and information obtained by Findes through Observatório Findes and Espírito Santo's Forum of Oil, Gas and Energy of Espírito Santo (Fórum Capixaba de Petróleo, Gás e Energia), we have increasingly participated in debates and worked in strategic topics to strengthen the sector. For this reason, this edition of the Yearbook also brings analyses of the main actors in the country's oil and gas sector and their partners, such as the National Agency of Petroleum, Natural Gas and Biofuels (ANP), Petrobras and the Espírito Santo Development Bank (Bandes).

Enjoy your reading! I am sure the Yearbook will be your book of reference for Espírito Santo's oil and gas sector. More than just data, we are providing you with a view of the opportunities created for the sector in the state.

Paulo Baraona

President
of Findes

PRESENTATION

Marília Silva

Chief Economist at Findes

Executive Manager of Observatório Findes

After drilling the first exploration well in 1959, the oil and natural gas industry has developed continuously, consolidating its position as one of the pillars of Espírito Santo's economy. Marked by its high technological demand and the generation of formal and qualified jobs, this industry drives the state's economic, social and technological development, promoting production chains and benefitting several surrounding sectors.

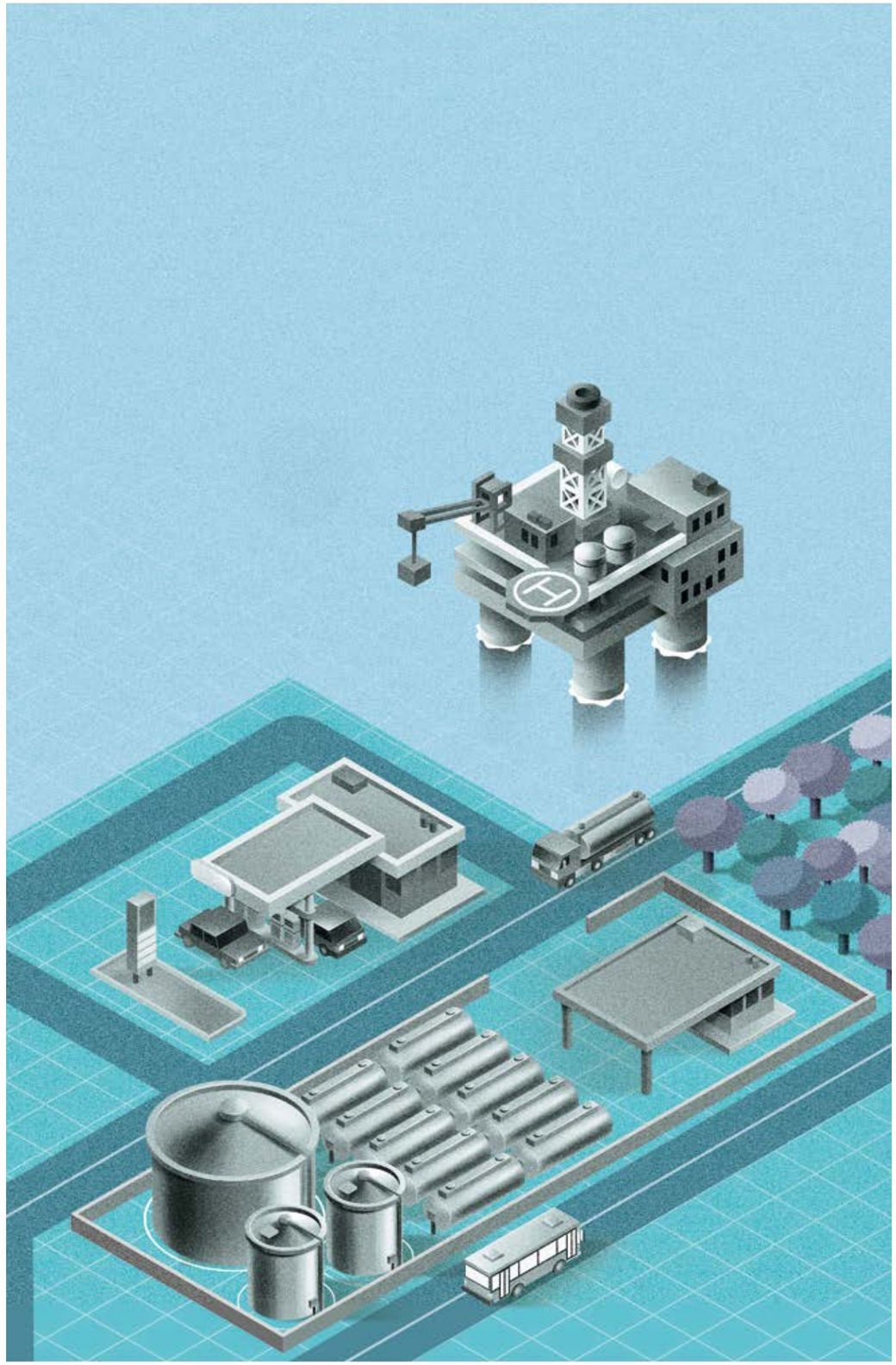
Espírito Santo is responsible for the third largest oil production and the fourth largest natural gas production among all federative units. As a result, this industry has generated, in total, BRL 2.6 billion in government take fees in the state. Additionally, oil and natural gas exploration involves a comprehensive chain of specialized goods and services, gathering 600 companies regionally and generating more than 15 thousand formal jobs, with an average salary of BRL 9.2 thousand.

Acknowledging the strategic importance of this industry, Observatório Findes remains dedicated, for the eighth consecutive year, to monitoring and analyzing the evolution of this industry with the Espírito Santo Oil and Natural Gas Yearbook. This edition features detailed and up-to-date content, which reflects the technical rigor and data accuracy that are the hallmarks of the publication.

For this edition, Observatório Findes carried out a research with oil companies to confirm investments to be made within the 2025 to 2030 timeframe. Consequently, they confirmed a total of BRL 44.2 billion in investments announced in 8 projects in the state. These investments promise not only to consolidate Espírito Santo's position in the national scenario, but also drive innovations and strengthen the regional economic development.

Observatório Findes reiterates its commitment to providing strategic information to guide investment decisions and public policies, assisting this industry to remain one of the pillars of Espírito Santo's economy.

Enjoy your reading!



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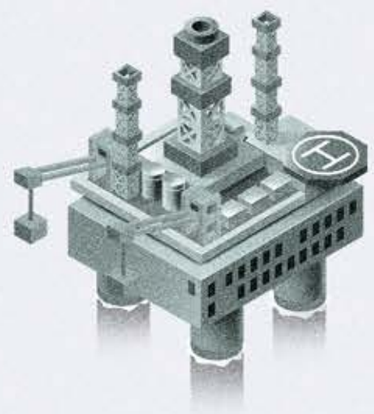

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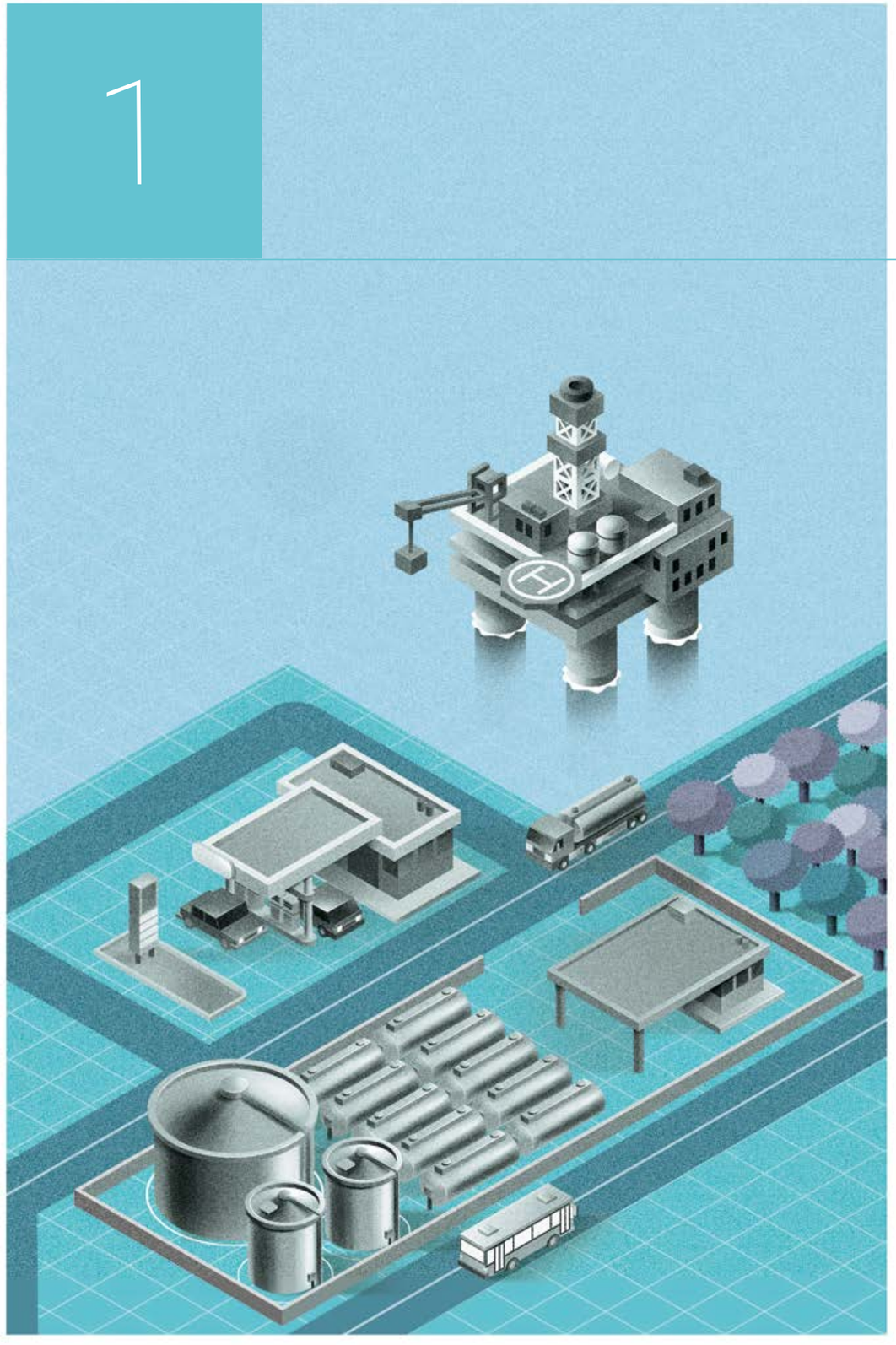


INTERNATIONAL OVERVIEW

OIL AND GAS IN ENERGY TRANSITION

According to the International Energy Agency (IEA), in 2024, global investments in energy surpassed USD 3 trillion around the world. Two thirds of this amount were earmarked for investments in renewable energy. The oil and natural gas industry invested approximately USD 20 billion in 2022 and USD 30 billion in 2023 in clean energy enterprises, with special highlights to the investments in Carbon Capture, Utilization and Storage technologies.

The transition from the current fossil fuel-intensive energy matrix to one with low carbon emissions has influenced structural transformations in the energy sector worldwide. While global records show increasing investments in renewable energies, the oil and natural gas sector continues playing a strategic role throughout this transition, both ensuring energy security, and accumulating experience and essential skills to foster the development of new clean energies.

These structural transformations have already led to changes in the global energy matrix. In 2023, consumption of renewable energy (solar, wind, hydropower, biomass, among others) represented 13.9% of the total primary energy consumption in the world, an increase of 5.2 percentage points (p.p.) when compared to 2022, and 6.5 p.p. in relation to 2003 (Chart 1). It is worth noting that there is also evidence of a growing consumption of these sources among the largest primary energy consumers in the world, especially China and the United States.

Even with the growth of renewable sources, fossil fuels (oil, natural gas and coal) still prevail in the global energy matrix, representing 82.1% of total energy consumption in 2023. Oil alone represented 31.9% of this global demand, with the United States, China and India concentrating 40.4% of this source in the aforementioned year. According to projections of the International Energy Agency (IEA), oil and natural gas consumption will remain significant until 2050, supported by the demand of petrochemical, aviation and navigation industries.

USD 3 trillion

were invested in energy in the world in 2024

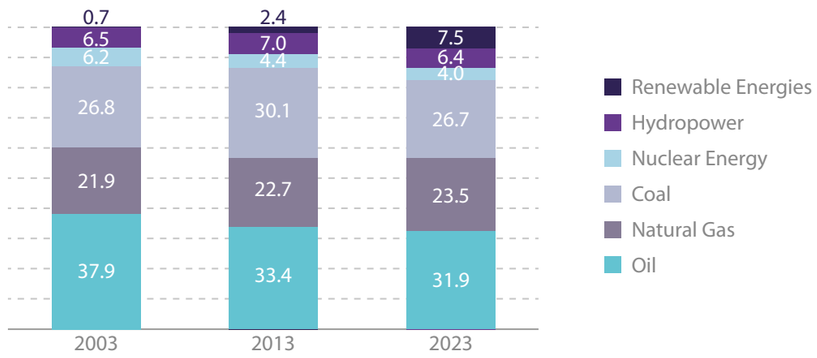
2/3

of this amount were invested in renewable energy

37%

of the investments in Carbon Capture, Utilization And Storage (CCUS) were made by the oil and natural gas industry

Chart 1 - **Primary energy consumption in the world per source (in %)**



Source: Energy Institute Statistical Review of World Energy
Elaboration: Observatório Findes.

In this sense, the Brazilian Institute of Oil and Gas (IBP) defends that the oil and natural gas industry may combine energy security and carbon footprint reduction along the entire chain. In order to do so, the institute highlights the importance of continuously improving energy performance in the sector's operations – such as refining, transportation and distribution – alongside the maximization of renewable energy use, investments in carbon capture technologies and biofuel innovations.

The oil and natural gas industry may combine energy security and carbon footprint reduction throughout the entire chain

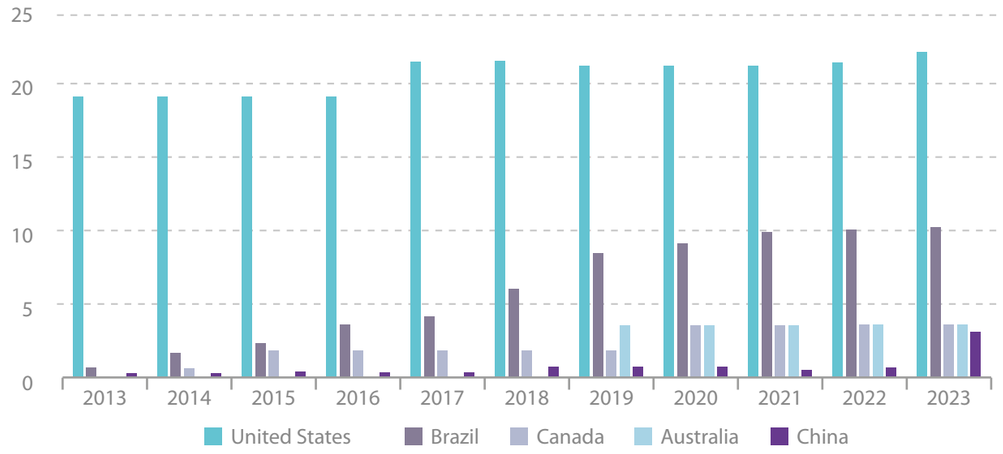
Energy transition does not include only the choice of a clean energy source or the advancement of a specific technology. In order to ensure an assertive energy transition, there must be a plan that considers financial contributions to the diversification of sources, the adaptation of existing infrastructures, the guarantee of energy security, and the development of new technological solutions, such as the Carbon Capture, Utilization and Storage (CCUS).

Carbon Capture, Utilization and Storage (CCUS) include a set of technologies focused on capturing carbon dioxide (CO_2), its proper utilization in production processes and its geologically safe storage, avoiding its release in the atmosphere. According to data from the International Energy Agency (IEA), three fourths of the CO_2 currently captured in large scale facilities derive from oil and gas operations, an industry responsible for 37% of general capital expenditures in CCUS projects.

In 2023, the United States, Brazil and Canada concentrated the largest carbon capture capacity using CCUS. However, it is worth noting that, in the last ten years, technological capacity was enhanced in Canada, China and Brazil (Chart 2), with a 25.4% increase between 2013 and 2023 in Brazil.

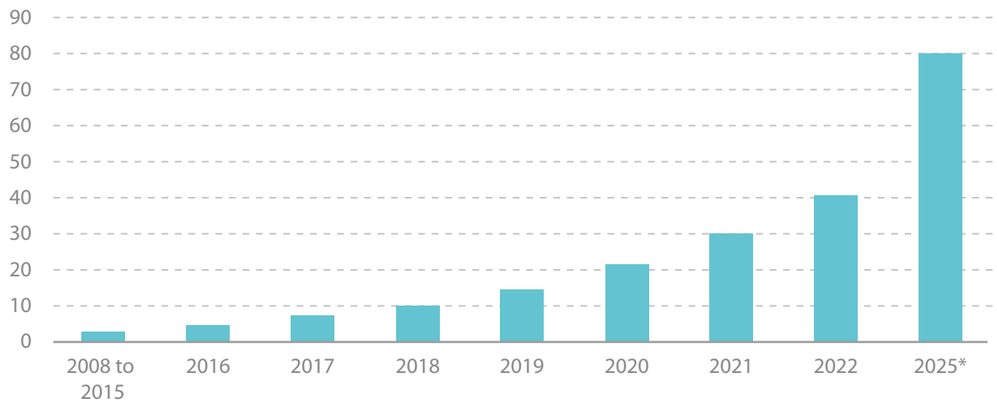
In Brazil, Petrobras has employed this technology in pre-salt exploration since 2008, which enables CO_2 capture and reinjection in oil reservoirs, allowing greater production efficiency while reducing the intensity of emissions. Using this technology, Petrobras has already injected more than 40 million tons of CO_2 in geological reservoirs until 2022 (Chart 3). According to its 2024 sustainability report, the company projects the reinjection of 80 million tons of CO_2 until 2025 through CCUS projects.

Chart 2 - **Main countries with Carbon Capture, Utilization and Storage capacity – CCUS (in million tons per year)**



Source: Energy Institute Statistical Review of World Energy | Elaboration: Observatório Findes.

Chart 3 - **Accumulated reinjection of CO_2 in Petrobras' activities (millions of tons)**



Source: Nossa Energia – Petrobras (Online publication) | Elaboration: Observatório Findes.

96.3 million

bbl/day was the global oil production in 2023

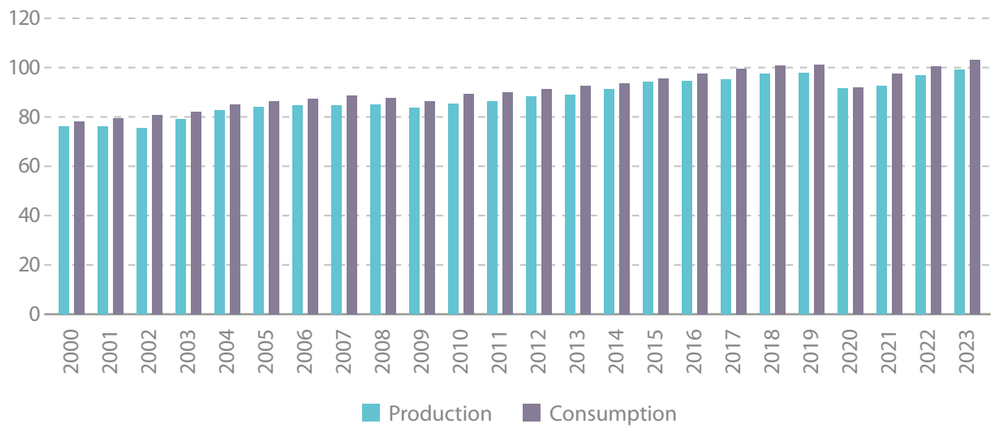
GLOBAL PRODUCTION AND CONSUMPTION OF OIL AND NATURAL GAS

In 2023, oil production reached a record level, exceeding pre-pandemic levels, as did consumption, which also registered significant growth. Conversely, natural gas production and consumption remained practically stable, with slightly significant variations in relation to the previous year.

Global oil production reached 96.3 million barrels per day in 2023, a 2.2% increase in relation to the records from 2022 (Chart 4). In absolute numbers, such an increase represented a growth of 2.1 million barrels of oil per day worldwide. This variation was the determining factor for achieving a record level and surpassing pre-pandemic levels.

Oil production was divided among different regions of the world as follows: Middle East (31.5%), North America (28.1%), Commonwealth of Independent States (14.4%)[1], South and Central America (7.6%), Asia (7.5%), Africa (7,5%), and Europe (3.3%). The main producing countries were the United States, Saudi Arabia and Russia, which altogether represented 43.4% or nearly half of the global production. In 2023, Russia displayed a 1.0% production decrease when compared to 2022, as a result of the sanctions imposed by the European Union and the United States due to the Russo-Ukrainian war. **Brazil remained the 9th largest oil producer in the world and the first among South and Central America countries, with a production of 3.5 million barrels per day**.

Chart 4 - **Production and consumption of oil in the world (million barrels/day)**



Source: BP Statistical Review of World Energy | Elaboration: Observatório Findes.

Regarding global oil consumption, there was a 2.6% increase in 2023 when compared to the previous year (Chart 4), reaching 100 million barrels per day worldwide, which represented a consumption rise of 2.5 million barrels per day in absolute terms.

Consumption distribution among the regions of the world differs from production, with the following division: Asia (38.0%), North America (23.2%), Europe (13.9%), Middle East (9.6%), South and Central America (6.4%), Commonwealth of Independent States (4.6%) and Africa (4.2%). Regionally, North America and Europe displayed a slight increase in oil consumption, with both regions increasing by 0.8% in 2023 compared to 2022.

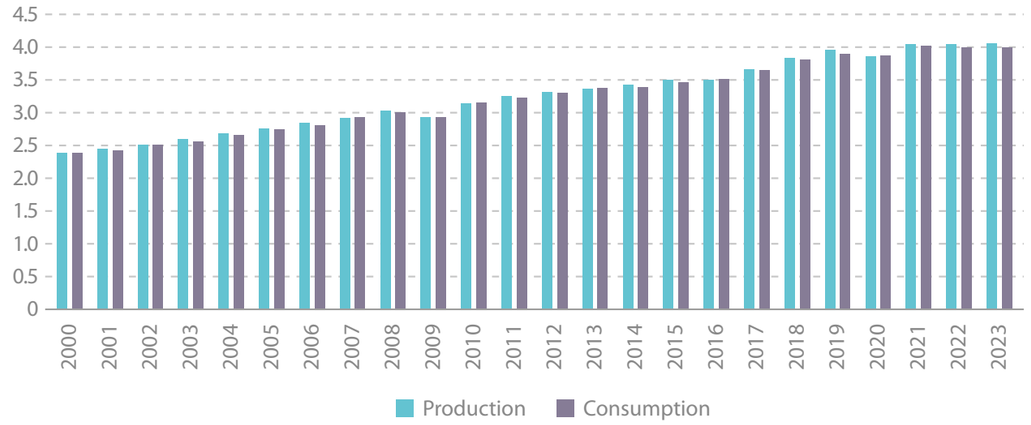
Conversely, Asia and South and Central America displayed the most significant increase in oil consumption, 5.4% and 3.2% respectively. The main consuming countries were the United States, China and India, which altogether represented 40.9% of global consumption. **In this scenario, Brazil remained the 8th largest oil consumer in the world, with 2.5 million barrels per day.**

Regarding natural gas, global production remained stable in 2023, with 4.0 trillion cubic meters (Chart 5). The production of this resource registered an increase of 10.6 billion cubic meters from 2022 to 2023, representing a 0.3% growth.

100 million

bbl/day was the global oil consumption in 2023

Chart 5 - **Natural gas production and consumption in the world (trillions of m³)**



Source: BP Statistical Review of World Energy | Elaboration: Observatório Findes.

1. Member countries: Armenia, Azerbaijan, Belarus, Kazakhstan, Moldavia, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

4.0 trillion
cubic meters per day was the natural gas consumption in 2023

Natural gas production was divided across regions in the following manner: North America (31.1%), Commonwealth of Independent States (19.1%), Middle East (17.6%), Asia (17.0%), Africa (6.2%), Europe (5.0%) and South and Central America (4.0%). The main producing countries were the United States, Russia and Iran, which altogether represented 46.2% of global production. Brazil is the 31st largest natural gas producer in world, with 23.4 billion cubic meters, and it holds the 4th position in the rank considering countries in South and Central America.

Natural gas consumption also remained stable. Worldwide, 4.0 trillion cubic meters of natural gas were consumed in 2023, which represented a minimal 0.05% increase when compared to the previous year.

The distribution of natural gas consumption among the regions of the world occurred as follows: North America (27.5%), Asia (23.3%), Commonwealth of the Independent States (14.9%), Middle East (14.4%), Europe (11.6%), Africa (4.3%) and South and Central America (4.0%). The United States, Russia and China concentrate 41.6% of the world's natural gas consumption. **Regarding the Brazilian consumption of natural gas, the country has remained the 29th largest consumer in the world, with 30.0 billion cubic meters of natural gas, only behind Mexico and Argentina in the context of South and Central America.**

GLOBAL OIL AND NATURAL GAS RESERVES

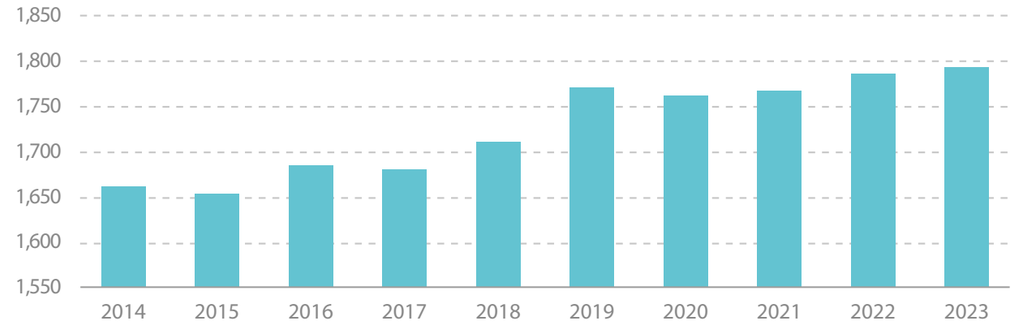
1.79 billion
barrels was the total oil reserves in the world

48.7%	**Middle East**
18.6%	**South and Central Americas**
14.7%	**North America**
8.1%	**CIS**
6.6%	**Africa**
2.6%	**Asia-Pacific**

In 2023, there was a total of 1.79 billion barrels in the world's oil reserves, which represents a 0.3% increase and a stable variation in relation to 2022 (Chart 6). Nevertheless, this was the highest level since 2014.

Oil reserves were distributed worldwide as follows: Middle East (48.7%), South and Central America (18.5%), North America (14.7%), Commonwealth of Independent States (8.1%), Africa (6.6%), Asia-Pacific (2.6%) and Europe (0,7%). Venezuela, Saudi Arabia and Iran concentrate 43.4% of all oil reserves in the world. **Brazil is the 15th country with the largest oil reserve, with 15.9 billion barrels.**

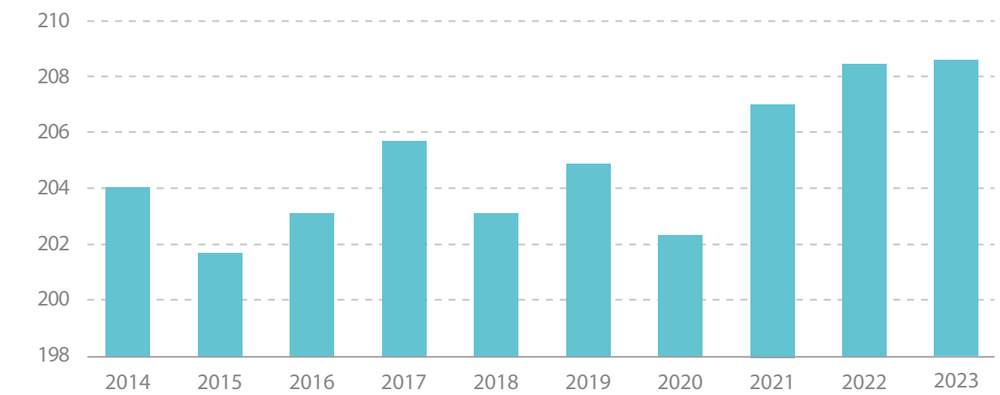
Chart 6 - **Proved oil reserves in the world (billion barrels)**



Source: Eni, World Energy Review 2024 | Elaboration: Observatório Findes.

Regarding natural gas, in 2023 reserves reached 208.7 trillion cubic meters (Chart 7). Natural gas reserves were divided across world regions as follows: North America (10.4%), Middle East (39.8%), Commonwealth of Independent States (31.5%), Africa (7.6%), South and Central America (3.5%), and Europe (1.7%). Russia, Iran and Qatar concentrate 50.3% of all natural gas reserves in the world. **Brazil is the 28th country with the largest natural gas reserve, with 379 billion m³.**

Chart 7 - **Natural gas reserves in the world (trillion m³)**



Source: Eni, World Energy Review 2024 | Elaboration: Observatório Findes.

103.5 million

barrels per day was the installed refining capacity of oil in the world in 2023.

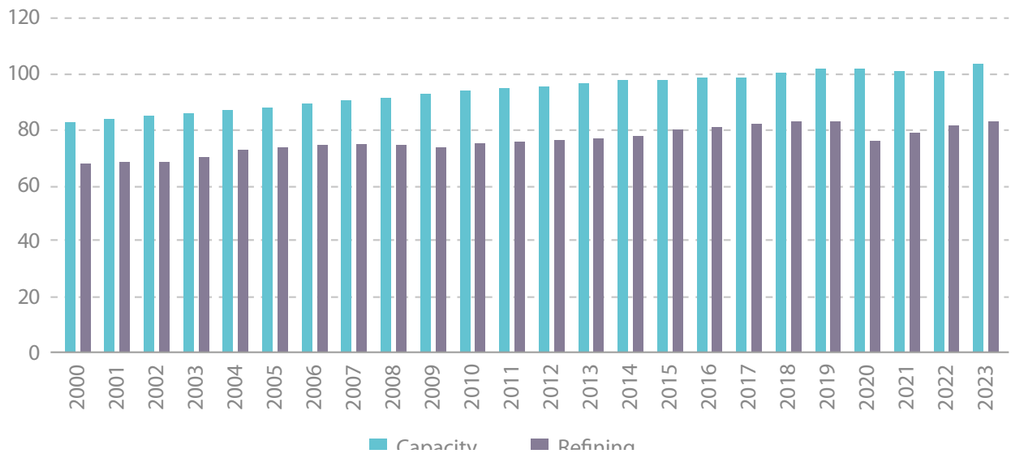
GLOBAL OIL REFINING CAPACITY

Global installed oil refining capacity was 103.5 million barrels per day in 2023. There was an increase of 2.1 thousand barrels daily, or 2.1% in comparison to 2022. Regarding oil refining, 82.9 million barrels per day were refined in 2023, which represents an increase of 1.3 million barrels refined daily in the world, 1.6% higher than the level recorded in the previous year (Chart 8).

Refining capacity was distributed in the following manner across regions worldwide: Asia (36.2%), North America (21.2%), Europe (14.4%), Middle East (11.2%), Commonwealth of Independent States (8.1%), South and Central America (6.0%) and Africa (2.9%). The United States, China and Russia concentrate 42.2% of the global oil refining capacity. **Brazil is the 9th county with the highest refining capacity, with 2.3 million barrels per day.**

Regarding the capacity of oil refineries, the following distribution occurs: Asia (37.3%), North America (22.3%), Europe (14.3%), Middle East (11.3%), Commonwealth of Independent States (8.1%), South and Central America (4.5%) and Africa (2.2%). The United States, China and Russia concentrate 44.3% of all oil refining in the world. **Brazil has the 9th largest oil refining, with 1.9 million barrels per day, advancing one position in comparison to the previous year's classification.**

Chart 8 - **Capacity and Refining of oil in the world (million barrels/day)**



Source: BP Statistical Review of World Energy | Elaboration: Observatório Findes.

REGULATION AND THE CHALLENGES OF THE ENERGY TRANSITION IN THE OIL AND GAS SECTOR

Symone Araújo

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Energy transition is one of the biggest global challenges in the energy sector. The oil and natural gas segment have been increasingly urged to incorporate new renewable sources. Another challenge is the production of more energy with fewer emissions, with a systemic and comprehensive outlook on social and environmental sustainability.

In this context, the National Agency of Petroleum, Natural Gas and Biofuels (ANP) has a pivotal role in the implementation of public policies that promote this transition sustainably, without jeopardizing energy security in the country. ANP is legally responsible for implementing the national policy of oil, natural gas, by-products and biofuels, with emphasis on the guarantee of fuel quality and offer to Brazilian consumers.

For approximately 20 years, ANP has regulated the production and use of biodiesel and ethanol, biofuels that will continue being increasingly highlighted in the Brazilian energy matrix. In 2017, with the creation of RenovaBio, the Agency became responsible for overlooking the greenhouse gas reduction goals of fuel distributors, as a way to contribute to Brazil's commitments to the Paris Agreement, through the energy-environmental efficiency certification of the biofuel production process.

In 2024, new laws reinforced ANP's role in energy transition. In August, the legal framework of low carbon emission hydrogen was published, assigning the Agency with the role of regulating this fuel's production and natural hydrogen exploration and production. In October, the Fuel of the Future law granted ANP the responsibility of regulating carbon capture and storage and established incentive programs for biofuels, such as the sustainable aviation fuel (SAF), green diesel and biomethane. In addition, it also predicted a progressive increase in ethanol levels in gas, and biodiesel levels in diesel oil.

However, these policies are not implemented without challenges. ANP needs to balance the promotion of renewable energies and the maintenance of supply security, which still depend strongly on oil and natural gas. The transition cannot be abrupt, because the scarcity of these resources could cause an increase in energy prices, hampering the national economy and affecting the most vulnerable populations.

Resources from oil and gas exploration have been directed towards the development of technologies focused on decarbonization, energy efficiency and the reduction of environmental impacts.

Brazil, with its comprehensive oil production in pre-salt, has a significantly lower carbon intensity than the global average. This represents a competitive advantage that must be considered in public policies, in order to stimulate an energy transition that favors the development of cleaner technologies without affecting our country's international competitiveness.

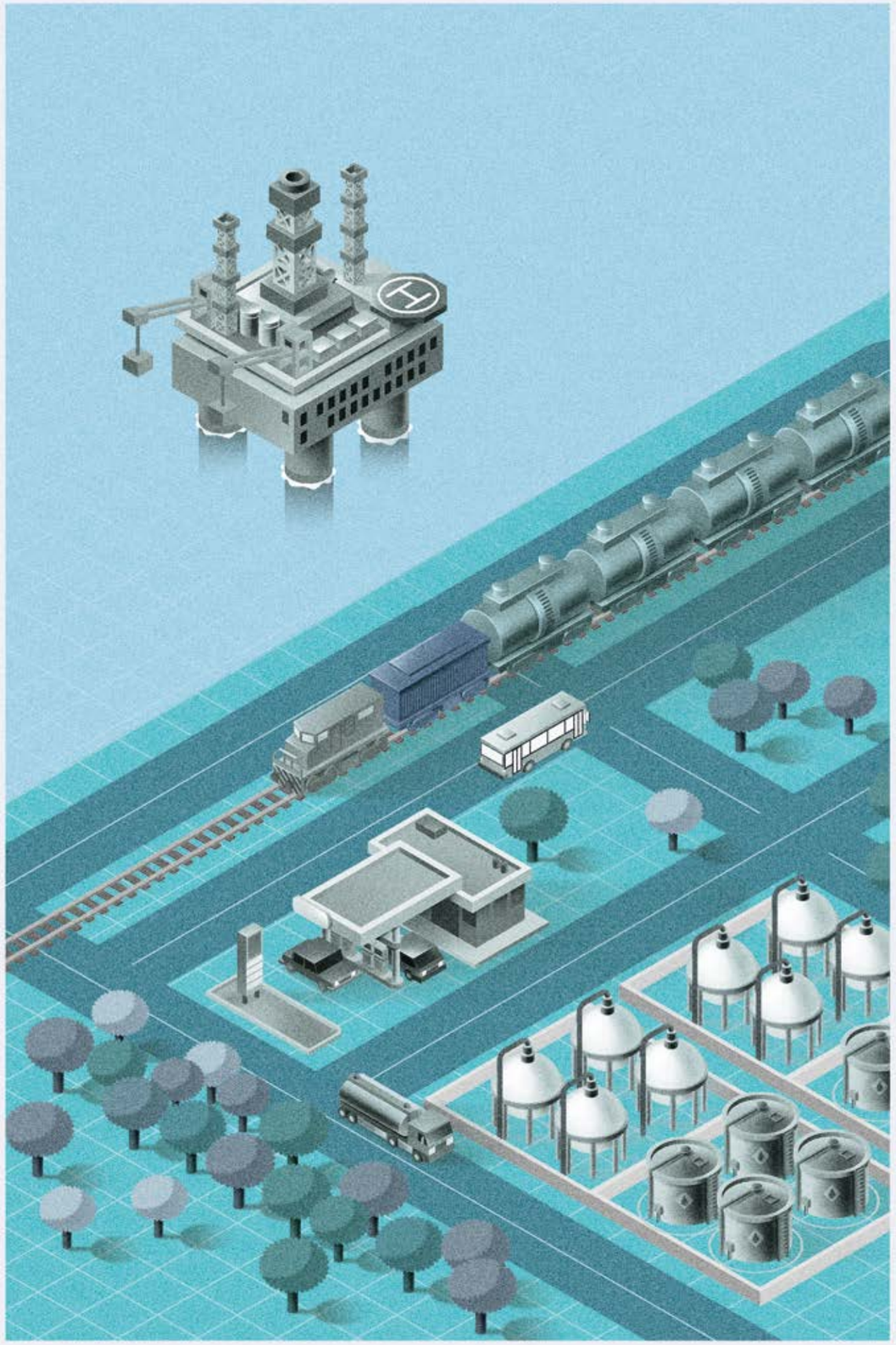
Another key factor is the role of natural gas. It is more environmentally and energetically favorable than other fossil fuels, but it needs to be made available in more attractive conditions for the market. At ANP, we have implemented measures to obtain a more open, dynamic and competitive market, with clear advances, with the increasing participation of independent production – especially in the Northeast – and the effective consolidation of the free market, notably in the Southeast. In addition, the number of oil and natural gas purchase and sale contracts has increased significantly, as well as the number of companies feeding gas into the integrated network.

Another important aspect is the incentive to research, development and innovation (R&D). In 2021, the National Council of Energy Policy (CNPE) published Resolution No. 2/2021, orienting that ANP prioritize the destination of R&D resources to energy transition- related topics. In 2023, 13% of the projects initiated were associated with this theme, with a total estimated investment of BRL 782 million. In 2024, approximately 17% of the projects were related to energy transition, 10% of them to environmental protection and 1% to energy efficiency. This shows that the resources derived from oil and gas exploration have been allocated to the development of technologies focused on decarbonization, energy efficiency and the reduction of environmental impacts.

As ANP, the oil and gas sector is also directly involved in energy transition. It is not by chance that companies in this sector have repositioned themselves to become energy companies, including investments in clean energies in their portfolio.

Therefore, we can state that energy transition is not conflicting with the oil and gas sector. Conversely, it is a great driver of this sector's future. I believe the key term for this process is "energy integration". It is undeniable that, to reach this goal of a just and sustainable transition, fossil fuels will still have an important role in the next few decades.

Lastly, the energy transition in Brazil, particularly in the oil and gas sector, demands balanced regulation that promotes innovation, guarantees energy security and is sensitive to socioenvironmental issues. ANP, in its regulatory and overlooking role, is essential to this process, assisting Brazil's strategic repositioning to face global transition challenges towards a cleaner and more sustainable energy matrix.



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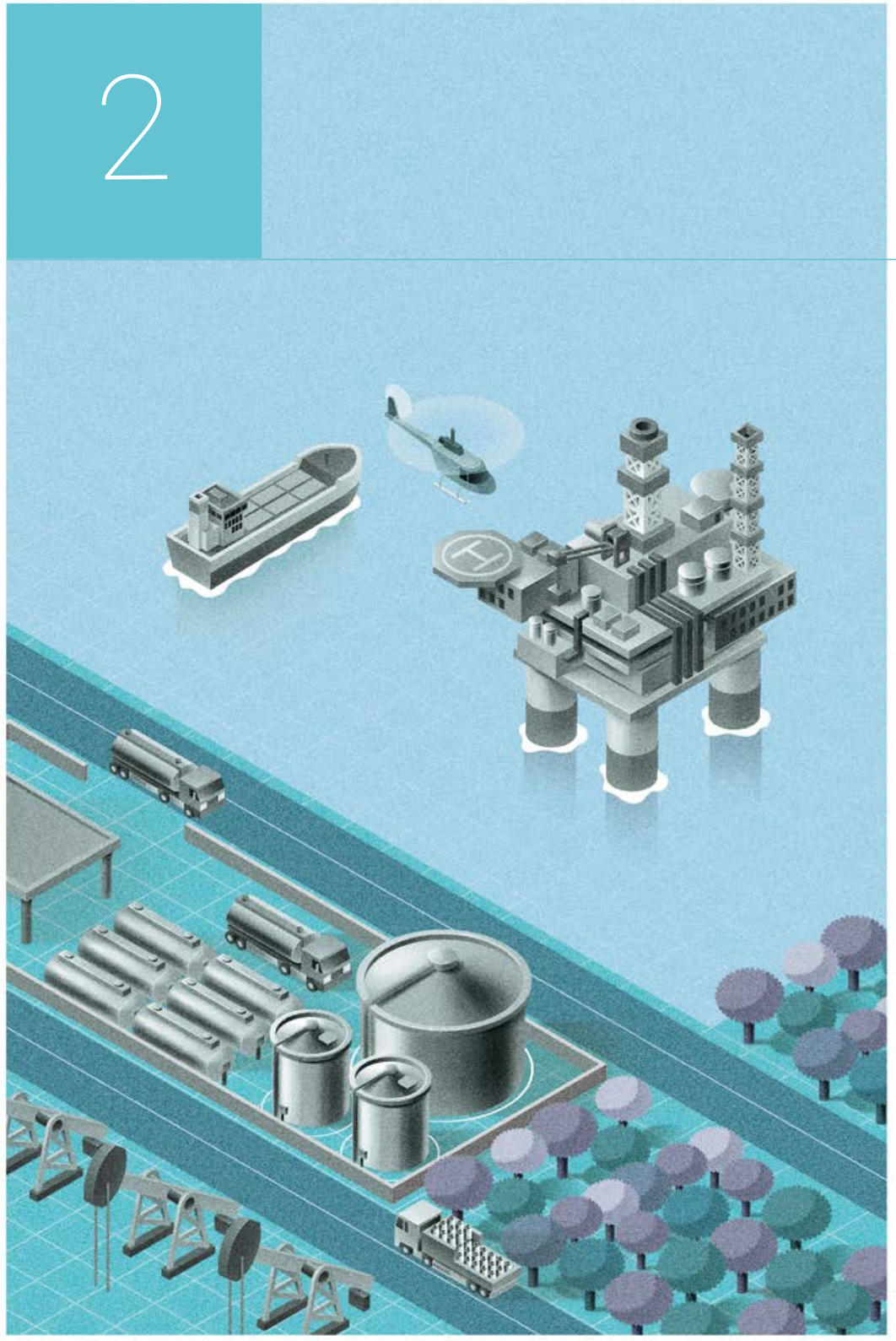


OIL EXPLORATION AND PRODUCTION IN ESPÍRITO SANTO

The state of Espírito Santo's territory encompasses two sedimentary basins that produce oil and natural gas. To the North, the Espírito Santo Basin has exploration fields and blocks, both onshore and offshore. To the South, a portion of the Campos Basin includes pre-salt areas, with offshore fields and blocks on the border of Espírito Santo's territory.

In total, Espírito Santo had 39 production fields by the end of 2024, from which 19 were mature, with 363 operational wells in that year. Most hydrocarbons were extracted from offshore areas, representing 95% of the oil production and 97% of the natural gas production in 2024. Therefore, the evolution of offshore extraction determined the total volume produced by the state, a trend that must remain in the next few years.

In addition, in 2024, Espírito Santo had seven fields under development, four of them were onshore and three were offshore. They are the following: Batuíra, operated by Capixaba Energia; Caxaréu and Mangagá, operated by Petrobras; Lagoa Parda Sul, operated by Imetame; Mosquito and Saíra, by Origem; and Wahoo, by PRIO.

In total, 27 companies had fields in exploration, development and production phases in Espírito Santo. Petrobras was the main player, operating the extraction at Parque das Baleias, in the Campos Basin, in 2024. This park was responsible for 73.9% of the offshore oil production and 74.9% of the natural gas production in the state.

354

oil and natural gas production wells in Espírito Santo in 2024

DRILLING ACTIVITY IN ESPÍRITO SANTO

The drilling activity in the oil and natural gas industry has several purposes, including the collection of geological data to understand the geology of the subsoil and identify the presence of hydrocarbons, which is essential during the exploration phase; the commercial extraction of oil and natural gas after confirmation of viable reserves; the injection of fluids, such as water or carbon dioxide, to improve oil recovery and increase reservoir pressure; and the installation of monitoring equipment that allows following up on pressure and fluid composition, optimizing production management. By monitoring this activity, it is possible to accompany the evolution of the exploration phase and the region's future oil and natural gas production.

In Espírito Santo, this activity began in

95%

of the oil production and

97%

of the natural gas production came from offshore areas in Espirito Santo in 2024

16

offshore wells were drilled in 2024

1959 with the drilling of an onshore well in Conceição da Barra, located in the Espírito Santo Basin. Since then, 2,384 wells were drilled in Espírito Santo. Among them, 1,792 were drilled onshore and 592 offshore.

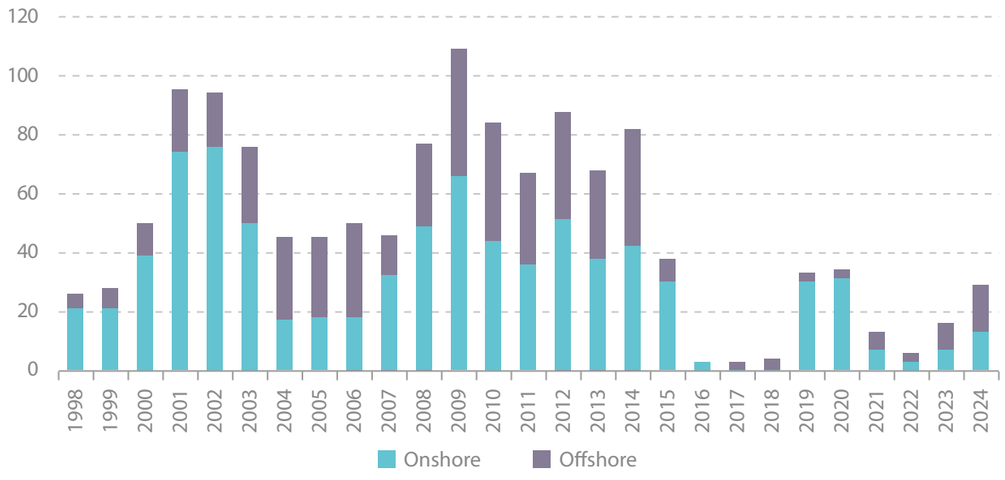
In 2024 alone, the drilling process of 29 wells was initiated in Espírito Santo (16 offshore and 13 onshore), an 81.3% increase in comparison to the previous year. From this total, 16 wells were classified as development wells (55.2%), four were classified as injection wells (13.8%) and nine received other classifications by ANP (31.0%).

Regarding development wells (16 of them), those used for oil and/or natural gas extraction, 11 were drilled onshore in the Inhambu Field, one was drilled onshore in the Rio Ipiranga Field – both in the Espírito Santo Basin – and four offshore in the Jubarte Field, in the Campos Basin.

As for the injection wells (four), all of them were drilled in the Jubarte Field. This type of drilling is used to inject water, gas or steam, with the purpose of maintaining the reservoir pressure and improving the production recovery factor. It is worth noting that the drilling activities in the Jubarte Field are part of the Integrated Project of Parque das Baleias (IPB), with the purpose of interconnecting 17 wells to the Floating Production, Storage and Offloading unit (FPSO) Maria Quitéria. Among them, nine wells are used for oil production and eight are used for water injection. The FPSO became operational in the south of the state in October 2024.

Regarding exploration wells, used to discover new oil and natural gas fields, Espírito Santo drilled a total of 333 wells since 1998, which represented 19% of all exploratory drilling activities performed in Brazil. From this total, 716 wells were drilled offshore and 196 onshore.

Chart 9 - **Total of wells drilled in Espírito Santo (in units)**



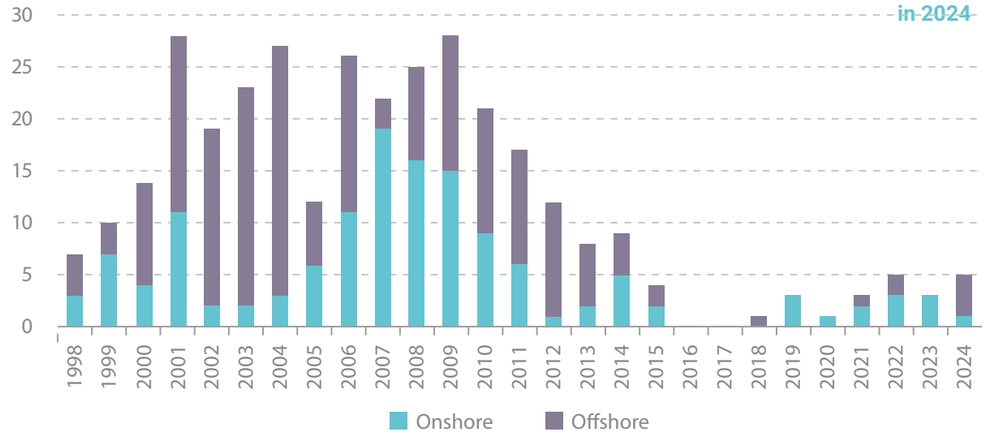
Fonte: ANP | Elaboração: Observatório Findes.

Only in 2024, five wells were drilled in Espírito Santo, which represented 38% of all exploration wells drilled in Brazil. Petrobras drilled four offshore exploratory wells, all located at the eastern margin of the Espírito Santo Basin, in blocks ES-M-596 and ES-M-673. Signs of natural gas were found in Block ES-M-596 in 2021. The oil company BGM drilled an offshore well in block ES-T-516.

13

onshore wells were drilled in 2024

Chart 10 - **Exploration wells drilled in Espírito Santo (in units)**



Source: ANP | Elaboration: Observatório Findes.

SIGNS OF HYDROCARBONS

After drilling, in case the exploration activity indicates the presence of hydrocarbons, the oil company must issue a Notification of Discovery of Signs of Hydrocarbons to the ANP (National Petroleum Agency). Since 1998, when this notification became mandatory, 239 notifications were issued in Espírito Santo, 45% in onshore areas and 55% in offshore areas. This figure represented 23% of all declarations registered in Brazil during the same period.

It is worth highlighting that, since 2022, Espírito Santo issued only onshore notifications of signs of hydrocarbons. The last offshore notification was issued in 2021 in the Block ES-M-669, located at the eastern margin of the Espírito Santo Basin, where Petrobras drilled the deepest oil well in Brazil (Monai), with 7,699 meters of depth.

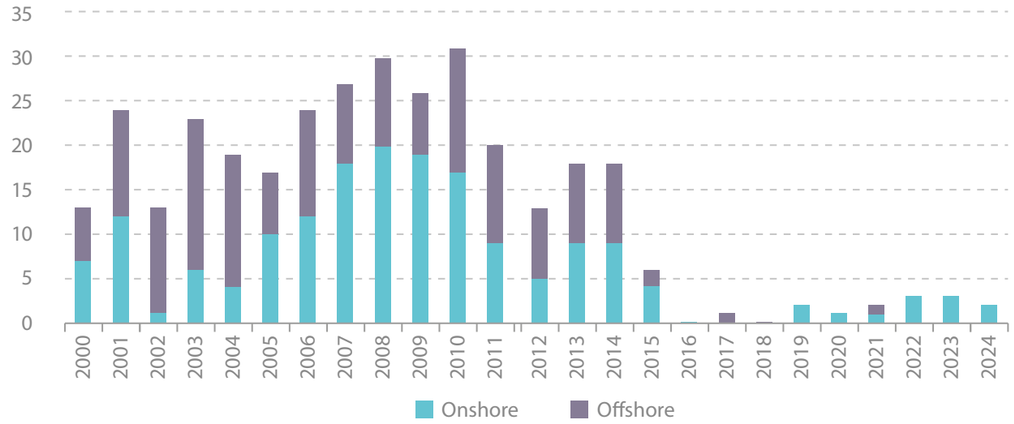
In 2024, only a single notification of discovery of signs of hydrocarbons was issued in Espírito Santo, in block ES-T-516, operated by BGM. The fluid discovered was oil.

239

notifications of hydrocarbons were issued in Espírito Santo since 1998

After identifying signs of hydrocarbons and issuing the Notification of Discovery (ND), the next contractual step for the block operator is presenting a Discovery Assessment Plan (PAD, in Portuguese) to ANP. This document includes a work program including the activities, deadlines and necessary investments to assess the techno-economic feasibility of a recently discovered field in exploration phase.

Chart 11 - **Notificação de Descoberta de Indício de Hidrocarbonetos no Espírito Santo (em unidades)**



Fonte: ANP | Elaboração: Observatório Findes.

2

notificações de hidrocarboneto foram emitidas no Espírito Santo em 2024

ES-T-516
ES-T-345

In 2024, the state of Espírito Santo had two active Discovery Assessment Plans, which means they were within the block's contractual exploration phase deadline. Among them, one is located onshore and the other at offshore. The onshore Block ES-T-487 (Águia Real), operated by Capixaba Energia, had its Declaration of Commerciality issued in 2023, within the contractually defined deadline for the end of its exploration phase. The offshore Block ES-M-669, in the Espírito Santo Basin, is predicted to conclude its techno-economic feasibility studies to 2026.

In addition to the aforementioned plans, three other PADs are undergoing the process of postponing their Declarations of Commerciality. This occurs when companies request additional time to ANP (exceeding the contractually defined deadline for the exploration phase) to conclude their discovery assessments before deciding on commercial feasibility. These assets undergoing the postponement process include Block C-M-10, where the Wahoo field is located, whose Declaration of Commerciality was issued in 2021. Regarding blocks ES-M-525 and ES-M-414, they will be assessed until 2026 at the earliest.

Table 1 - **Ongoing Discovery Assessment Plans (PADs) in the exploration phase in Espírito Santo**

STATUS	BLOCK	BASIN	ENVIRONMENT	OPERATOR	CONTRACTORS	EFFECTIVE START	EXPECTED END
Postponement of the Declaration of Commerciality	C-M-101	Campos	MAR	Petro Rio Jaguar	Petro Rio Jaguar (64.3%) IBV Brasil Petróleo (35.7%)	01/12/2011	03/30/2028
	ES-M-525	Espírito Santo	MAR	BW Maromba	BW Maromba (76.5%) Aquamarine (23.5%)	12/05/2012	03/29/2025
	ES-M-414	Espírito Santo	MAR	3R Petroleum Off	3R Petroleum Off (100%)	01/08/2014	02/01/2026
Active	ES-T-487	Espírito Santo	TERRA	Capixaba Energia	Capixaba Energia (100%)	01/08/2021	12/30/2024
		Espírito Santo	MAR	Petrobras	Petrobras (100%)	08/25/2022	11/10/2026

Source: ANP | Elaboration: Observatório Findes.

DECLARATIONS OF COMMERCIALITY

Based on technical and economic feasibility studies conducted through the Discovery Assessment Plans (PADs), the company will have all necessary information to determine whether the area is economically feasible for the commercial exploration of oil and natural gas. If feasibility is confirmed, a Declaration of Commerciality is issued to ANP. The issuance of this declaration marks the end of the block's Exploration Phase and, consequently, the beginning of the Production Phase of an oil and/or natural gas field.

Since 1999, 64 Declarations of Commerciality have been issued in Espírito Santo, 68.7% of which correspond to onshore areas and 31.3% to offshore areas. In the past two years, six of these declarations were granted for onshore areas in the state. The most recent declaration for an offshore area was issued in 2021, for the Wahoo Field.

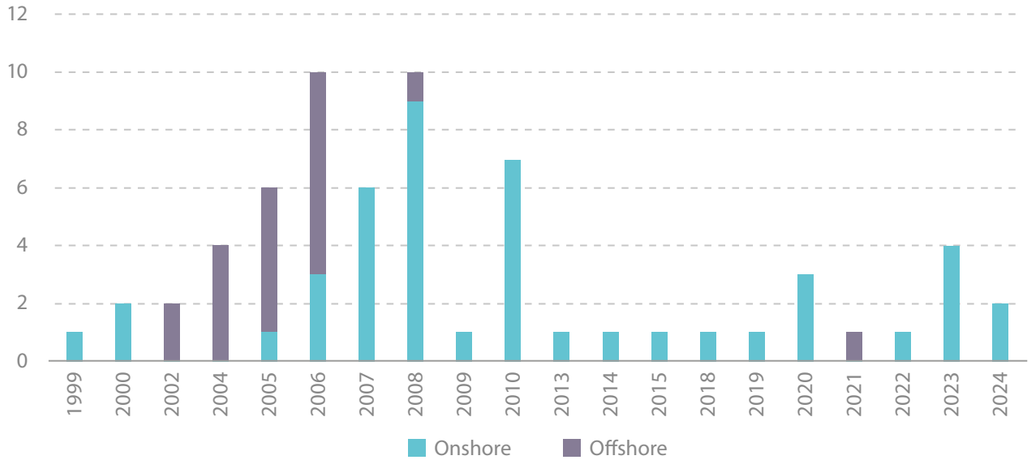
In 2023, four Declarations of Commerciality were issued in the state, all for onshore areas. The companies BGM and Imetame issued one declaration each, for the Muriqui and Lagoa Parda Sul fields, respectively. The operator Capixaba Energia issued two declarations, for the Águia Real and Batuíra fields, which are part of Blocks ES-T-487 and ES-T-441, respectively – both acquired during the 14th ANP Bidding Round.

In 2024, two additional Declarations of Commerciality were issued for the onshore portion of the Espírito Santo Basin: one for the Mosquito Field and another for the Saíra Field. Both are operated by Origem Energia through the consortium formed by Origem Energia Alagoas S.A. (50%) and Origem Energia S.A. (50%).

64

declarations of commerciality were issued in Espírito Santo since 1999

Chart 12 - **Declarations of Commerciality in Espírito Santo (in units)**



Source: ANP | Elaboration: Observatório Findes.

1.2 OIL AND NATURAL GAS RESERVES

1.2 billion
barrels of oil was the reserve of this resource in Espírito Santo In 2023

32.0 billion
cubic meters of natural gas was the reserve of this resource in Espírito Santo in 2023

In 2023, latest available ANP data, Brazil's, Brazil's total reserves reached 27.5 billion barrels of oil and 704.7 billion cubic meters of natural gas, volumes 2.26% and 19.9% higher, respectively, than those recorded in the previous year.

For Espírito Santo, in 2023, reserves reached 1.2 billion barrels of oil and 32.0 billion cubic meters of natural gas, recording a growth of 9.3% and 15.4%, respectively, compared to 2022. As a result, the state maintained the third-largest oil reserve and the fourth-largest natural gas reserve in Brazil. This growth was driven mainly by the inclusion of reserves from the Wahoo Field under development in the Campos Basin and the onshore fields of Águia Branca, Batuíra, and Lagoa Parda Sul in the Espírito Santo Basin.

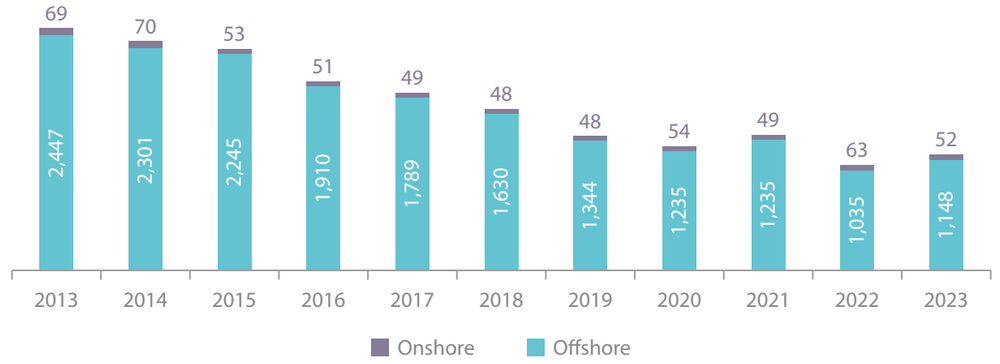
The indicator that assesses the service life of reserves which will maintain their production throughout this period[2] demonstrated that Espírito Santo's oil reserves currently have a proved service life of 11 years, maintaining production in the levels of 2023. Likewise, in relation to natural gas, the indicator demonstrated that Espírito Santo's reserves also have a service life of 11 years. For Brazil, this indicator was 13 years for oil and nine years for natural gas.

In 2023, the offshore environment concentrated 95.6% of Espírito Santo's oil reserves, while only 4.4% of the reserves were located onshore. In that year, offshore reserves grew by 0.9% in comparison to the previous year, reaching 1.1 billion barrels, while the onshore reserves recorded a 17.3% reduction, reaching 52 million barrels.

With regard to natural gas, in 2023, Espírito Santo reached 31.2 billion cubic meters of reserves in offshore areas, registering a 15.3% increase compared to the previous year. As a result, the state regained its second place among the federal units with the largest offshore reserves of this resource, behind only Rio de Janeiro (519 billion cubic meters) and ahead of São Paulo (29.7 billion cubic meters).

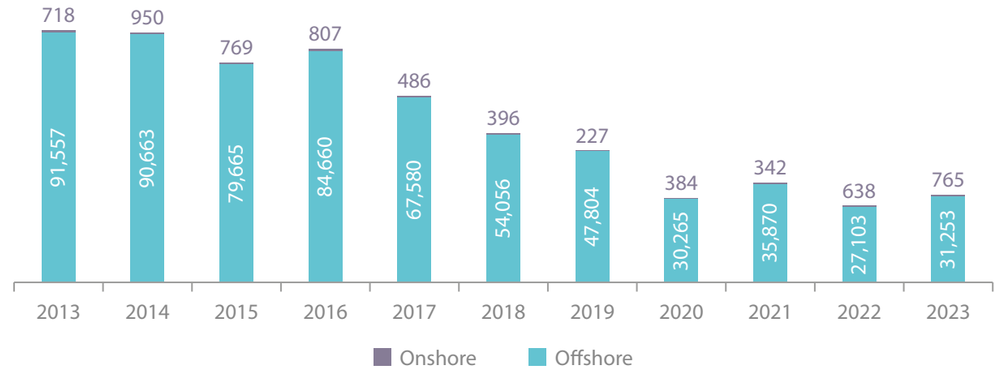
In the onshore area, which accounts for only 2.4% of Espírito Santo's natural gas reserves, the availability of this resource totaled 765 million cubic meters in 2023, representing a 20% increase compared to the volume estimated in 2022.

Chart 13 - **Total oil reserves in Espírito Santo (in million barrels)**



Source: ANP | Elaboration: Observatório Findes.

Chart 14 - **Total natural gas reserves in Espírito Santo (in billion m³)**



Source: ANP | Elaboration: Observatório Findes.

2. The indicator is calculated based on the ratio between proved reserves and oil and natural gas production. The higher the value of this indicator, the longer the time available for the production of these resources.

154.9 thousand

barrels per day was the oil production in Espírito Santo in 2024

TOTAL OIL AND NATURAL GAS PRODUCTION

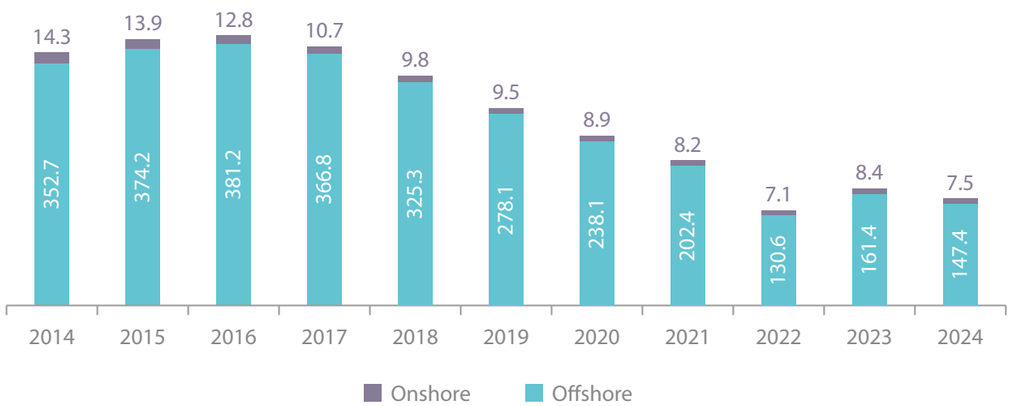
In 2024, Brazil's oil production reached 3.35 million barrels per day, recording a 1.3% decrease compared to the previous year's output of 3.4 million barrels per day. Throughout 2024, production was concentrated in three states: Rio de Janeiro (86.8%), São Paulo (6.1%), and Espírito Santo (4.6%).

Espírito Santo recorded an average daily oil production of 154.9 thousand barrels in 2024, a volume 8.5% lower than in the previous year. As a result, the state maintained its third place in the oil production rank among federal units. Between 2011 and 2018, Espírito Santo held the second position among the largest oil-producing states. However, in 2019, the position was surpassed by São Paulo, which experienced significant growth in pre-salt production.

In 2024, Brazil's average daily natural gas production was 153 million cubic meters (m³/d), a 2.0% increase over the volume registered in 2023. Production was concentrated in four states: Rio de Janeiro (74.3%), Amazonas (9.3%), São Paulo (7.7%), and Espírito Santo (2.4%).

In Espírito Santo, average production was 3.6 million cubic meters per day, a 12.8% decrease compared to the previous year's volume. This result maintained the state in fourth place among the country's largest daily producers of natural gas.

Chart 15 - **Total oil production in Espírito Santo (thousand barrels/day)**



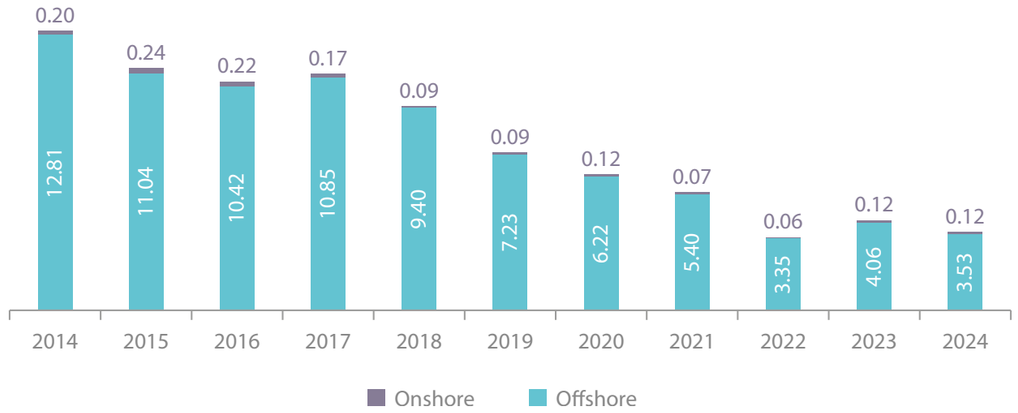
Source: ANP | Elaboration: Observatório Findes.

3.6 million

cubic meters per day was the natural gas production in Espírito Santo in 2024

Total oil and natural gas production in Espírito Santo remained relatively stable until October 2024. However, in the last two months of the year, there was a significant drop that impacted the annual performance. This decline occurred mainly in the Jubarte Field, the state's main operation, and was associated with the commissioning of FPSO Maria Quitéria. The commissioning process of the new platform required the interconnection of wells to the new unit and the disconnection of older facilities, which reduced oil and natural gas production during this period. Despite this scenario, the volume produced in 2024 remained above the level recorded in 2022, when the state reached the lowest output of the past decade (Chart 16).

Chart 16 - **Total natural gas production in Espírito Santo (million m³/day)**



Source: ANP | Elaboration: Observatório Findes.

OFFSHORE OIL AND NATURAL GAS PRODUCTION

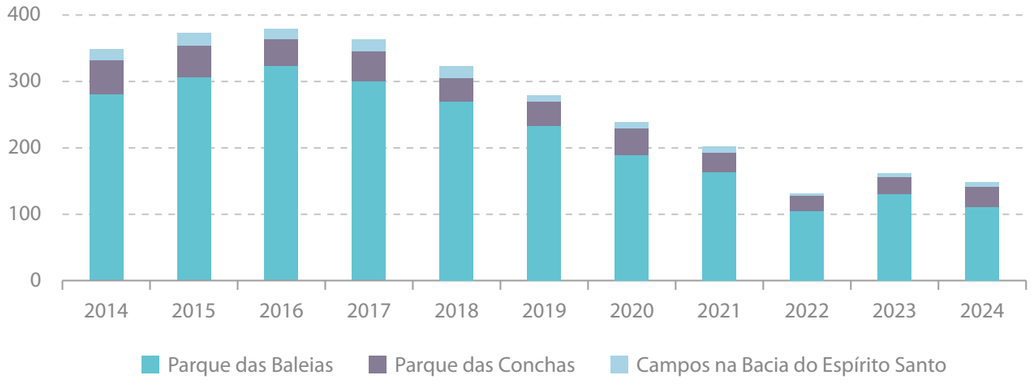
In 2024, the average offshore oil production in Espírito Santo was 147.4 thousand barrels per day (bbl/day), an 8.7% decrease compared to the volume recorded the previous year. For natural gas, average production was 3.5 million cubic meters per day, a 13.1% drop compared to 2023.

Offshore oil and natural gas production in Espírito Santo can be divided into three areas, based on location. Two of them are in the Campos Basin, in the production fields of Parque das Baleias[3] and Parque das Conchas[4]. The third area is located in the Espírito Santo Basin, in the respective production fields.

In Parque das Baleias, oil production fell by 11.4% in 2024, totaling **114.6 thousand barrels per day (bbl/day).** The area accounted for 73.8% of Espírito Santo's total oil production. As for natural gas, the park produced 2.73 million cubic meters per day, a 14.5% decrease compared to 2023. These declines occurred in the Jubarte Field due to the start-up of the FPSO Maria Quitéria, whose commissioning required the interconnection and disconnection of wells to the platform, impacting production.

In Parque das Conchas, production reached 25.4 thousand barrels of oil per day (bbl/day) and 0.28 million cubic meters per day (m³/day) of natural gas, registering decreases of 2.2% and 1.3%, respectively. The area accounted for 16.4% of total oil production and 7.6% of natural gas production in Espírito Santo. This performance was influenced by lower output in the Abalone (-50.0%) and Argonauta (-6.1%) fields, partially offset by the expansion in the Ostra Field. As there were no scheduled maintenance shutdowns during the year, this reduction may be related to operational factors in these assets.

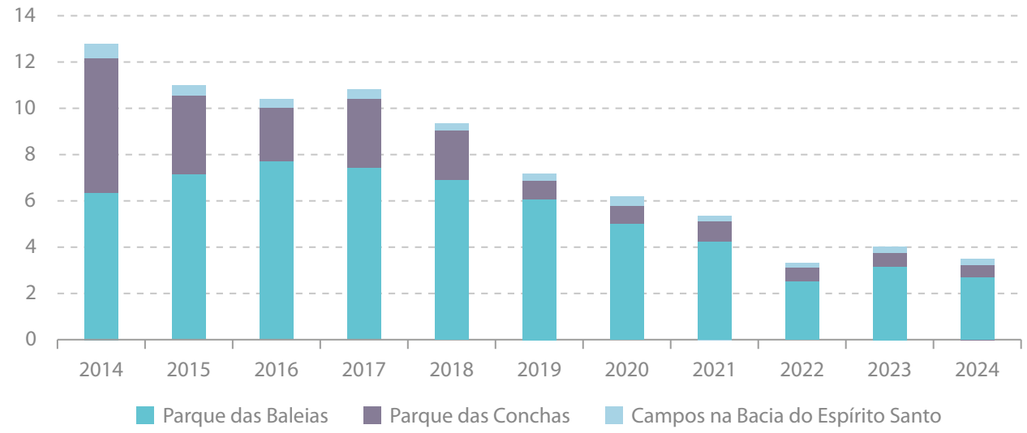
Chart 17 - **Offshore oil production in Espírito Santo by location (thousand barrels/day)**



Source: ANP | Elaboration: Observatório Findes.

On the other hand, oil production in the offshore fields of the Espírito Santo Basin increased by 26.3%, reaching 7.3 thousand barrels per day (bbl/day) in 2024. This growth was driven by increased output in the Golfinho Field (25.4%), operated by BW Energy, and the Cangoá Field (22.0%), operated by 3R Petroleum. These gains reflect revised production strategies for these assets following acquisition from Petrobras by their respective operators. Meanwhile, natural gas production in the Espírito Santo Basin fell by 11.1% compared to the previous year, totaling 518.2 thousand cubic meters per day.

Chart 18 - **Offshore natural gas production in Espírito Santo by location (million m³/day)**



Fonte: ANP | Elaboração: Observatório Findes.

ONSHORE OIL AND NATURAL GAS PRODUCTION

In 2024, Espírito Santo's average onshore oil production was 7.5 thousand barrels per day (bbl/day), a 10.4% decrease compared to the previous year. Natural gas extraction totaled 116.2 thousand cubic meters per day (m³/day), a volume 4.3% lower than in 2023.

In terms of geographic distribution, 95.8% of the state's onshore oil production was concentrated in ten production fields: Fazenda Alegre (37.7%), Cancã (14.8%), Fazenda São Rafael (9.8%), Inhambu (7.7%), Fazenda Santa Luzia (6.8%), Jacutinga

3. In 2019, ANP and Petrobras signed an agreement involving the park's reservoirs for the purpose of royalties and special participation payments. The agreement considered only one reservoir, designated Novo Campo de Jubarte, which included the areas encompassing Jubarte, Baleia Azul, Baleia Franca, parts of Cachalote, Mangangá, and Pirambu. The signing of this document also enabled the approval of a new Development Plan for the Novo Campo de Jubarte, extending the Production Phase for another 27 years.

4. Comprising the Abalone, Argonauta, and Ostra fields.

(4.1%), Lagoa Parda (4.1%), São Mateus Leste (4.1%), Fazenda São Jorge (3.2%), Fazenda Cedro (1.9%), and Irara (1.6%).

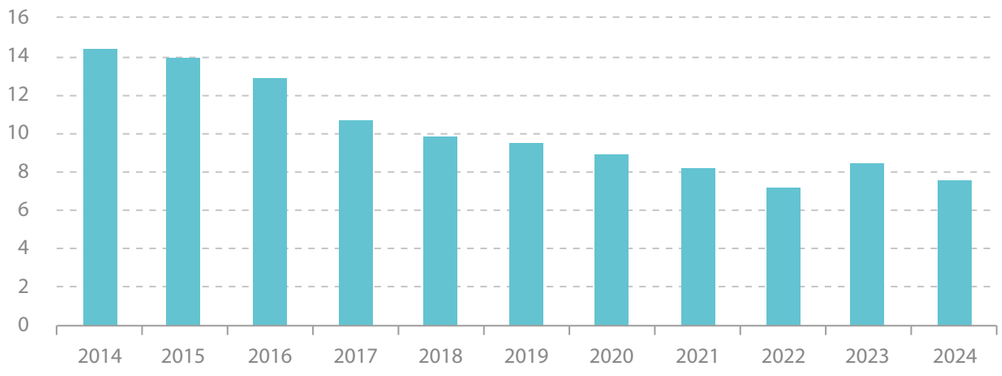
In total, six of these fields recorded a decrease in oil production in 2024 compared to 2023: Fazenda Alegre (-11.4%), Inhambu (-33.8%), Jacutinga (-33.8%), Lagoa Parda (-23.0%), Fazenda São Jorge (-29.8%), and Fazenda Cedro (-15.7%). On the other hand, Cancã (+14.1%), Fazenda São Rafael (+22.5%), Fazenda Santa Luzia (+1.5%), and Irara (+34.1%) showed growth in oil extraction over the same period.

Espírito Santo's onshore natural gas production was concentrated in five fields, which accounted for 90.9% of the state's total onshore extraction volume in 2024.

The São Mateus Leste Field led with 48.0% of onshore production, followed by Fazenda Alegre (14.5%), Fazenda Santa Luzia (14.2%), Lagoa Parda (8.0%), and Fazenda São Rafael (6.3%).

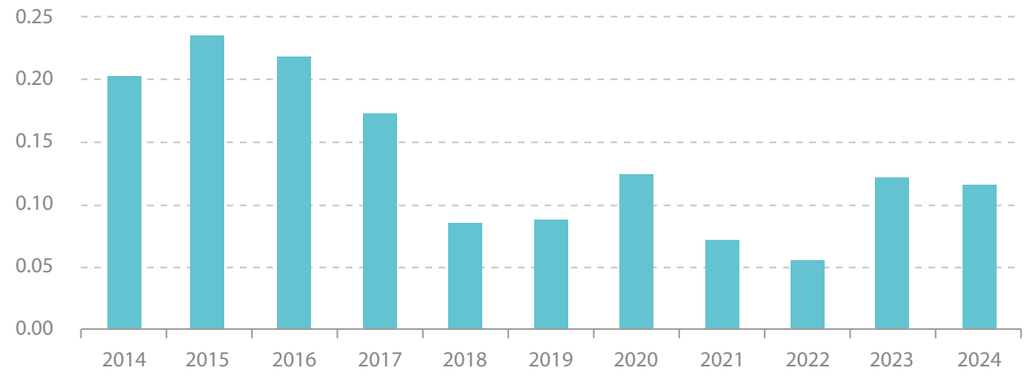
The fields that most contributed to the decline in onshore natural gas production in Espírito Santo in 2024 were Fazenda São Rafael (-25.5%), Rio Ipiranga (-16.3%), and Jacutinga (-19.4%). However, this decline was partially offset by increased volumes extracted mainly in São Mateus Leste (+2.6%), Fazenda Alegre (+6.9%), and Fazenda Santa Luzia (+22.4%). Finally, Secrest, Capixaba Energia, and Imetame Energia were the operators with the largest shares of the state's onshore oil and natural gas production in 2024.

Chart 19 - **Onshore oil production in Espírito Santo (thousand barrels/day)**



Source: ANP | Elaboration: Observatório Findes.

Chart 20 - **Onshore natural gas production in Espírito Santo (million m³/day)**



Source: ANP | Elaboration: Observatório Findes.

PROJECTION OF THE OIL AND NATURAL PRODUCTION

For the third consecutive year, Observatório Findes presents the projection scenarios for both onshore and offshore oil and natural gas production in Espírito Santo. The purpose of this initiative is to provide the agents in this industry with greater predictability, anticipating scenarios and guiding the actions of public and private administrations.

The calculation methodology utilizes accounting rules to capture production trends with a focus on the regional offer of these resources. Based on the thorough analysis of hydrocarbon offers in the exploration and production phases of each field, operator and platform, values were projected until 2030. Furthermore, calculations were carried out with the objective of reproducing the historical production patterns of each production well in the state.

Between 2024 and 2027, both oil and natural gas are expected to grow in Espírito Santo's total production. This increase is predicted mainly for the Integrated Project of Parque das Baleias (IPB), from Petrobras; the Wahoo Field, under operation of PRIO, and the Golfinho Field, managed by BW Energy, all located offshore. In the onshore environment, the production increase is expected to be derived from recent oil discoveries found in the last few years.

It is estimated that Espírito Santo's oil and natural gas production will register growth between 2024 and 2027

From 2028 onwards, the natural productivity decrease in the fields will result in a decrease of offshore production, whereas the reduction of onshore production is projected to begin in 2030.

For oil, between 2024 and 2027, an average annual growth of 11.2% is expected, reaching a volume of 213.1 thousand barrels per day in 2027. For natural gas, projections indicate an average annual growth of 10.4% for the same period, with a production volume of 4.9 million cubic meters per day (m³/day) in 2027.

11.5%

is the average annual increase expected for offshore oil production between 2024 and 2027 in Espírito Santo

10.8%

is the average annual increase expected for the offshore natural gas production between 2024 and 2027 in Espírito Santo

PROJECTION OF THE OFFSHORE PRODUCTION IN ESPÍRITO SANTO

Offshore production represents most of Espírito Santo's production volume, and this trend must persist in the next few years. Likewise, oil production is associated with natural gas production, which may maintain this pattern throughout the period projected.

The highest oil production levels for the projected period must be achieved in 2027, while natural gas must reach its peak production in 2026. Between 2024 and 2027, an average annual growth of 11.5% is predicted for offshore oil production, which represents 204.4 thousand barrels per day (bbl/d) in 2027 (Chart 21). For natural gas, an average annual growth of 10.8% is expected for the same period, with a daily production of 4.8 million cubic meters per day (m³/d) in 2027 (Chart 22).

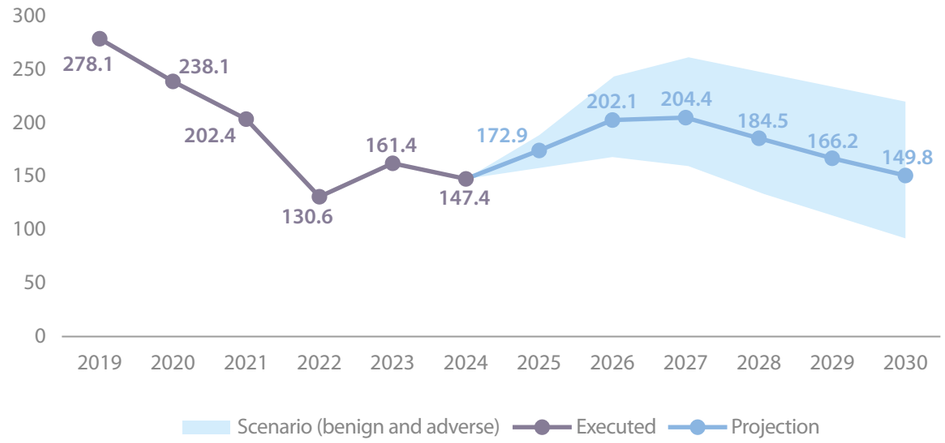
Analyzing the full period projected, between 2024 and 2030, the expectation is an average annual growth of 0.4% in oil production and 0.3% in natural gas production. It is worth highlighting that, despite this decrease, the expected production volume for 2030 will remain above 2024 production rates, when the average oil production was 154.9 thousand barrels per day and the average natural gas production was 3.6 million cubic meters per day (m³/day).

Throughout the period projected from 2024 to 2030, an average annual growth of 0.3% in offshore oil production and 0.3% in offshore natural gas production. In 2030, production is expected to reach 149.8 thousand barrels of oil per day and 3.6 million cubic meters of natural gas per day.

Despite the reduction in production from 2028, the expected production volume for 2030 will still be larger than Espírito Santo's offshore production in 2024. In that year, average production was 147.4 thousand barrels of oil per day and 3.5 million cubic meters of natural gas per day (m³/day).

The investments in the Espírito Santo Basin and in Espírito Santo's portion of the Campos Basin, driven by projects like Parque das Baleias, Wahoo and Golfinho, will maintain the growth of the offshore production between 2025 and 2027. The entry into operation of FPSO Maria Quitéria, the beginning of the production in the Wahoo field by PRIO, and the optimizations at the Golfinho field promoted by BW Energy guarantee a significant increase in the oil and natural gas offer in short term. However, from 2027 onwards, a production decrease trend is observed, reflecting the fields' maturity and the absence, so far, of new investment projects capable of compensating the estimated production reduction.

Chart 21 - **Projection of the offshore oil production in Espírito Santo (thousand bbl/day)**



Source and elaboration: Observatório Findes and LCA.

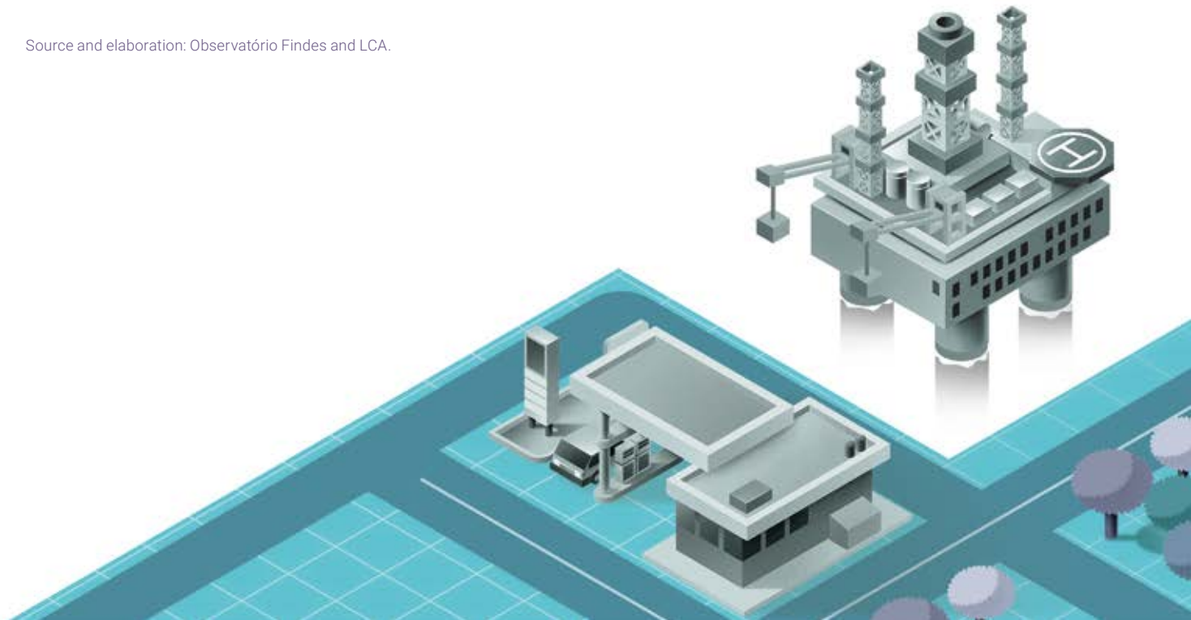
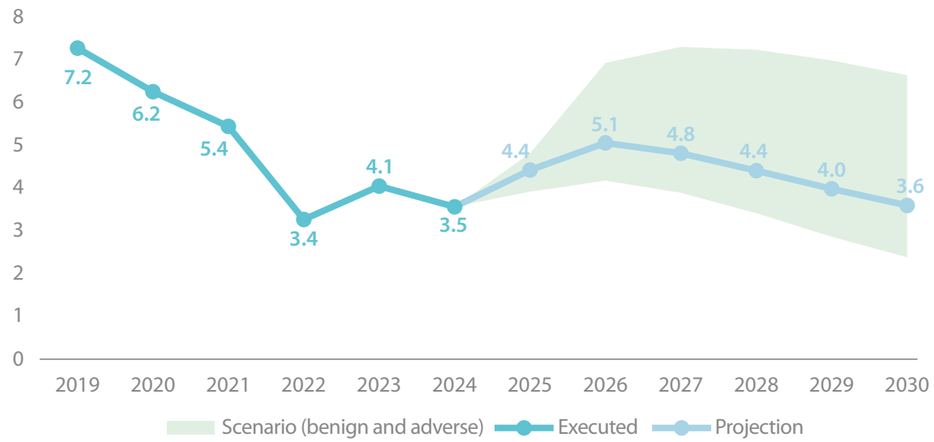


Chart 22 - **Projection of the offshore natural gas production in Espírito Santo (millions of m³/day)**



Source and elaboration: Observatório Findes and LCA.

4.9%

is the average annual increase expected for the onshore oil production between 2024 and 2027 in Espírito Santo

-0.9%

is the average annual decline expected for the onshore natural gas production between 2024 and 2027 in Espírito Santo

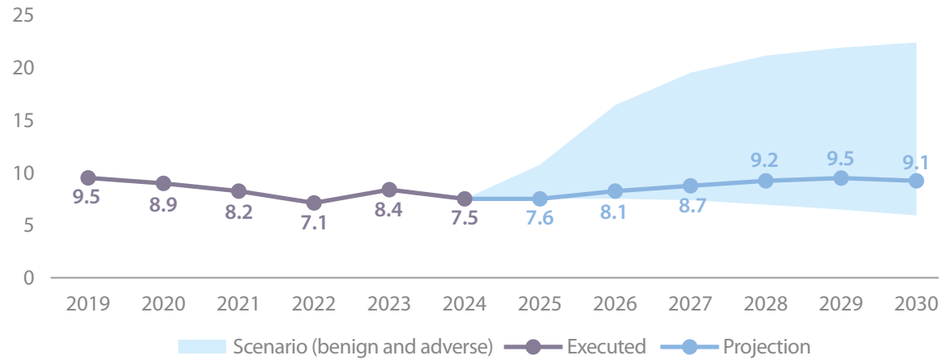
PROJECTION OF THE ONSHORE PRODUCTION IN ESPÍRITO SANTO

Onshore production represents a minority share of Espírito Santo's total oil and natural gas production. Even so, this activity is of utmost importance to the regional socioeconomic development of the municipalities involved, especially in terms of generating jobs and income.

The expected increase in onshore oil and natural gas production between 2024 and 2030 differs from the trend expected for the offshore environment. For onshore oil and gas, a volume growth is expected until 2029 and, in 2030, a production decrease is expected for both resources. In that year, there are no projections of new volume increments to both productions.

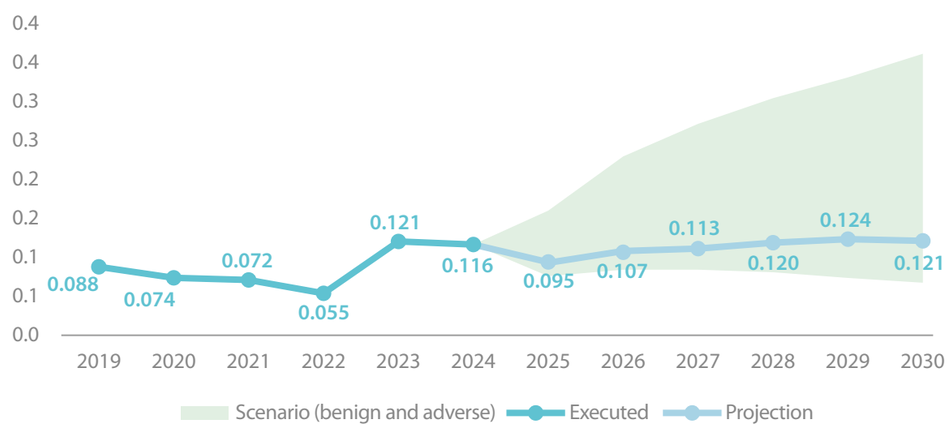
An average annual growth of 4.7% is projected for oil production and 1.3% for natural gas production in Espírito Santo's onshore environment between 2025 and 2029. For 2029, oil production must reach 9.5 thousand barrels per day and natural gas production must reach 123.8 thousand cubic meters per day. However, it is expected that, from 2029 to 2030, oil and natural gas production will record a decrease of 3.5% and 2.2%, respectively. Nonetheless, the volume produced in 2030 is expected to be larger than the one observed in 2024, when the average oil production was 7.5 thousand barrels per day and the average natural gas production was 116.3 thousand cubic meters per day.

Chart 23 - **Projection of the onshore oil production in Espírito Santo (thousand bbl/day)**

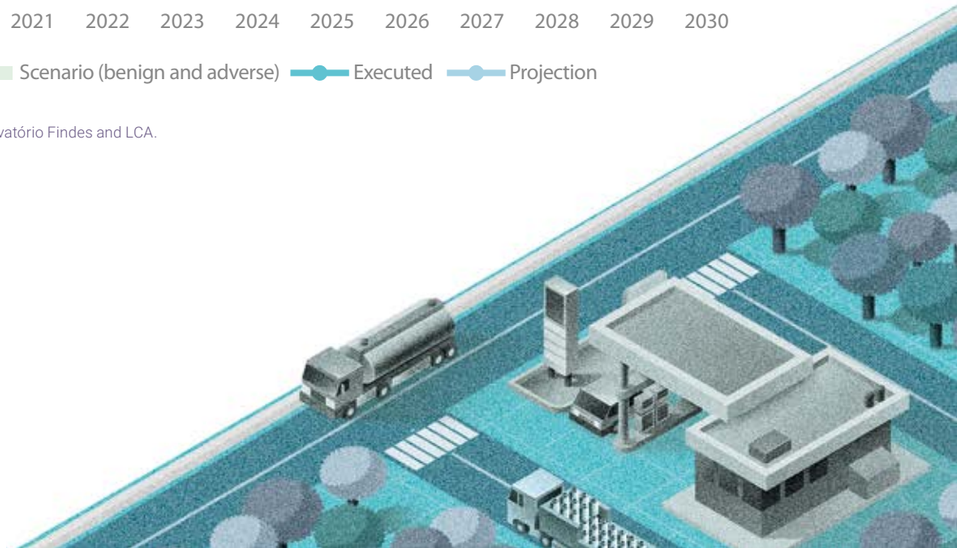


Source and elaboration: Observatório Findes and LCA.

Chart 24 - **Projection of the onshore natural gas production in Espírito Santo (millions of m³/day)**



Source and elaboration: Observatório Findes and LCA.



Guilherme Sargenti

General Manager of the Petrobras' Espírito Santo Business Unit

PETROBRAS IN ESPÍRITO SANTO: INVESTMENTS, STRATEGIES AND COMMITMENT TO THE SOCIETY

Petrobras' work in Espírito Santo has been marked by continuous evolution, combining technological breakthroughs and socioenvironmental commitments. In the last few years, the company has concentrated investments in assets with greater economic returns and lower extraction costs. This strategy has kept the state a relevant hub for oil and natural gas exploration and production.

We will invest approximately BRL 35 billion in projects in Espírito Santo from 2025 to 2029. This investment will establish the pillars for the future of Petrobras' operations in the state. Throughout this period, for instance, 76 new wells will be interconnected, which means a significant increase in the number of wells managed by the Unit.

In 2027, we will have developed activities in the state for 70 years, with a higher level of production than the current one, preserving the state's role as the third largest producer of oil and gas in the country, and strengthening our position in Espírito Santo and with its people.

The work of our Unit in Espírito Santo extends far beyond the state's borders. Approximately ten thousand people work directly with us in our activities and are in charge of our oil and gas production in Espírito Santo and in some fields in the northern seacoast of Rio de Janeiro.

As a result of these efforts, in 2024, we invested more than BRL 2.3 billion alongside 550 companies contracted in the state, and we have signed more than BRL 5.2 billion in new contracts with companies in Espírito Santo. This shows the importance of the local market of suppliers to Petrobras.

A pillar of the future of Petrobras' operations in Espírito Santo is the optimization of mature fields and the revitalization of areas with ongoing production. The use of advanced recovery techniques and the application of real-time digital monitoring tools allow us to enhance the efficiency of wells and prolong the service life of our assets. In this context, the company invests in solutions which include data analysis and artificial intelligence to identify operational points of improvement, reduction of costs and accidents, and increments to the oil recovery factor.

Another aspect that has become increasingly relevant is the monetization of natural gas. Espírito Santo has a strategic position in Brazil's gas supply network, and Petrobras has performed improvements to the processing, transportation and commercialization infrastructure of this resource. With the consolidation of supply routes and the optimization of compression plants, the aim is not only to reduce flaring, but to expand gas supply to the local industry, contributing to the diversification of the energy matrix and strengthening the state's production.

The just energy transition is another key point of our corporate strategy. Although our focus remains the exploration of offshore reserves with higher profitability, there is a growing interest in carbon reduction projects, such as CO_2 capture and storage (CCUS), generation of energy from renewable sources and the electrification of processes. Such initiatives are coherent with the global decarbonization goals and reiterate Petrobras' concern with developing cleaner and more sustainable operations, which goes beyond the simple fulfillment of regulatory requirements.

In the socioeconomic aspect, Petrobras maintains its commitment to the regional development and community engagement with the purpose of fostering Espírito Santo's local content and strengthening the state's supply chain. Professional qualification programs and partnerships with teaching and research institutions contribute to the qualification of specialized workforce, in line with the industry's new challenges.

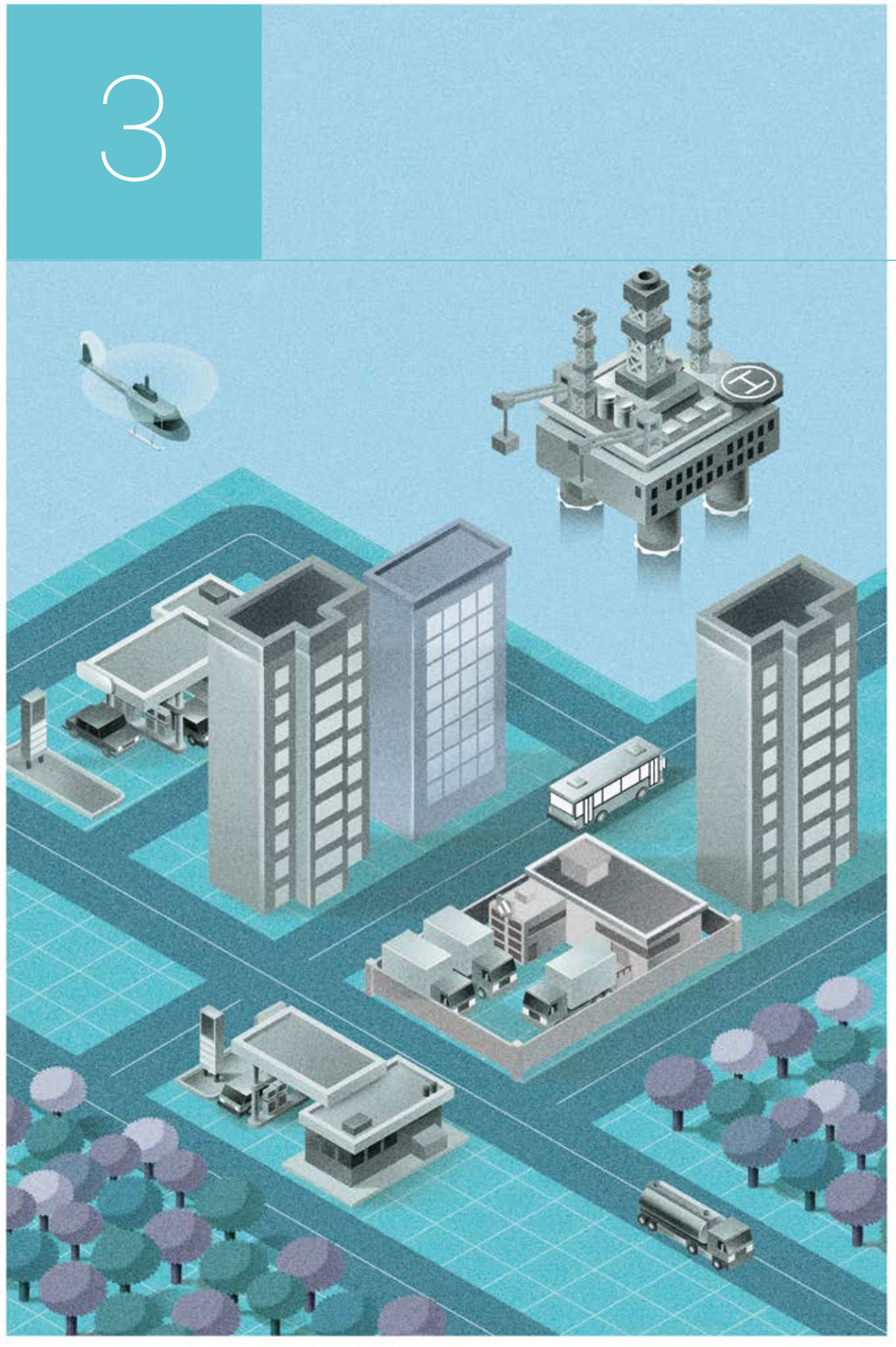
Additionally, the company continues to work on social projects that reach thousands of people in municipalities from the North to the South of the state. Cultural projects that expand people's access to arts and culture, and environmental projects that protect and restore our biodiversity. An example of the latter is the Baleia Jubarte project, of which we are the only sponsors, that managed to revert the decline of this species while creating income opportunities, especially in responsible tourism.

The future we are creating together in Espírito Santo is both promising and challenging. On the one hand, competitiveness in deep water fields and the growing demand for natural gas reinforce the state's attractiveness for new investments. On the other hand, the search for low carbon solutions, the use of digital processes and the need for engagement with local communities impose a higher degree of responsibility and innovation.

The convergence of these elements makes Espírito Santo a strategic territory for Petrobras, as the company repositions itself to deliver sustainable, high-value outcomes, contributing to the development of the state's economy and strengthening its role in the national energy market.

Petrobras maintains its commitment to regional development and community engagement seeking to promote local content and strengthen the chain of suppliers in Espírito Santo

3



ECONOMIC REFLECTIONS

COMPANIES AND JOBS IN OIL AND NATURAL GAS PRODUCTION

Oil and natural gas (O&G)[5] production represents one of the most important economic pillars and plays a significant role, both nationally and in Espírito Santo. Characterized by high technological demand and its formal and qualified occupations, this industry generates significant impacts in the regions where it operates, being a driver of socioeconomic development (RODRIGUES, 2018).

Oil and natural gas exploration and production stimulate an extensive chain of specialized goods and services, such as: drilling equipment, monitoring and control technologies, specialized transportation, and consultancies in engineering and geology. Such complexity not only strengthens the sector, but also contributes to the growth and diversification of the job market, creating direct and indirect jobs in several areas. **In 2023, Espírito Santo registered 612 formal companies in oil and natural gas production (0.6% of all companies in the state). During the same year, the same economic activities corresponded to 28,376 companies in the country. Therefore, the state had a 2.2% participation in the total of companies connected to these segments.**

Among the segments which are part of oil and natural gas production, the Supplier Companies hold the highest share, representing 81.9% of all companies in the state, followed by the companies in the segments of Supply Chain (9.6%), Exploration and Production (6.4%), Petrochemicals (1.1%) and Oil Products (1.0%).

In 2023, Espírito Santo's oil and natural gas production grew 8.3% in comparison to the previous year[6], with highlights to the segment of Supplier Companies, with 33 new enterprises, or a 7.0% increase.

Production was distributed among 56 municipalities in Espírito Santo, with highlights

612

companies belonged to the oil and natural gas production chain in Espírito Santo in 2023

5. In this Yearbook, Espírito Santo's oil and gas production was divided into five segments: (i) Exploration and Production (E&P), also known as upstream, composed by oil and natural gas extraction activities and supporting services; (ii) Oil Products, which encompasses activities related to oil and natural gas processing; (iii) Supply, which includes transformation processes and O&G product commercialization; (iv) Petrochemicals, branch of the chemical industry that uses oil and natural gas as resources; and (v) Supply Chain, which gathers industrial activities involved in the offer of specific goods and services to E&P.

6. Data analysis of jobs and companies is limited to the 2022-2023 timeframe, due to a break in RAIS' historical series, occurred after the change in the information collection method with the implementation of eSocial.

to Serra, with 21.2% of all enterprises that belong to this chain in the state, followed by Vitória (15.0%) and Aracruz (10.6%).

In 2023, Espírito Santo's oil and natural gas industry employed 15,008 workers, 1.4% of all jobs in the state. Nationally, these activities were responsible for 503,897 formal jobs, being oil and natural gas responsible for 3.0% of these workers.

Table 2 - **Evolution of the oil and natural gas companies in Espírito Santo (2022 and 2023)**

Segments	2022	Participation (%)	2023	Participation (%)
E&P	37	6.5	39	6.4
Oil products	4	0.7	6	1.0
Petrochemicals	6	1.1	7	1.1
Supply Chain	50	8.8	59	9.6
Supplier Companies	468	82.8	501	81.9
Total	**565**	**100.00**	**612**	**100.0**

Source: Ministry of Economy / RAIS (2024) | Elaboration: Observatório Findes.

15,008

formal jobs in the oil and gas production chain in Espírito Santo in 2023

Of all jobs created in the state, 66.8% were linked to Supplier Companies, while 24.1% were in Exploration and Production (E&P). Together, these segments accounted for 90.8% of the payroll jobs generated by Espírito Santo's oil and natural gas industry in 2023. Supply Chain was responsible for 6.4% of the payroll jobs, followed by Oil Products (1.7%) and Petrochemicals (1.1%).

In comparison to 2022, the number of formal positions in Espírito Santo's oil and natural gas production grew by 34.1% in 2023, with a 275% increase in the segment of Oil Products, which represented the creation of 187 new payroll jobs.

The Exploration and Production (E&P) segment also stood out, from 1,723 jobs in 2022 to 3,610 in 2023, which represented a 109.5% increase with 1,887 new positions created. Such performance is the result of companies' diversification in Espírito Santo's O&G sector, driven by Petrobras' divestment plan and the simplification in the asset acquisition process, represented by ANP's Permanent Offer. This development not only expanded the segment's participation in production, – from 15.3% in 2022 to 24.05% in 2023 – but also underlined its relevance as one of the main segments in Espírito Santo's oil and gas production.

In 2023, the job market of Espírito Santo's oil and natural gas production experienced a significant and comprehensive expansion. During this period, all segments displayed an increase in the number of employees hired.

Regarding the profile of employees hired by Espirito Santo's oil and natural gas production, in 2023, women occupied 16.5% of the formal positions created by this industry. Despite this advancement, men are still the majority, with 83.5% of all payroll jobs in this sector. Espírito Santo's job market representation according to gender is similar to national figures, where women still represent only 18.7% of the oil and gas production workforce. Notably, in 2023, 2.6% of all women employed in this sector nationally worked in Espírito Santo.

In 2023, most of the workers in Espírito Santo's oil and natural gas production belonged to the 30 to 49 years old age group, with 8,947 payroll jobs (59.6% of the total). This is a similar profile to the one observed nationally, in which 59.1% of the workers were also in this age group. The group ranging from 18 to 29 years old represented 3,677 jobs (24.5%). Such age distribution reflects the industry's specificities, which usually demand professionals with greater experience. Among the youngest workers, the age group between 10 and 17 years old represented 1.5% of the jobs in this industry, whereas professionals who are 65 years old or older represented 0.7% of the total. Lastly, workers between 50 and 64 years old represented 13.2% of the employees in oil and natural gas production.

57.9%

of the workers with higher education

20.4%

of the workers concluded High School

Table 3 - **Evolution of jobs in oil and natural gas production in Espírito Santo (2022 and 2023)**

Segments	2022	Participation (%)	2023	Participation (%)
E&P	1,723	15.39	3,610	24.05
Oil products	68	0.61	255	1.70
Petrochemicals	165	1.47	173	1.15
Supply Chain	784	7.00	954	6.36
Supplier Companies	8,454	75.52	10,016	66.74
Total	**11,194**	**100.00**	**15,008**	**100.0**

Source: Ministry of Economy / RAIS (2024) | Elaboration: Observatório Findes.

Regarding the school level of professionals employed in oil and natural gas production, in 2023, 57.9% of the workers had concluded High School, while 20.4% had a Higher Education degree, which reflects a scenario of qualified workforce. Professionals who only concluded Elementary and Middle School represented 5.2% of all workers.

Additionally, in comparison to the national oil and natural gas production sector, Espírito Santo employed 4.5% of the workers with Master's degrees and 2.7% of the workers who concluded Doctorate programs. The state stands out for its high specialization levels, outperforming the general profile of workers in Espírito Santo's other economic sectors, in which only 0.9% have a Master's degree and 0.3% have a Doctor's degree.

Table 4 - **Characteristics of the oil and natural gas production's job market in Espírito Santo - 2023**

AGE GROUP	ES	BR	ES/BR
10 to 14	2	34	5.9%
15 to 17	226	2,257	10.0%
18 to 24	1,797	52,519	3.4%
25 to 29	1,880	61,026	3.1%
30 to 39	4,784	157,283	3.0%
40 to 49	4,163	140,305	3.0%
50 to 64	2,042	81,684	2.5%
65 and older	109	8,547	1.3%
SCHOOL LEVEL	**ES**	**BR**	**ES/BR**
Illiterate	19	1,056	1.8%
Until Grade 5 (Pre-School)	104	5,647	1.8%
Concluded Grade 5 (Elementary School)	93	5,062	1.8%
Grades 6 to 9 (Middle School)	404	14,305	2.8%
Concluded Elementary and Middle School	787	30,042	2.6%
Did not conclude High School	1,143	23,300	4.9%
Concluded High School	8,682	278,043	3.1%
Did not conclude Higher Education	437	24,636	1.8%
Concluded Higher Education	3,056	115,076	2.7%
Master's Degree	256	5,745	4.5%
Doctor's Degree	27	985	2.7%

Source: Ministry of Economy / RAIS (2024) | Elaboration: Observatório Findes.

The positions of welder (859 employees, or 5.7%), administrative assistant (602 employees, or 4.0%) and oil exploration operator (412 employees, or 2.7%) employed most workers in Espírito Santo's oil and natural gas production in 2023. Regarding the national sector, the state stood out for employing 19.1% of all the sector's machine operators in the country.

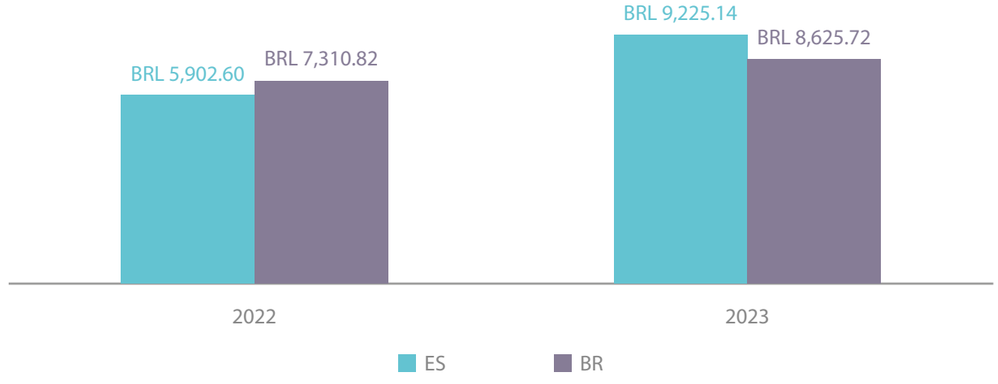
Regarding remuneration, the professionals in each segment of Espírito Santo's oil and natural gas production were paid, in 2023, an average salary of BRL 9,225.14, while the national average was BRL 8,625.72. The difference observed reflects how the state values its workforce, as well as the complexity and level of specialization of the activities carried out in this industry. The higher average salary may be explained by the presence of high value added activities, such as exploration and production, which demand professionals with higher qualifications and longer experience.

Table 5 - **Occupations that employed most workers in oil and natural gas production in Espírito Santo - 2023**

MAIN OCCUPATIONS	ES	BR	ES/BR %
Welders	859	19,249	4.5%
Administrative assistants	602	19,439	3.1%
Oil exploration operators	412	8,142	5.1%
Truck drivers (regional and international routes)	407	16,479	2.5%
Office assistants, in general	387	13,474	2.9%
Machine maintenance mechanics, in general	384	8,571	4.5%
Assemblers of metallic structures	360	10,683	3.4%
Production line feeders	340	18,556	1.8%
Occupational safety technicians	312	7,866	4.0%
Machine operators	299	1,567	19.1%

Fonte: Ministério do Trabalho e Emprego / RAIS (2024) | Elaboração: Observatório Findes.

Chart 25 - **Evolution of the real average salary of the oil and natural gas production in Espírito Santo and Brazil – (2022 and 2023)**



Source: Ministry of Economy / RAIS (2024) | Elaboration: Observatório Findes.

BRL 9.2 thousand

was the average salary of the oil and gas production chain in Espírito Santo in 2023

It is worth noting that, in 2022, the average salary paid in Espírito Santo's oil and natural gas production (BRL 5,902.60) was below the national average (BRL 7,310.82). However, in 2023, with a real growth of 56.3%, this sector's average salary in Espírito Santo (BRL 9,225.14) surpassed the country average (BRL 8,625.72). This increase was driven by job market growth and the increasing number of companies in the state's oil and gas production.

GOVERNMENT TAKES

Government Take fees are financial compensations paid to the federal government and redistributed to the states and municipalities by the oil and gas sector, for its use of finite natural resources. These compensations also include: royalties, special participation, signature bonus and payment for land use or retention.

Among government take fees, only royalties and special participation fees are shared among state and municipal governments. Royalties are a type of financial compensation calculated based on a contractual tax rate which may vary between 5% and 15% of each well's revenue. As for Special Participation (PE, in Portuguese), these fees are paid by companies that explore high productivity fields and are calculated through progressive tax fees applied to the net revenue of each field's quarterly production.

BRL 2.6 billion

in Government Take fees paid to Espírito Santo in 2024

The Brazilian oil and natural gas industry paid BRL 98.04 billion in government take fees[7] in 2024, which represents a 1.2%[8] increase in comparison to figures from 2023. Regarding the composition of these payments, 59.4% were royalties and 40.6% were special participation fees, amounts shared among the federal, state and municipal governments.

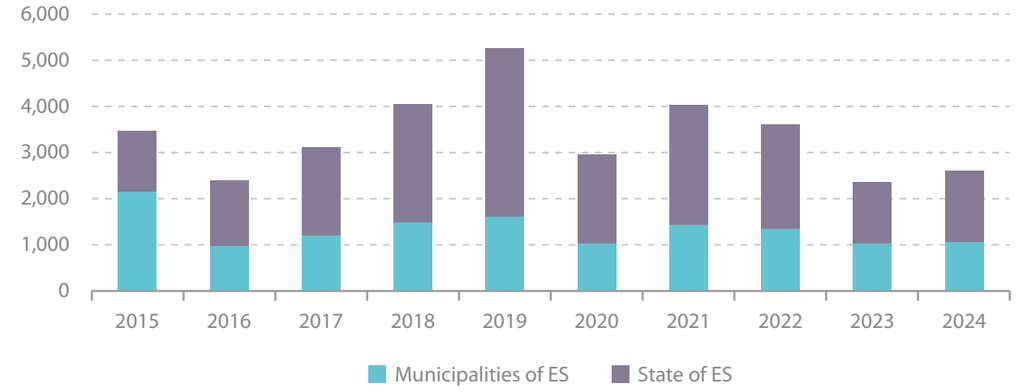
In Espírito Santo, total government take fees reached BRL 2.6 billion in 2024, a 10.4% increase in relation to the amount registered in the previous year. From this total, BRL 1.57 billion correspond to royalties and BRL 1.03 billion are special participation fees, which represent increases of 3.7% and 22.4%, respectively, in comparison to 2023. The state of Espírito Santo had the third-highest government revenue share among Brazilian states, trailing only Rio de Janeiro (R$ 43.6 billion) and São Paulo (R$ 3.8 billion).

Government take fees paid to the state of Espírito Santo added up to BRL 1.53 billion in 2024 (14.2% increase in relation to 2023) and those paid to the municipalities totaled BRL 1.08 billion (5.5% growth when compared to the previous year).

The growth in government take revenue in 2024 occurred even despite a decline in international oil prices and a reduction in the state's oil and natural gas production. Throughout that year, Espírito Santo recorded an 8.5% reduction in oil production

and a 12.8% reduction in natural gas production. Regarding international oil prices, there was a 3.0% reduction in the Brent price (with an average price of USD 74.6 in 2024) and 2.9% in the WTI price (with an average price of USD 71.7 in 2024).

Chart 26 - **Revenue from government take fees (royalties and PE) in Espírito Santo (BRL million)**



Note: Constant values – IPCA accum. Jan-Dec 2024

Source: ANP | Elaboration: Observatório Findes.

Two main factors explain the increase in government take payments, even against a backdrop of falling production and international oil prices. The first factor was the appreciation of the dollar, which directly impacted the calculation of the reference price of hydrocarbons, defined by ANP. In 2024, the annual average exchange rate registered a 7.9% growth in comparison to 2023, from BRL 5.00 to BRL 5.39 per dollar.

The second and main factor was the Jubarte Field's TBP Agreement signed by Petrobras and ANP in January 2024, which concluded the legal dispute related to the collection of government take fees (royalties and special participation) for the Jubarte Field. According to ANP, between August 2009 and February 2011, such participation fees ceased to be collected due to the company's lack of updates on the True Boiling Points (TBP)[9] found in this field's oil current. This issue impacted on the calculation of the reference price for oil, based on which royalties and special participation fees are charged.

7. This total does not include amounts paid as signature bonuses nor payments for occupation or retention of area.

8. Variation already adjusted for inflation.

9. The TBP (True Boiling Point) curve is a chart that represents the relation between boiling temperature and oil volume or mass yield. According to ANP, the reference price of oil for a certain field, for purposes of collection of government take fees, is calculated considering the physical-chemical characteristics of the oil current to which this field is connected. The True Boiling Points, known as the TBP curve are analyzed for each one of these currents. This curve determines the light, medium and heavy fractions in each oil type. After this analysis, the oil found in the current is valued based on the prices of oil products in the international market.

Two main factors explain the increase in Government Take fees in 2024

1. Appreciation of the dollar

2. Signature of the TBP Agreement in the Jubarte Field

The amount to be paid by Petrobras was agreed in BRL 832.4 million. The initial payment corresponded to 35% of this amount (BRL 181 million in adjusted values) and the remaining sum was to be paid in 48 installments, with adjustments according to the Selic tax. Until the end of 2024, eight installments had already been paid, contributing to the increase in government take collection in Espírito Santo during that year.

Table 6 - **Revenue from government takes (royalties and PE) in Espírito Santo (BRL million)**

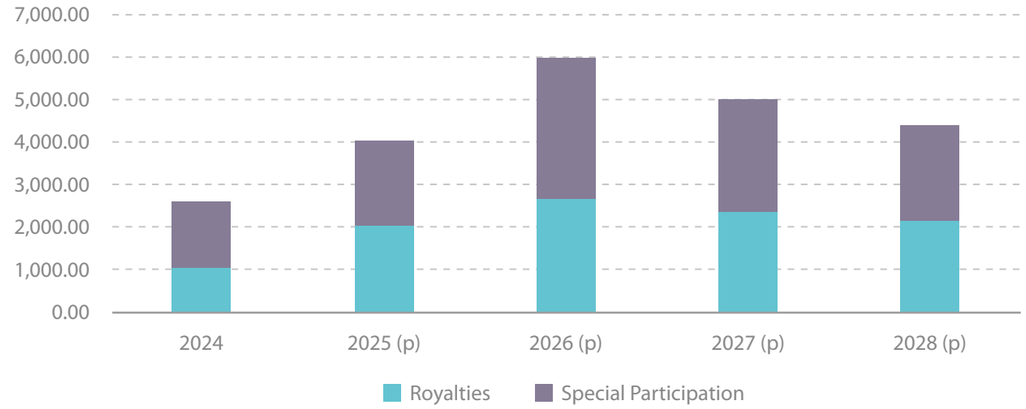
		2017	2018	2019	2020	2021	2022	2023	2024
Total Government Takes	Municipalities of ES	1,184.8	1,477.7	16,000.6	1,016.8	1,433.1	1,335.7	1,023.9	1,080.2
	State of ES	1,933.3	2,562.4	3,667.5	1,941.1	2,614.0	2,273.9	1,344.4	1,534.9
	Total Brazil	44,010.7	73,791.3	74,672.7	59,642.8	89,897.5	129,349.4	96,847.0	98,041.6
	% of Brasil	7.1	5.5	7.1	5.0	4.5	2.8	2.4	2.7
Royalties	Municipalities of ES	924.7	1,100.8	922.5	698.5	1,000.3	973.6	854.2	872.5
	State of ES	892.9	1,055.1	954.9	667.8	882.8	825.7	665.4	703.9
	Total Brazil	22,102.5	32,545.0	31,304.8	29,139.1	43,877.5	64,847.3	56,239.2	58,222.7
	% of Brasil	8.2	6.6	6.0	4.7	4.3	2.8	2.7	2.7
Special Participation	Municipalities of ES	260.1	376.8	678.2	318.3	432.8	362.1	169.8	207.7
	State of ES	1,040.4	1,507.4	2,712.6	1,273.2	1,731.2	1,448.2	679.1	831.0
	Total Brazil	21,908.2	41,246.2	43,403.0	30,503.7	46,020.0	64,502.0	40,607.8	39,818.9
	% of Brazil	5.9	4.6	7.8	5.2	4.7	2.8	2.1	2.6

Note: Constant values – IPCA accum. Jan-Dec 2024.

Source: ANP | Elaboration: Observatório Findes.

According to ANP projections, between 2025 and 2027, governmental revenues derived from oil and gas production within Espírito Santo's areas of influence are expected to register an average annual growth of 7.3%, reaching a total of BRL 4.9 billion in 2027 (Chart 22). From this total, BRL 2.3 billion are estimated to be paid in royalties and BRL 2.6 billion in special participation fees. In 2028, due to the natural decline of Espírito Santo's oil and natural gas production (see Section 2.3), a reduction to BRL 4.3 billion in government take fees is projected, with BRL 2.1 billion in royalties and BRL 2.2 billion in special participation fees.

Chart 27 - **Projection of government take revenues (royalties and PE) in Espírito Santo (BRL million)**



Note: (p) corresponds to the values estimated by ANP.

Source: ANP | Elaboration: Observatório Findes.

FOREIGN TRADE

In 2024, the global oil market remained relatively stable despite geopolitical tensions and uncertainties related to the sanctions imposed to Russia and to Iran's energy policy[10], which represented risks to the global supply of this resource. Such stability was sustained by the offer expansion in non-OPEC+[11] countries, with highlights to the United States, Brazil, Guiana, Canada, and Argentina. In terms of global demand, rates were below expectations, especially due to the deacceleration of the Chinese economy[12]. As a result, the Brent price was, in average, USD 74.6 by the end of the year, whereas the WTI price registered an average of USD 71.7 – reductions of 3.0% and 2.9%, respectively, in comparison to 2023.

In this context, Brazil stood out with a record in oil exports, consolidating the product as the main item exported by the country in 2024. This growth was driven by the search for alternatives to the oil from Russia and the Middle East, in addition to the increase in national production derived from pre-salt activities, led by Petrobras.

USD 1.07 billion

were the total exports of the oil chain in Espírito Santo in 2024

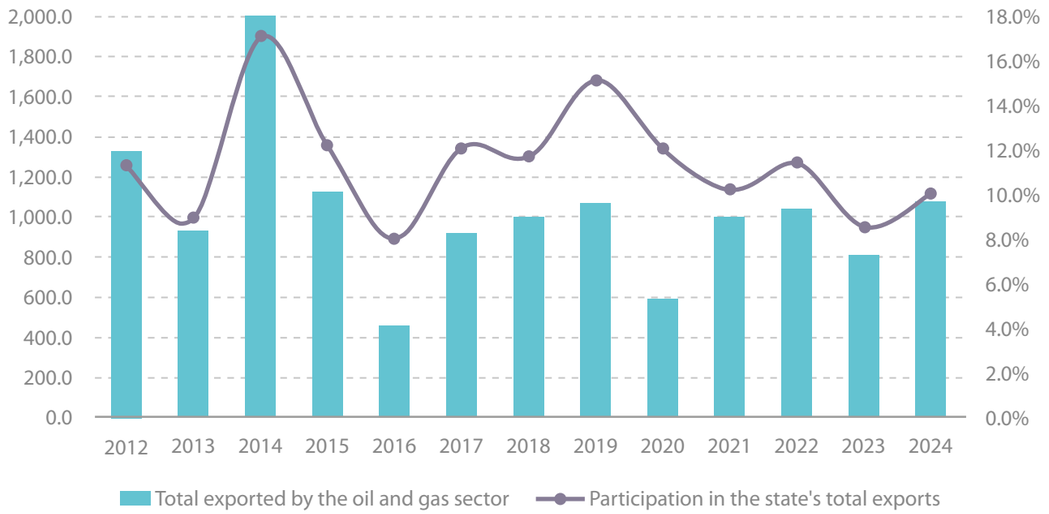
10. In 2024, Israel's offensive in the Gaza Strip hampered the oil and gas traffic in the Red Sea, incurring additional costs and impacting the global offer. Additionally, the consequences of the Russo-Ukrainian war continue causing volatility in prices and stimulating the search for new suppliers.

11. Organization of the Petroleum Exporting Countries and Allies.

12. In 2023, China's GDP grew by 5.4%, whereas the IMF estimated a more modest growth of 4.8% in 2024. For 2025, IMF projections indicate a continuous deacceleration, with growth estimated between 4% and 4.5%..

In Espírito Santo, the oil sector registered a 32.5% increase in value and 28.8% in volume in 2024, including crude oil, coke products, oil products and petrochemical products. The state exported USD 1.07 billion in total, exceeding the USD 810.3 million recorded in the previous year. This performance expanded the oil sector's participation in Espírito Santo's exports, from 8.6% in 2023 to 10.1% in 2024, an increase of 1.5 percentage point.

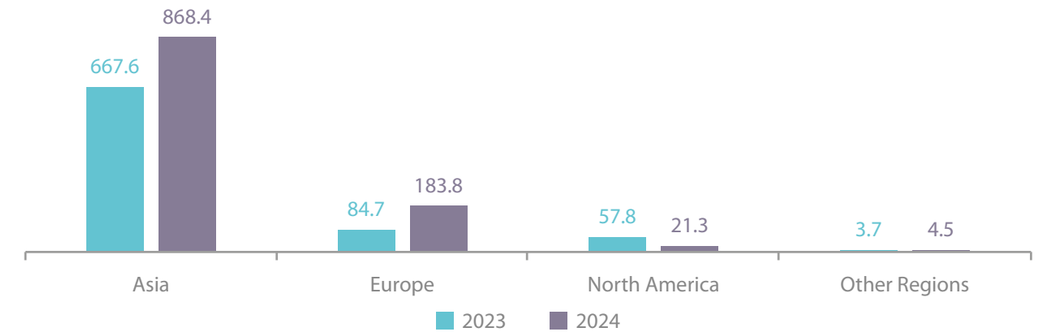
Chart 28 - **Oil exports in Espírito Santo (in USD million FOB) and the participation of oil exports in Espírito Santo's total exports (%)**



Source: Funcex | Elaboration: Observatório Findes

Regarding the destination of Espírito Santo's oil products exports, the Asian continent remained the main buyer of Espírito Santo's oil in 2024, representing 80.6% of all exports. The region registered a 30.1% increase in the amount exported in comparison to 2023, driven by the growing demand of countries like Malaysia and Singapore. Malaysia, which remains the state's strongest commercial partner, absorbed 57.7% of the exports, with a 6.5% growth in purchases. With highlights to Singapore, with a 341.2% increase in oil acquisitions and 55.4% in purchases of coke and oil products. This growth elevated Singapore's participation in Espírito Santo's oil products exports from 10.3% to 19.5% in 2024.

Chart 29 - **Main destinations of Espírito Santo's oil exports, in USD million FOB (2023 and 2024)**



Source: Funcex | Elaboration: Observatório Findes

In addition to Asia, Europe also expanded its purchases of Espírito Santo's oil products in 2024. Exports to the European continent grew by 117%, representing 17.1% of the total, with highlights to the Netherlands' and Portugal's acquisitions. Foreign sales to the Netherlands grew by 182.8%, enhancing their participation in Espírito Santo's exports to 10.4%, an increase of 3.3 percentage points. Similarly, Portugal, with no purchases in 2023, represented 6.6% of the exports in 2024. This movement may indicate a supplier diversification strategy by European countries, possibly in response to the changes in global oil trade flows in a scenario with recurring geopolitical tensions. On the other hand, exports to North America, which represented 2% of the total in 2024, registered a 63.1% decrease, reflecting the reduction of sales to the United States.

In relation to the distribution of Espírito Santo's oil exports, crude oil represented most of the foreign sales in 2024, totaling USD 971.8 million, which corresponds to 90.4% of total exports. This product registered a 32.0% growth in value, with the following main destinations: Malaysia (64.0%), Singapore (12.8%), the Netherlands (11.5%), and Portugal (7.4%). In volume, oil exports grew by 27.6%.

Coke and oil products accounted for 9.2% of the oil industry's exports. This segment recorded a 38.7% increase compared to 2023, totaling USD 103.7 million in 2024. The growth was driven primarily by purchases from Singapore and China. Sales to Singapore rose by 55.4%, reaching USD 86.5 million, while exports to China – which had not recorded any transactions in this segment in

30.1%

was the increasein exports to Asia of oil chain products from Espírito Santo

117.0%

was the increase in exports to Europe of oil chain products from Espírito Santo

18.2%

was the increase in imports of oil chain products from Espírito Santo between 2023 and 2024

USD 182.4 million

was the amount imported in oil chain products from Espírito Santo in 2024

the previous year – came to represent 14.6% of the segment's export portfolio, totaling USD 15.1 million last year.

The petrochemical industry, with a more modest share of 0.4% of the oil industry's exports, totaled USD 2.6 million in 2024 and was the only segment to record a decline in foreign sales (-18.3%) compared to 2023. This weaker performance reflected a slowdown in purchases by key markets, particularly Colombia, whose share dropped from 66.0% to 34.1% due to a 55.6% reduction in imports. Argentina, accounting for 19.4% of the segment, also experienced a 21.2% decline in purchases. On the other hand, South American partners Paraguay and Uruguay, which accounted for 16.7% and 15.5% of the segment respectively, increased their imports of petrochemical products from Espírito Santo, with year-on-year growth of 664.6% and 99.0%, respectively. This growth helped mitigate the overall contraction in the segment, serving as a positive counterbalance.

As for imports of oil industry products, Espírito Santo recorded an 18.2% increase in this category, totaling USD 182.4 million in 2024. This growth was driven mainly by a 31.7% increase in purchases of petrochemical products, which accounted for 82.6% of the state's total imports in the oil industry. The main countries of origin for these goods were: China (USD 44.7 million), Russia (USD 31.2 million), the United States (USD 27.4 million), and Italy (USD 21.8 million).

Table 7 - **Oil industry exports from Espírito Santo (in USD million)**

	Total Exports		Crude Oil and Natural Gas		Coke and Oil Products		Petrochemical Products	
	Total ES (USD million)	%ES/BR	Total ES (USD million)	%ES/BR	Total ES (USD million)	%ES/BR	Total ES (USD million)	%ES/BR
2010	900.9	3.6%	900.7	5.0%	0.0	0.0%	0.2	0.0%
2011	1,512.3	4.6%	1,512.0	6.3%	0.0	0.0%	0.3	0.0%
2012	1,322.8	4.1%	1,322.4	5.8%	0.0	0.0%	0.4	0.0%
2013	933.8	3.9%	931.7	6.2%	0.0	0.0%	2.0	0.0%
2014	2,006.4	7.5%	2,000.7	10.8%	0.0	0.0%	5.7	0.1%
2015	1,130.7	6.1%	1,128.7	8.1%	0.1	0.0%	1.9	0.1%
2016	466.7	2.9%	465.5	3.7%	0.0	0.0%	1.2	0.0%
2017	924.2	3.8%	920.1	4.8%	0.0	0.0%	4.2	0.1%
2018	1,004.2	2.9%	960.2	3.5%	38.5	0.9%	5.5	0.2%
2019	1,075.0	3.1%	1,014.8	3.9%	58.8	1.0%	1.3	0.0%
2020	599.0	2.1%	567.1	2.7%	30.4	0.6%	1.6	0.1%
2021	1,002.5	2.3%	989.8	3.0%	11.9	0.2%	0.8	0.0%
2022	1,042.5	1.7%	970.4	2.2%	70.8	0.5%	1.4	0.0%
2023	813.9	1.4%	736.1	1.7%	74.8	0.6%	3.0	0.1%
2024	1,078.1	1.8%	971.8	2.1%	103.7	0.9%	2.6	0.1%

Source: Funcex | Elaboration: Observatório Findes

Table 8 - **Oil industry imports in Espírito Santo (in USD million)**

	Total Imports		Crude Oil and Natural Gas		Coke and Oil Products		Petrochemical Products	
	Total ES (USD million)	%ES/BR	Total ES (USD million)	%ES/BR	Total ES (USD million)	%ES/BR	Total ES (USD million)	%ES/BR
2010	374.0	1.0%	101.8	0.6%	46.3	0.4%	225.9	2.5%
2011	419.5	0.8%	135.0	0.6%	17.1	0.1%	267.4	2.6%
2012	401.4	0.8%	128.8	0.6%	34.6	0.2%	237.9	2.2%
2013	281.5	0.5%	79.4	0.3%	37.8	0.2%	164.3	1.5%
2014	256.1	0.4%	49.4	0.2%	35.5	0.2%	171.2	1.5%
2015	271.1	0.8%	61.8	0.4%	67.0	0.7%	142.2	1.5%
2016	160.0	0.7%	39.5	0.5%	33.8	0.4%	86.6	1.1%
2017	174.9	0.6%	24.5	0.3%	81.1	0.6%	69.3	0.8%
2018	163.7	0.5%	51.4	0.5%	46.3	0.3%	66.0	0.6%
2019	165.2	0.5%	36.9	0.4%	51.6	0.4%	76.7	0.7%
2020	174.3	0.7%	33.7	0.5%	85.6	1.0%	54.9	0.6%
2021	136.2	0.3%	19.3	0.1%	30.4	0.2%	86.6	0.7%
2022	130.5	0.2%	16.6	0.1%	22.5	0.1%	91.3	0.5%
2023	154.4	0.3%	21.9	0.1%	40.0	0.2%	92.6	0.7%
2024	182.5	0.4%	24.7	0.1%	31.7	0.2%	126.1	0.9%

Source: Funcex | Elaboration: Observatório Findes

RESEARCH, DEVELOPMENT, AND INNOVATION (R&D CLAUSE – ANP)

BRL 172.3 million

were the total resources generated by the fields in ES in 2024 through the R&D clause

The R&D Clause, established in 1998 under the Petroleum Law (Law No. 9,478/97) and most recently regulated by ANP Resolution No. 918 of 2023[13], mandates the allocation of a percentage of the gross revenue from high-productivity fields (Box 1) to research, development, and innovation (R&D) projects. The objective is to ensure that the development of the oil and natural gas industry contributes to scientific, technological, and environmental advancement, while also strengthening the country's competitiveness.

Since 2001, when Espírito Santo began operating high-productivity fields in the production phase, oil companies established in the state have been generating funds through the R&D clause. During this period, the state accumulated R&D obligations totaling BRL 2.5 billion, accounting for 7.4% of the total collected in Brazil. In 2024, Espírito Santo contributed BRL 172.3 million, representing 4.1% of the national total. This amount originated exclusively from the Jubarte Field, located in the Parque das Baleias, off the southern coast of the state.

13. The application of funds under the R&D clauses was initially regulated by ANP Resolution No. 33/2005 and Technical Regulation No. 5/2005, later replaced by ANP Resolution No. 50/2015 and Technical Regulation No. 3/2015. On September 3, 2019, ANP Technical Regulation No. 3/2015 was updated through ANP Resolution No. 799/2019. In 2023, this regulation was repealed and replaced by ANP Resolution No. 918/2023.

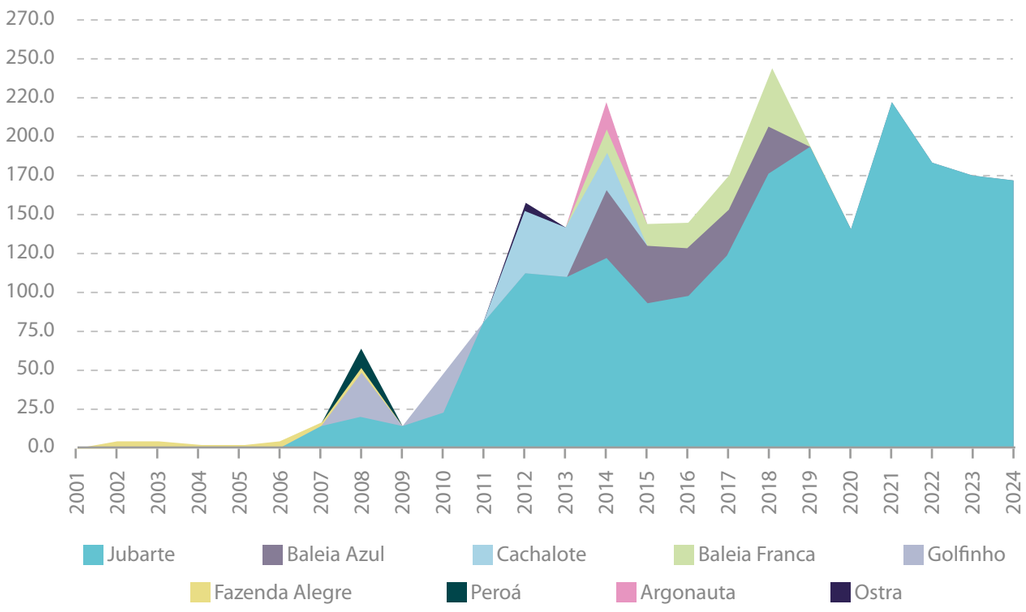
Box 1 - **Percentage of gross revenue allocated to R&D by concessionaires, by contractual regime of production fields**

		R&D Obligations by Concessionaires
Contractual Regime	Concession	1.0% of the monthly gross revenue from each field subject to special participation (high productivity)
	Production Sharing	1.0% of the annual gross revenue from each field
	Onerous Transfer	0.5% of the annual gross revenue from each field

Note: For more information, visit: https://www.gov.br/anp/pt-br/assuntos/tecnologia-meio-ambiente/pesquisa-desenvolvimento-inovacao/investimentos-em-pd-i

Source: ANP | Elaboration: Observatório Findes

Chart 30 - **R&D clause obligations in Espírito Santo, by field (2001–2024)**



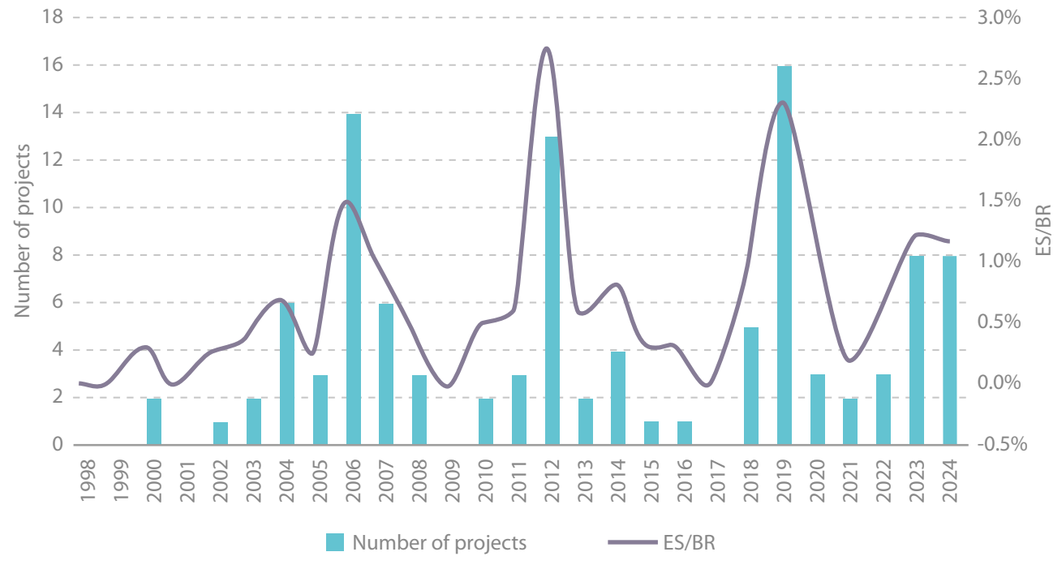
Fonte: ANP | Elaboração: Observatório Findes

The Jubarte Field has established itself as the main source of R&D obligations in the state, accounting for 79.7% of the total collected between 2001 and 2024, with a cumulative contribution of approximately BRL 2.0 billion. Since 2019, it has become the sole source of obligations in Espírito Santo (Chart 32).

Although these obligations originate from fields adjacent to the Espírito Santo's territory, the funds generated are not necessarily allocated to local projects, as they are distributed across the entire country. These resources are collected by the Federal Government, and it is ANP's responsibility to analyze, approve, monitor, and oversee their use, as stipulated in the R&D clause. Funds may be used in projects carried out by the oil company itself, by other national companies, or by accredited institutions, which broadens the opportunities for innovation and collaboration across various fields.

As a result of this model, a total of 13,715 projects have been launched in Brazil since 1998, of which 108 were implemented in Espírito Santo. In 2024, the state accounted for 1.2% of all projects in the country, with eight new initiatives launched. Total investment in these projects reached BRL 28.2 million, with Petrobras as the sole entity responsible for the allocation of resources.

Chart 31 - **Projects initiated with R&D clause funding in Espírito Santo (number of projects)**



Source: ANP | Elaboration: Observatório Findes

The projects implemented in Espírito Santo in 2024 covered a wide range of topics, including monitoring technologies and efficiency in oil exploration and production, as well as sustainability initiatives aligned with the latest industry trends. The Federal University of Espírito Santo (UFES) was the only institution involved, and the projects are being carried out in collaboration with various laboratories and research centers.

The Inference and Algorithms Center - NINFA at UFES launched the project Pattern Recognition of Defects in Electrical

The projects Implemented in Espírito Santo in 2024 encompassed several topics, such as monitoring technologies, exploration efficiency, and initiatives focused on sustainability, in line with the latest trends of the sector.

Submersible Pumping Systems (RPDBCS), focused on the development of interactions based on artificial intelligence (AI) and Large Language Models (LLMs). Funded by Petrobras, the project received an investment of BRL 7.4 million and aims to enhance interactive solutions between humans and software, with applications in the oil and gas industry.

The Telecommunications Laboratory at UFES is leading the project PROFETA-GO, which involves the development of Distributed Acoustic Sensing (DAS) sensors using high-scattering optical fibers for offshore geological applications. The project comprises two components: one focused on applied research, with BRL 6.4 million in funding, and another directed at laboratory infrastructure, which received BRL 3.4 million. Both investments come from Petrobras and aim to strengthen monitoring and analysis capabilities in offshore environments.

The Thermosciences Center for the Oil Industry at UFES initiated two noteworthy projects. The first investigates carbonate scaling mechanisms in the presence of oil in pressurized systems, with funding of BRL 4 million. The second focuses on modeling and simulating inorganic scaling in Autonomous Inflow Control Devices (AICDs) under typical oil well conditions, with an investment of BRL 1.1 million. Both projects are supported by Petrobras and aim to enhance extraction efficiency.

The Petroleum Research Laboratory - LabPetro at UFES received funding to develop a pilot system for the treatment and disposal of liquid waste from well drilling operations. With BRL 2.7 million in funding from Petrobras, the project seeks innovative solutions for the sustainable management of such waste.

At the Tectonics and Sedimentation Studies Center at UFES, a project led by Repsol, with an investment of BRL 1.6 million, focuses on the numerical and experimental analysis of the geomechanical effects of plume migration during CO_2 storage in geological formations. The research contributes to the development of safer and more effective carbon capture and storage (CCS) strategies.

Finally, the Oil and Gas Flow and Measurement Studies Center - NEMOG at UFES also received funding from Petrobras to conduct a study aimed at improving the reliability and operational range of flare gas flow measurement. With an investment of BRL 1.3 million from Petrobras, the project seeks to improve measurement accuracy and optimize processes in the oil industry.

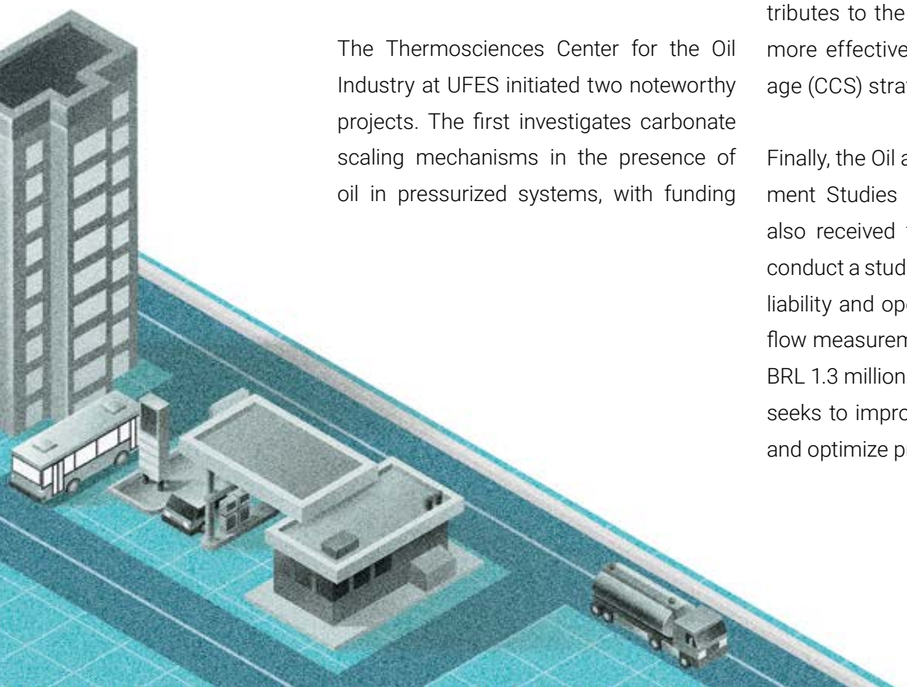


Table 9 - **Description of projects with resources from the R&D clause in Espírito Santo – 2024**

Project title	Responsible company	Project type	Implementing institutions – Research unit	Clause amount (BRL million)
RPDBCS: AI-based interaction	Petrobras	Applied research	UFES – Inference and Algorithms Center – NINFA	BRL 7.4
PROFETA-GO: DAS sensor project with high-scattering optical fibers for offshore geological applications.	Petrobras	Applied research	UFES – Telecommunications Laboratory	BRL 6.5
Studies on aspects of carbonate scaling in the presence of oil in pressurized systems	Petrobras	Experimental development	UFES – Thermosciences Center for the Oil Industry	BRL 4.0
Laboratory infrastructure of "PROFETA-GO: DAS sensor project with high-scattering optical fibers for offshore geological applications"	Petrobras	Infrastructure	UFES – Telecommunications Laboratory	BRL 3.4
Development of a pilot system for the treatment and disposal of liquid waste from well drilling	Petrobras	Environmental research	UFES - LabPetro	BRL 2.7
Numerical and experimental analysis of geomechanical effects resulting from CO_2 storage in geological formations – CO2GEOMEC project.	Repsol	Applied research	UFES – Center for Tectonics and Sedimentation Studies	BRL 1.7
Studies to increase reliability in flare gas flow measurement	Petrobras	Applied research	UFES – Center for Flow and Measurement Studies in Oil and Gas – NEMOG	BRL 1.4
Modeling and simulation of inorganic scaling in AICD valves under oil well conditions.	Petrobras	Applied research	UFES – Thermosciences Center for the Oil Industry	BRL 1.1
Total				**BRL 28.2**

Source: ANP | Elaboration: Observatório Findes

Marcelo Barbosa Saintive

Diretor-presidente do Bandes

ESPÍRITO SANTO'S SOVEREIGN FUND: A SUCCESSFUL PUBLIC POLICY INSTRUMENT

Over the last 12 years, the state of Espírito Santo has achieved national recognition for its excellence in fiscal and financial management. The indicator that enshrines this assessment is the National Treasury's analysis of the payment capacity of subnational entities. Over the last 13 years, the state has constantly achieved the highest score: Capag A.[1]

However, we know that good fiscal management does not end in itself. Concretely, caution in the administration of public finance gives rise to public and private investment opportunities.

In this context, the state of Espírito Santo creates the Sovereign Fund (Funses), by means of Complementary Law No.914, of June 17, 2019.[2] Funses' main sources of investments are revenues from the oil and natural gas' royalties and special participation fees.[3]

Funses is uniquely engineered to combine the classic role of earmarking resources for intergenerational savings and the mitigation of fiscal risks, with the purpose of promoting sustainable economic development.

In a nutshell, it is an institutional, disruptive innovation in the use of national revenues from royalties and special participation fees. With clear rules and with a well-defined governance structure (the aforementioned Complementary Law, regulatory decree and management committee),[4] this legal framework has established the appropriate conditions for public policy-making focused on the state's economic development.

The first two public policy programs formulated with Funses resources have the basic prerogative that long-term sustainable economic growth requires consistent gains and, if possible, regular productivity. Furthermore, productivity growth is directly related to the pace of technological innovations (Senna, 2017).

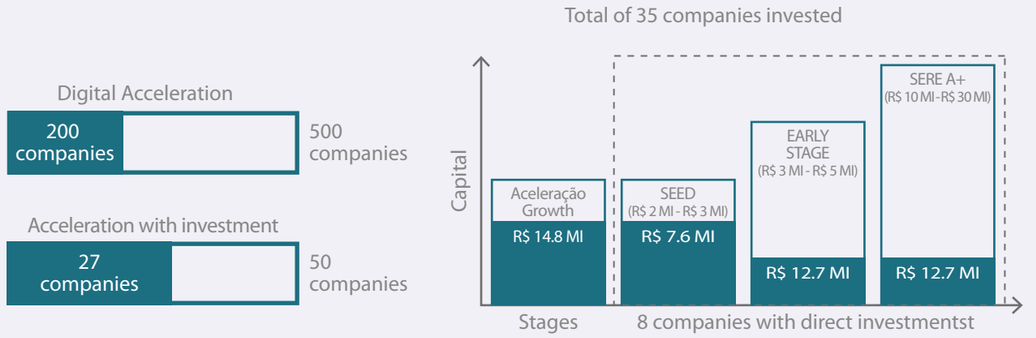
Bearing this in mind, Funses1, which is still ongoing, aims at fostering the innovation ecosystem in the state.

> **"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete"**
>
> Richard Buckminster Fuller

In general, the capital invested by Funses1 is allocated to startups that have – or will have – investments in the state of Espírito Santo or in the national territory, as long as the company's headquartered is located in the state.

Since it is a venture capital fund, the eligible investments contain technological, technical or even organizational innovations. So far, the outcomes have been significant.

See the chart below.



It is worth mentioning one more important piece of data: of the 35 companies invested by Funses1, 71% are located in Vitória.[5]

Regarding Funses' second program, Funses ESG Debentures, the purpose consists of financing projects that enhance the competitiveness of medium-sized companies in Espírito Santo's economy, through productivity rise and the incorporation of ESG and regional development agendas.

These two elements deserve to be highlighted in the design of this public policy. The first one refers to the state's inducement for projects chosen for funding that contemplate sustainable actions, and social and corporate governance best practices.

1. For a thorough analysis of the concepts and variables used by the National Treasury, see STN Ordinance No. 217, of February 15, 2024.

2. The Sovereign Fund's resources amount to BRL 1,923.740733. Accessed at: https://fundosoberano.es.gov.br on March 25, 2025.

3. In addition to these revenues, part of the resources came from the agreement between ANP and Petrobras regarding the unification of oil fields in the region of Parque das Baleias, in the southern seacoast of Espírito Santo.

4. To corroborate this statement, Funses was elected the best sovereign fund in Latin America and third best in the world, especially due to its transparency pillars, governance and structure, as per the 2025 Global Sovereign Funds Ranking, by the Sovereign Wealth Fund Institute.

5. For a demystifying reading on the role of the state in funding technological innovations, see Mazzucato (2014). Just to peak your curiosity, see the author's question after reporting examples in the USA and the United Kingdom: "how many perceive that many of the newest and most innovative American companies were not funded by private venture capital, but by public venture capital, such as the one offered by Small Business Innovation Research Programs (SBIR)?""

With an initial allocation of BRL 500 million by Funses, the previously mapped projects in energy and industry have the potential of mitigating 7.7 million tons of carbon until 2050.

The second element is in line with one of the state government's strategic guidelines, namely the reduction of social and economic inequalities among microregions. In this context, we sought to incentivize projects implemented in the countryside, with a more appropriate interest rate using Espírito Santo's Regional Sustainable Development Index (IDRS/ES), with the purpose of prioritizing investments and public actions[6].

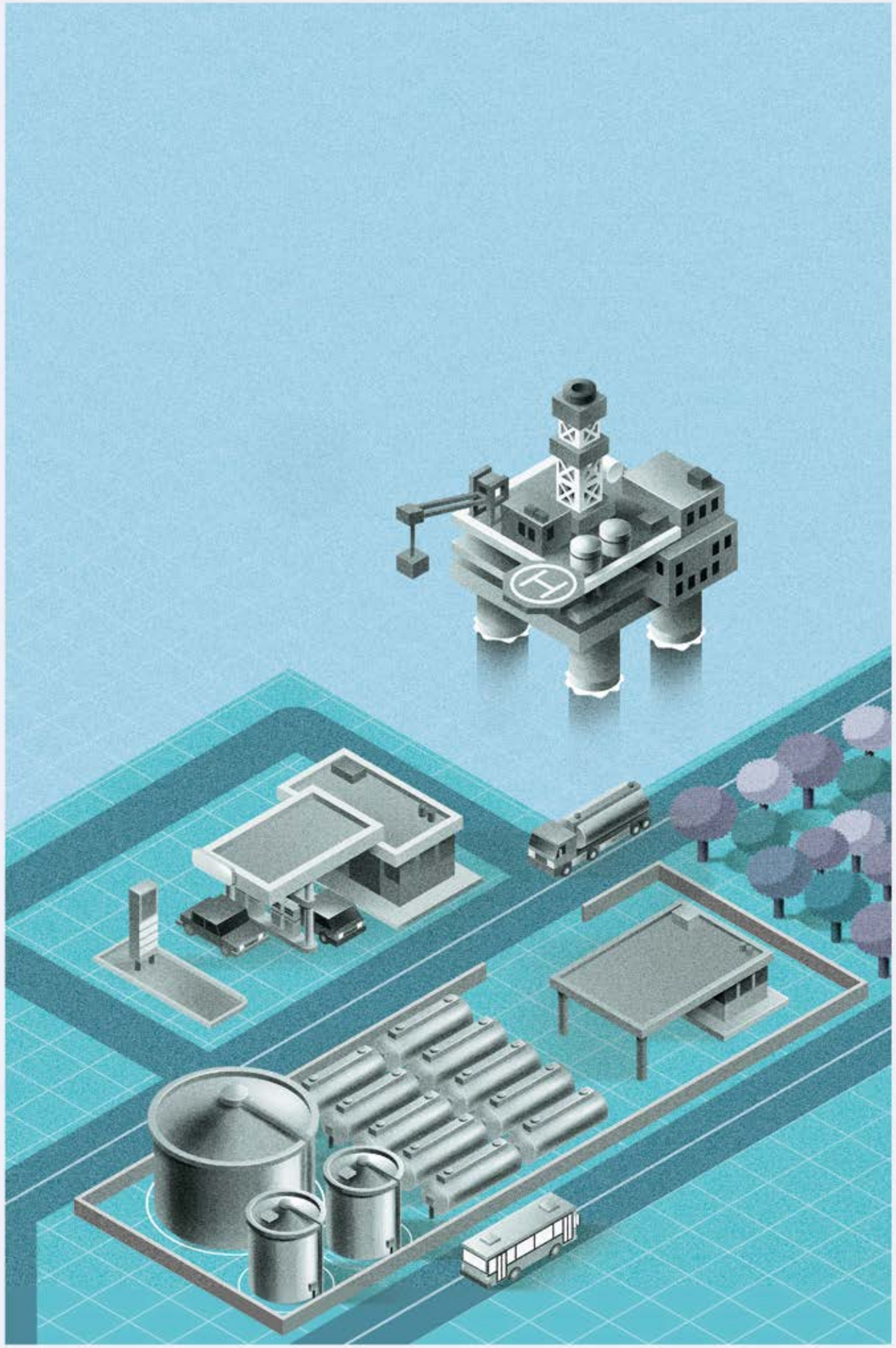
Lastly, in the middle of 2024, Bandes received an orientation of governor, Renato Casagrande, and vice-governor, Ricardo Ferraço, to elaborate a new public policy program with resources from Funses. This time, to enable the funding of the Plan of Decarbonization and Neutralization of greenhouse gas emissions (GHG), published in 2023[7].

Given this ambitious and relevant task, the Development Bank of the State of Espírito Santo – Bandes, as the financial branch of Espírito Santo's sustainable development, designed a new Investment Fund focused on decarbonization projects (the "Decarbonization Fund"). In other words, we are undergoing the structuring phase of modeling the appropriate financial instruments to streamline the achievement of the Decarbonization Plan's goals.

The fund's investment thesis focuses on projects mainly in the energy and industry sectors, with the purpose of supporting initiatives such as improvements in energy efficiency, solar energy generation and biomethane production/use[8]. Also adherent to the Fund are the sectors of Transportation and AFOLU (Livestock, Changes in the Use of Soil and Forests), as strategic segments of the Decarbonization Plan. It is worth adding that, in context of the industry, the concept of the Decarbonization Plan is in line with Nova Indústria Brasil, the current Brazilian industrial policy[9], which aims to support industrial projects focused on innovation, productivity and digitalization, with the purpose of reducing the carbon footprint of industrial products.

With an initial investment of BRL 500 million from Funses, the previously mapped projects in energy and industry have the potential to mitigate up to 7.7 million tons of carbon until 2050, which represents 24.7% of the expected emission reduction.

It is a crucial agenda that is knocking on the doors of our houses and cities, but, in Espírito Santo, the future is planned.



6. This index was elaborated by Instituto Jones dos Santos Neves. For further details, access: https://ijsn.es.gov.br/publicacoes/sumarios/idrs-preliminar.

7. Decarbonization is understood as the process of reducing the emissions of CO2 and other greenhouse gases, aiming at mitigating climate change and promoting environmental sustainability. https://planodescarbonizacao.es.gov.br/arquivos

8. It is worth highlighting that, contrary to other Brazilian states, where deforestation is the main source of emissions, most of Espírito Santo's emissions come from the Energy and Industry sectors, related to biofuel production and income generation. In 2021, approximately 32% of GHG emissions in Espírito Santo came from the energy sector, while the other equal portion came from the industry.

9. https://www.gov.br/mdic/pt-br/composicao/se/cndi/plano-de-acao/nova-industria-brasil-plano-de-acao.pdf

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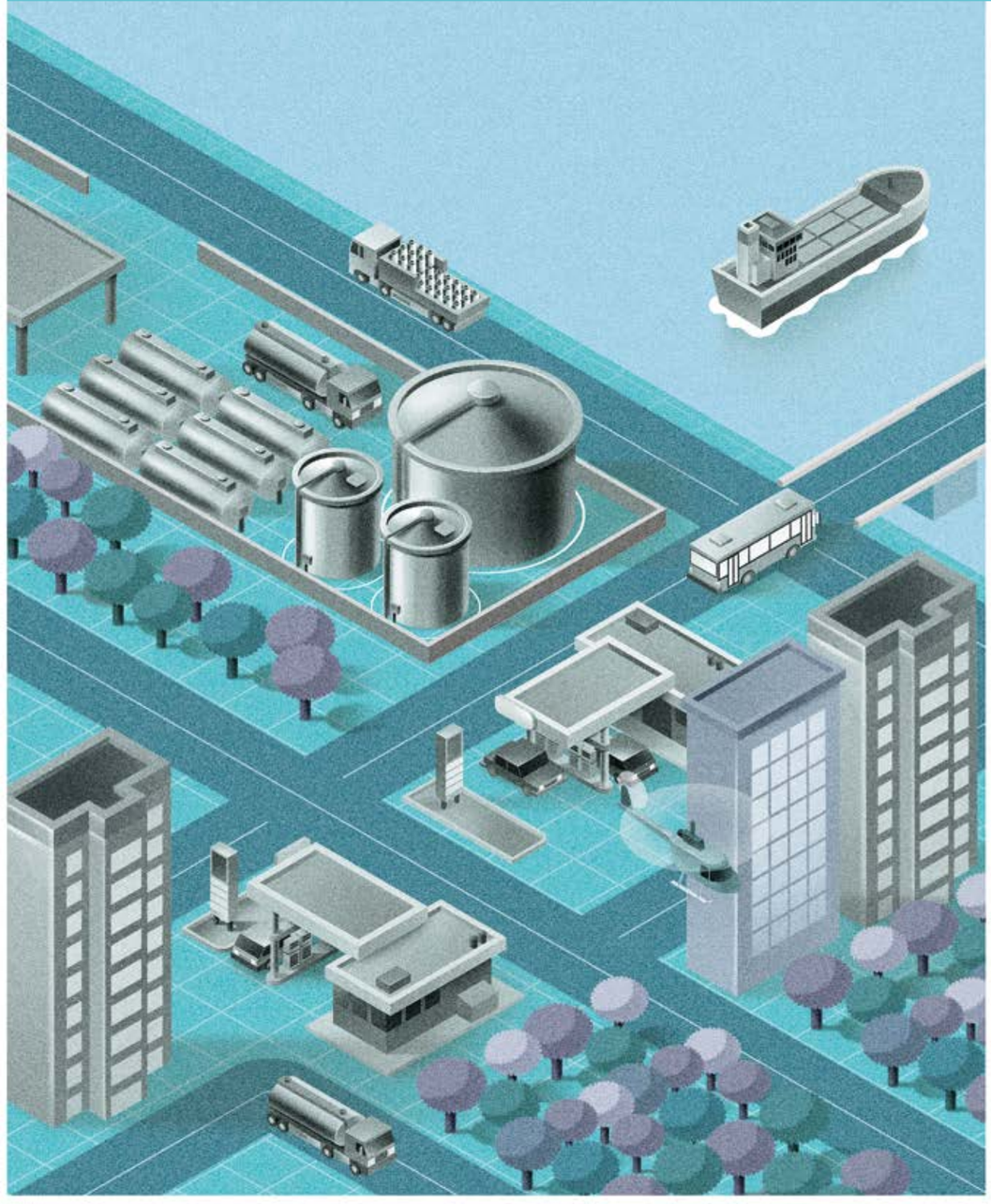


OPPORTUNITIES FOR ESPÍRITO SANTO

ANNOUNCED INVESTMENTS

In March 2025, Observatório Findes conducted a survey with companies in the Oil and Natural Gas production chain of Espírito Santo, with the purpose of mapping investment projects announced in the state, considering the period between 2025 and 2030. In order to apply the Survey, the team used information obtained using the Investment Compass (Bússola do Investimento), a product by Observatório Findes.

According to the survey, Espírito Santo is expected to receive BRL 44.2 billion[14], or USD 7.6 billion converted into dollars, in investments in the oil and natural gas industry by 2030. A total of seven projects have been identified in the state, with notable investments from Petrobras, PRIO, and BW Energy.

Petrobras has an investment plan of BRL 35 billion for Espírito Santo until 2029. Among the projects, the following is particularly highlighted: the Integrated Project of Parque das Baleias (IPB), which involves the interconnection of 17 wells to the new floating production storage and offloading unit (FPSO) Maria Quitéria – nine oil production wells and eight water injection wells. The FPSO began operating in the south of the state in October 2024. The company will also invest in refining, commercialization, gas, and energy activities in the state.

PRIO is developing the Wahoo field, located in the Espírito Santo portion of the Campos Basin. With estimated investments of BRL 850 million, the company intends to drill six wells, four for production and two for injection. Production will be transported through a 35 km subsea tieback connecting the Wahoo wells to FPSO Frade

BW Energy plans to invest BRL 4 billion between 2026 and 2031 in the Golfinho and Camarupim hubs, located in the Espírito Santo Basin. In the first field, the company will drill two wells, while in the Camarupim field gas will be connected to FPSO Cidade de Vitória.

In addition to these investments, other announcements have been made by oil companies and enterprises linked to the supply chain. Table 10 presents a summary of the projects mapped by Observatório Findes for Espírito Santo's oil and natural gas industry.

14. The average dollar from February 2025 was used to convert the values (USD 1 = BRL 5.766).

BRL 44.2 billion

is the value of confirmed investments in Espírito Santo's oil and natural gas industry until 2030

Table 10 - **Investment projects confirmed in Espírito Santo's oil and gas industry for the next five years (2025-2030)**

Investor	Project	Region	Value (in BRL million)	Value (in USD million)
Petrobras	Investments in exploration and production, notably the deployment of FPSO Maria Quitéria. The company will also invest in refining, transportation, marketing, gas, and energy.	Espírito Santo	35,000.0	-
PRIO	The Wahoo project includes the drilling of four production wells and two injection wells, as well as the tieback between the wells and FPSO Frade.	Presidente Kennedy	-	850.0
BW Energy	Investments in the operations of the Golfinho and Camarupim hubs, in the Espírito Santo Basin.	Aracruz, Fundão, Serra e Vitória	4,000.0	-
Prysmian Group	Expansion of production capacity at the Vila Velha plant, dedicated to the manufacture of umbilicals.	Vila Velha	145.0	-
ESGÁS (Energisa)	Energisa Group will invest in the expansion of natural gas distribution in Espírito Santo.	Espírito Santo	100.0	-
Shell	Development and production of Parque das Conchas. The investment includes development activities, extension studies, production completion, and upgrades related to changes in the production unit.	Anchieta, Guarapari, Piúma, Itapemirim, Marataízes, Presidente Kennedy, Vila Velha e Vitória.	-	13.8
EnP Ecossistemas e Imetame Energia	EnP Ecossistemas, through its affiliate Energy Paranã, and Imetame Energia hold interests in 11 exploratory blocks in the northern part of Espírito Santo.	Linhares, Jaguaré, São Mateus e Conceição da Barra	20	-
Total in the currencies announced			**39,265.0**	**863.8**

Total investments in BRL (USD 1 = BRL 5.766)	**BRL 44,245.7**
Total investments in USD (USD 1 = BRL 5.766)	**US$ 7,673.6**

Note: The investment surveyed in the Yearbook were confirmed by the companies through the Primary Survey carried out by Observatório Findes. Some companies surveyed chose to publish the value of their investments in dollars. The average dollar from February 2025 was used to convert the values (USD 1 = BRL 5.766).

Source: Petrobras, PRIO, BW Energy, Prysmian Group, ESGÁS, Shell, EnP Ecossistemas and Investment Compass (Bússola do Investimento). | Elaboration: Observatório Findes.

PERMANENT OFFER

The Permanent Offer (Oferta Permanente, or OP) is a system adopted by the National Agency of Petroleum, Natural Gas and Biofuels (ANP) to continuously offer exploration blocks and production fields in both onshore and offshore basins, including areas located within the pre-salt polygon and other strategic regions. Interested companies participate in the process through bidding cycles, and the winning bidders sign contracts under either the concession or production sharing regimes.

Since 2021, with the publication of CNPE Resolution No. 27 – amending CNPE Resolution No. 17/2017 – Permanent Offer has become the main mechanism for offering areas intended for oil and natural gas exploration and production in Brazil. This system operates in two modalities:

1 **Permanent Concession Offer (OPC):** applied to areas whose contracts follow the concession regime.

2 **Permanent Production Sharing Offer (OPP):** intended for areas under the production sharing regime.

As a continuous process, the bidding instruments of the Permanent Offer may be altered over time. In this context, in December 2023, CNPE Resolution No. 11/2023 established new guidelines for defining Local Content requirements[15] in future bidding cycles under the concession and production sharing regimes within the scope of Permanent Offer. The resolution determined that the minimum mandatory local content in upcoming OP cycles must be 50% for onshore blocks (for both the exploration and development phases), and 30% for offshore blocks in the exploration phase. For the development phase of offshore blocks, the minimum percentages are: 30% for well construction, 40% for the gathering and flow system, and 25% for the stationary production unit.

Under the concession regime, through the Permanent Concession Offer (OPC), four bidding cycles have already been completed in the country. The most recent public bidding session was held by ANP in the 4th Cycle, in 2023, during which 192 exploratory blocks were awarded across Brazil, covering the Pelotas, Potiguar, Santos, Paraná, Espírito Santo, Tucano, Amazonas, Recôncavo, and Sergipe-Alagoas basins.

The total signature bonuses collected by ANP represented a 179.7% premium over the minimum value required for the ex-

15. Oil and gas exploration and production contracts include a local content clause, which establishes the mandatory acquisition of part of goods and services from the domestic industry. Additionally, the clause provides preference for contracting Brazilian suppliers whenever their proposals are equivalent to those of other competitors invited.

192

exploration blocks were purchased in the Permanent Offer of 2023

BRL 16 million

is the minimum investment predicted for the exploration phase of the 10 exploration blocks granted during the 4th cycle of the Permanent Concession Offer

ploratory areas. In total, the winning bids committed to BRL 2.01 billion in investments for the exploration phase. In the Espírito Santo Basin, ten exploration blocks were awarded, with a minimum expected investment of BRL16.0 million for the exploration phase. The blocks were distributed between the companies Elysian and Imetame, the winners of the auction.

Due to changes and the suspension of the 4th Cycle concession contract signing schedule, the contracts were signed only in February 2025[16]. **As a result, the 5th Cycle of the Permanent Concession Offer was published only in February of this year.** Its public notice made 332 exploratory blocks available for expressions of interest throughout Brazil, comprising 44 onshore and 288 offshore blocks. These areas are spread across 32 sectors in 12 sedimentary basins, all located in new exploration frontiers. Of these blocks, 155 are in deep waters, 133 in shallow waters, and 44 are onshore.

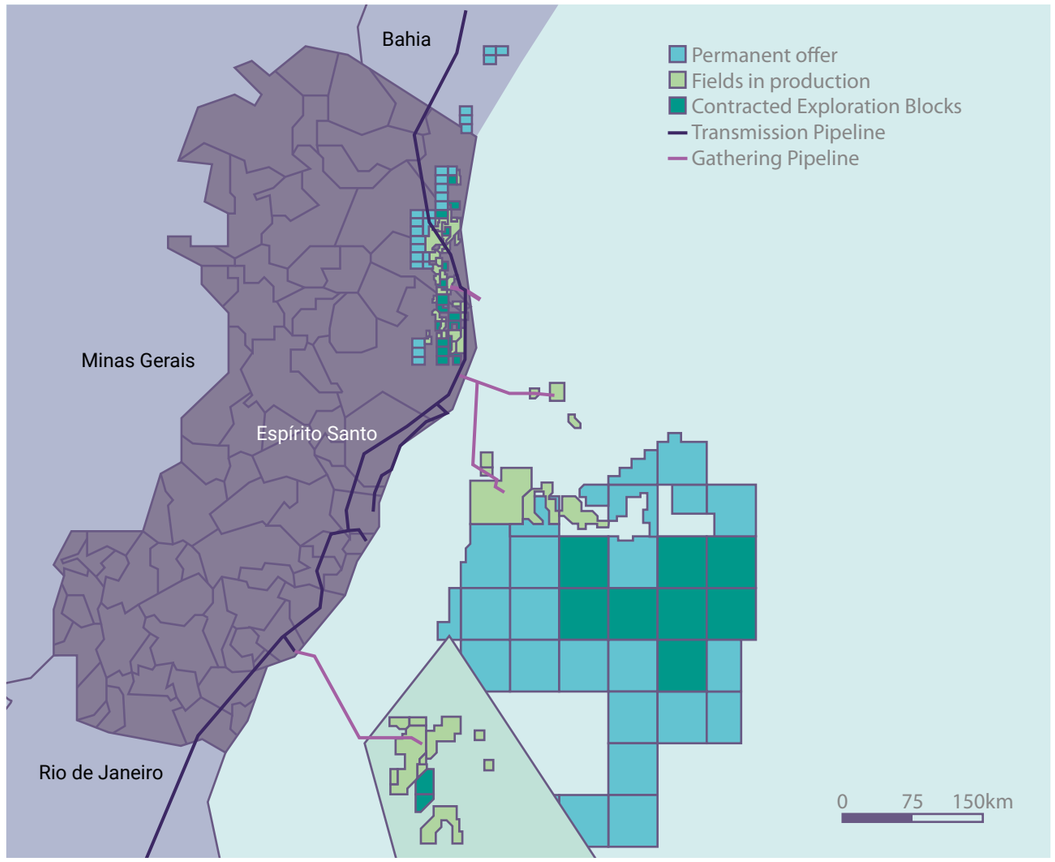
Specifically in Espírito Santo, 15 exploratory blocks are available under the concession regime, all located in offshore areas of the Campos and Espírito Santo basins. The schedule of 5th cycle includes the public session for the presentation of offers in June 2025, while the concession contracts are expected to be signed in November 2025. The minimum signature bonuses for these areas range from BRL 2.3 million to BRL 11 million (Table 11).

Table 11 - **Blocks available in Espírito Santo for expressions of interest in the 5th Cycle of the Permanent Concession Offer**

Sedimentary basin	Sector	Block	Minimum signature bonus (BRL)
Campos	SC-AP1	C-M-13	10.1
	717,675	C-M-69	6.3
	503,997	C-M-107	6.0
	716,471	C-M-109	6.6
	782,952	C-M-157	7.0
Espírito Santo	SES-AP1	ES-M-523	2.8
		ES-M-526	2.3
		ES-M-588	11.0
		ES-M-661	2.7
		ES-M-663	9.6
	SES-AP2	ES-M-737	3.8
		ES-M-789	4.4
		ES-M-791	4.3
	SES-AUP3	ES-M-745	2.4
		ES-M-793	2.4
			10.1

Source: ANP | Elaboration: Observatório Findes.

Figure 1 - **Exploration blocks in Espírito Santo available in the 5th Cycle of ANP's Permanent Concession Offer**



Fonte: ANP | Elaboração: Observatório Findes.

Under the production sharing regime, two bidding cycles have been held in Brazil under the Permanent Production Sharing Offer (OPP)[17], through which two blocks in the Campos Basin and three in the Santos Basin were awarded, generating BRL 923.30 million in signature bonuses.

As of the publication date of this edition of the Yearbook, 14 additional offshore exploration blocks in the country were added to the Permanent Production Sharing Offer. These areas are distributed across nine distinct sectors in the Campos and Santos sedimentary basins. **Among them are the Turmalina block, which**

16. The suspension affected the following blocks: AM-T-63, AM-T-64, AM-T-107, AM-T-133, PAR-T-335, and the marginal accumulation area of Japiim, which were subject to legal actions preventing the execution of the concession contracts.

17. According to ANP, the Permanent Production Sharing Offer (OPP) is a continuous offer of blocks located in the pre-salt area or in other strategic areas, under the production sharing regime. These blocks are subject to specific deliberation by CNPE, which defines the parameters to be applied to each field or block to be offered.

borders Espírito Santo, and the Larimar block, located at the border between the maritime territories of Espírito Santo and Rio de Janeiro.

However, according to Resolution No. 754/2023 by ANP's Board of Directors, the bidding notice for the Permanent Production Sharing Offer was revoked as of the publication date of this edition. According to ANP, the new versions of the notice and contracts for this offer are currently under public consultation and hearing (No. 06/2024). In other words, as of the date of this publication, the OPP cycle is suspended, and it is not possible to submit expressions of interest for these areas.

In addition to the exploration blocks already available for expressions of interest under the Permanent Production Sharing Offer, on February 18, 2025, the National Energy Policy Council (CNPE) approved the inclusion of four additional blocks: Hematita, Siderita, Limonita, and Magnetita. All of them are located within the pre-salt polygon, specifically in the Campos Basin, which spans the states of Rio de Janeiro and Espírito Santo.

DECOMMISSIONING OF FACILITIES

Decommissioning of facilities refers to the phase in the production cycle in which oil and natural gas exploration and production structures are safely dismantled after the end of their operational life. This process includes the removal of facilities, well plugging and abandonment, appropriate disposal of materials, waste and residues, as well as the environmental restoration of the area. ANP only authorizes the permanent cessation of operations when all possibilities for exploration and production in a given area have been exhausted.

By 2024, ANP had recorded 138 cases under the Facility Decommissioning Program (PDI) in Brazil. Of this total, 97 were approved – 55 in onshore areas and 42 offshore. In addition to the approved cases, 25 were classified as received, eight as suspended, and eight as closed[18].

21

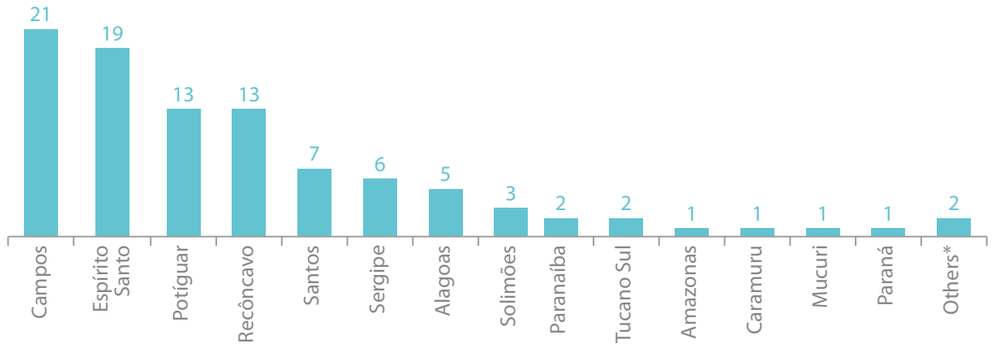
RDIs approved in Espírito Santo until 2024

The Campos Basin is the leader in number of PDIs in the country, with 34 cases, followed by the Potiguar Basin with 24, and the Espírito Santo Basin with 20. As for approved programs, at least 14 Brazilian basins had PDIs authorized by ANP until 2024. Among these, 21 were in the Campos Basin, 19 in the Espírito Santo Basin, 13 in the Potiguar Basin, and 13 in the Recôncavo Basin.

In the state of Espírito Santo, by the end of 2024, 21 PDIs had been approved. Of these, 20 were related to onshore assets located in the Espírito Santo Basin, while one referred to the Campos Basin, specifically for the decommissioning of FPSO Capixaba.

It is worth noting that FPSO Capixaba was located in Parque das Baleias, in the Campos Basin. According to Petrobras, the decommissioning phase of this unit was completed in March 2024, when the vessel was unmoored and sent to Denmark, where it will be dismantled. The platform operated in the state for 16 years, during which it produced 270.9 million barrels of oil equivalent. Its decommissioning process began in 2022. This floating unit for oil and gas production was replaced by FPSO Maria Quitéria, which began operations in October 2024 in the Jubarte field.

Chart 32 - **Distribution of Facility Decommissioning Programs (PDI) approved by ANP through 2024**



(*) Others: refers to basins not identified by ANP.

Source: ANP | Elaboration: Observatório Findes

According to ANP, the decommissioning of 3,773 wells across Brazil is expected to generate BRL 70.2 billion in investments between 2025 and 2029. In Espírito Santo, the decommissioning of 403 wells is estimated to result in an investment of BRL 5.36 billion over the same period — BRL 1.8 billion in the Espírito Santo Basin and BRL 3.6 billion in fields under state jurisdiction in the Campos Basin. By operational environment, investment is projected at BRL 181.03 million in onshore areas and BRL 5.18 billion in offshore areas.

This total amount of BRL 5.36 billion will be allocated to various activities over the next five years, including: permanent abandonment (BRL 3.9 billion), pipeline removal (BRL 634.7 million), removal of other subsea system equipment (BRL 520.8 million), demobilization of Oil Exploration Units (UEP) (BRL 167.6 million), well plugging (BRL 73.3 million), environmental restoration (BRL 46.0 million), and removal of facilities associated with Onshore Production Units (BRL 28.5 million).

18. As of the date of this publication, ANP had not yet publicly released further details on these new areas on offer.

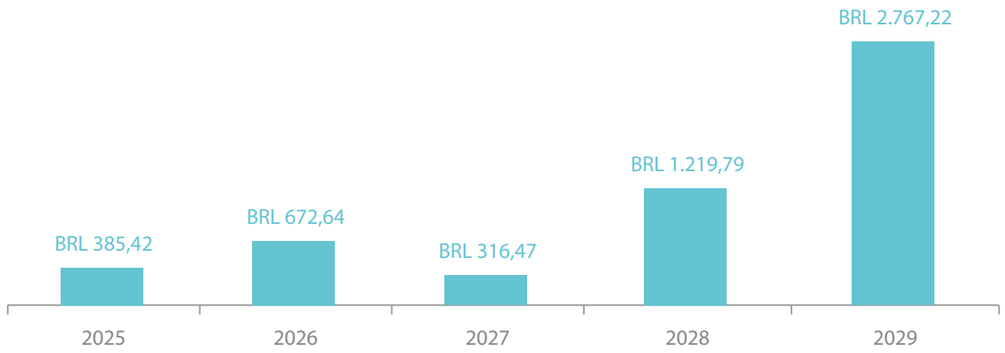
More information is available at: https://comunicaespirito-santo.petrobras.com.br/w/plataforma-fpso-capixaba-esta-a-caminho-da-dinamarca-apos-desativacao

Table 12 - **List of Decommissioning Programs (PDI) approved and received in the state of Espírito Santo in 2024**

Environment	Basin	PDI	Company	Status
Onshore	Espírito Santo	Mosquito	Petrobras	Approved
	Espírito Santo	Rio Preto	Petrobras	Approved
	Espírito Santo	Albatroz	Petrosynergy	Approved
	Espírito Santo	Mosquito Norte	Petrobras	Approved
	Espírito Santo	Garça Branca	Central Resource	Approved
	Espírito Santo	Rio Ibiribas	Petrobras	Approved
	Espírito Santo	Rio Doce	Petrobras	Approved
	Espírito Santo	Corruíra	Petrobras	Approved
	Espírito Santo	Rio Mariricu Sul	Petrobras	Approved
	Espírito Santo	Rio Mariricu	Petrobras	Approved
	Espírito Santo	Lagoa Parda Sul	Petrobras	Approved
	Espírito Santo	Rio Preto	Seacrest	Received
	Espírito Santo	Lagoa Do Doutor	Vipetro Petróleo	Approved
	Espírito Santo	Rio Barra Seca	Petrobras	Approved
	Espírito Santo	Barra Do Ipiranga	Petrobras	Approved
	Espírito Santo	Rio Itaúnas Leste	Petrobras	Approved
	Espírito Santo	Rio São Mateus Oeste	Petrobras	Approved
	Espírito Santo	Mariricu Oeste	Petrobras	Approved
	Espírito Santo	Jacupemba	Petrobras	Approved
	Espírito Santo	Nativo Oeste	Petrobras	Approved
Offshore	Campos	FPSO Capixaba	Petrobras	Approved
	Campos	Abalone	Shell	Received
		Argonauta	Shell	Received

Source: ANP | Elaboration: Observatório Findes

Chart 33 - **Forecast investments for Facility Decommissioning Programs (PDI) in Espírito Santo (in BRL million) – 2025 to 2029**



Source: ANP | Elaboration: Observatório Findes

ARTICULATION AND INNOVATION STRENGTHEN ESPÍRITO SANTO'S OIL AND GAS INDUSTRY

Rubya Salomão Amador

Executive secretary of Espírito Santo's Forum of Oil, Gas and Energy

The production sector's articulation of the companies' innovation are essential to strengthen Espírito Santo's oil and gas industry. With this combination, we have a more competitive, sustainable and attractive environment for investments. Likewise, it is possible to optimize production processes and consolidate the state as a strategic hub for Brazil's oil and gas industry.

Within this context, Espírito Santo's Forum of Oil, Gas and Energy (FCPGE) – coordinated by the Federation of the Industries of Espírito Santo (Findes) and with the participation of more than ten companies, in addition to institutions like Sebrae and the government of Espírito Santo – has played a strategic role.

Throughout the last few years, several efforts were made to support the development of the state's oil and gas industry, ensuring the necessary legal security for operations and creating a more predictable and efficient regulatory environment. Such initiatives involve discussions on regulatory mechanisms and processes, monitoring of administrative procedures, contributions to the elaboration of regulations and articulation among different stakeholders.

It is worth recalling that the Forum has an active role in the provision of technical data to support decision making and the construction of joint agendas with the state government, guaranteeing that public administrators have access to up-to-date information about the sector's evolution and main challenges. This work has been pivotal in structuring policies which are more in line with the reality of the industry, and providing a more competitive and sustainable business environment.

With dialog and production of technical information, – such as the Espírito Santo's Oil and Gas Yearbook, written and organized by Observatório Findes – we contribute to the consolidation of projects, the attraction of investments and the implementation of policies that balance economic development, sustainability and social welfare. By attending fairs and sectoral events, we manage to expand the access to information and generate business opportunities for local companies.

In terms of advocacy, we have worked as an intermediate between the production sector and the public administration, seeking not only to facilitate

The Espírito Santo's Forum of Oil, Gas And Energy (FCPGE) has an active role in the provision of technical data for decision-making and the creation of joint agendas with the State Government

investments, but also to guarantee that they follow a model that benefits Espírito Santo's society as a whole. In the last two years, the Forum has dedicated its work to initiatives that aim to strengthen this sector in Espírito Santo, articulating solutions for regulatory, fiscal and institutional challenges.

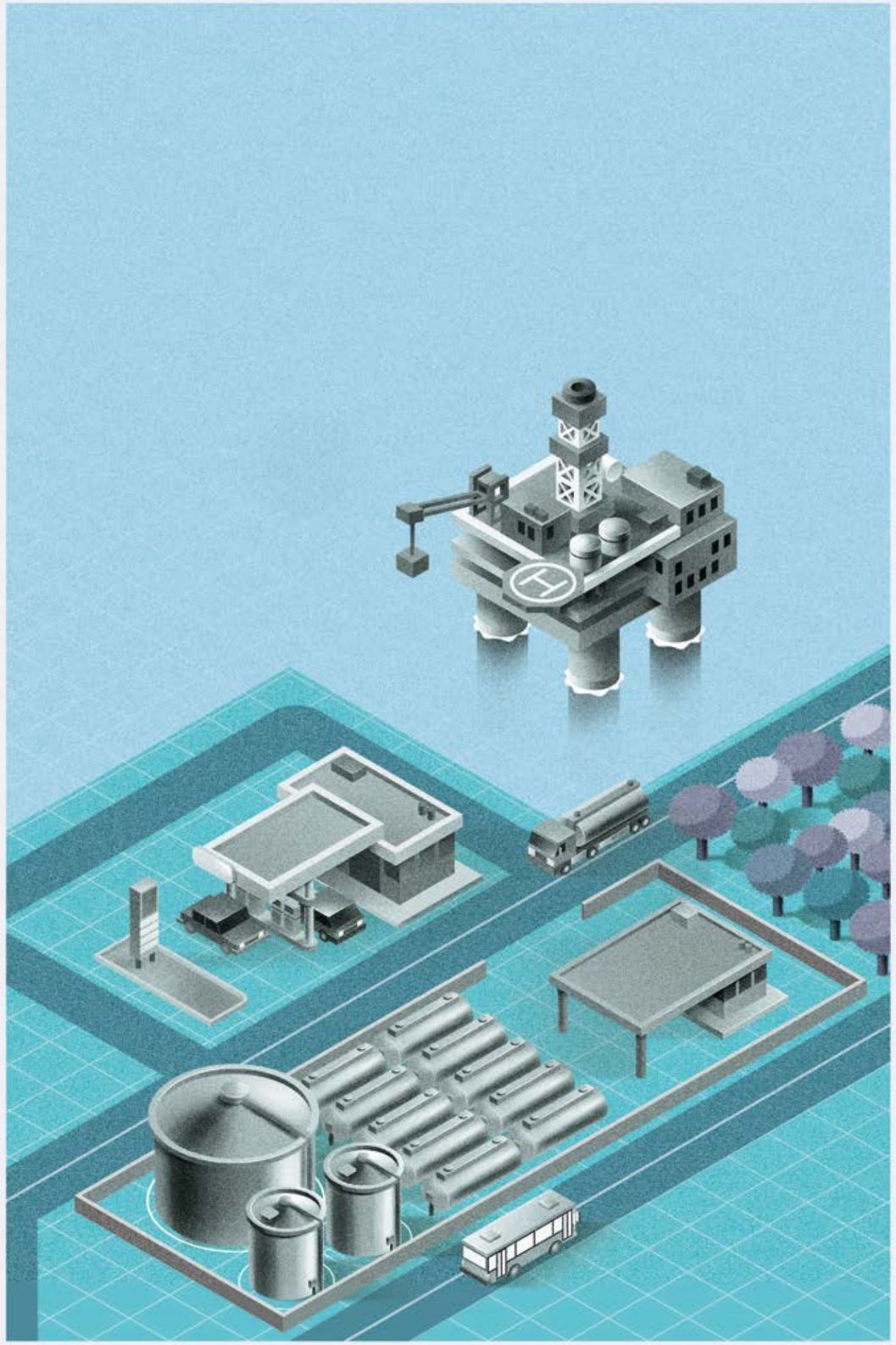
Some of these actions include, for example, state licensing for the divestment of the Golfinho and Camarupim fields, both in the northern region of the state. As part of these initiatives, we support the prioritization of the process by means of the program Código Verde from the state government, ensuring better regulatory predictability for field acquisitions.

We have also accompanied the operation of Polo Norte Capixaba and Lagoa Parda, located in the north of the state, providing support to the licensing process; the reactivation of onshore fields, resuming their production, and the generation of jobs in the region. As for the licensing process of the Wahoo Field, in the north of the state, we have organized institutional agendas with parliament members and regulatory entities to streamline the project, ensuring the inclusion of Espírito Santo in the route of new offshore investments.

Other examples of the Forum's efforts towards the oil and sector are the following:

- Participation as Amicus Curiae in legal proceedings, contributing to the execution of offshore activities and the preservation of the environmental counterparts established by the regulatory entity;
- Join work with the public administration on tax claims for the internalization of ICMS agreements, guaranteeing more competitiveness for Espírito Santo, and facilitating the attraction of companies and logistical activities focused on the offshore sector;
- Efforts to prevent the limitation of the use of resources in Research, Development and Innovation (R&D) clauses in the states located in the Southeastern region of Brazil, guaranteeing that these investments are strategically allocated;
- Support to the allocation of revenues derived from oil and gas exploration (royalties and special participation fees) in structuring processes that promote the socioeconomic development of Espírito Santo's municipalities.

These initiatives, among others, carried out throughout the last few years, confirm the importance of articulation among the production sector, the government and society for the construction of a more favorable environment for economic growth, always focusing on the sustainability and competitiveness in Espírito Santo.



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A

Adjacent wildcat well: A wildcat well is drilled to investigate the occurrence of oil or natural gas in an area adjacent to a discovery.

ANP - Brazilian National Agency of Petroleum, Natural Gas and Biofuels: Regulatory body for the oil, natural gas, and biofuels market in Brazil, with the exception of natural gas distribution, which falls under state jurisdiction.

Appraisal exploration well: A well used to delineate an oil or gas accumulation and/or to investigate fluid contacts, reservoir connectivity, and properties that support reservoir characterization.

Area Relinquishment Notice: Formal communication from the concessionaire to ANP informing the return of areas, as provided for in the contract. It must include a list of reversible assets located in the relinquished portion and the delimitation of the polygon of the areas to be retained.

B

Barrel of oil equivalent (boe): Unit of measurement that combines oil and gas production volumes, based on the equivalence of 1,000 m³ of gas ≈ 6.28981 barrels of oil (bbl).

Barrels of oil per day (bpd): Unit used to measure the daily production of oil in barrels.

Bidding rounds: Processes organized by ANP to auction areas for oil and natural gas exploration, under concession or production sharing regimes, to interested companies or consortia.

Brent: Type of crude oil extracted from the North Sea and traded on the London exchange, serving as an international benchmark for oil prices.

C

Carbon Carbon Capture, Utilization and Storage (CCUS): Acronym for a developing technology used to reduce CO_2 emissions into the atmosphere.

Concession: A form of delegation of an economic activity by the government, usually through a competitive process, to an economic agent that demonstrates the capacity to perform the activity at its own risk and for a specified timeframe. In Brazil, the concession contract is entered into by ANP, granting companies the right to explore and produce oil and natural gas within the national territory.

Concessionaire: A company established under Brazilian law, with headquarters and management in Brazil, with which ANP signs a concession agreement for oil or natural gas exploration and production in a sedimentary basin located within national territory.

Coke: Fuel derived from the agglomeration of coal, composed of fused mineral matter and carbon. It is a solid and cohesive residue remaining from the destructive distillation of coal, oil, or other carbonaceous residues, with a high carbon content.

D

Declaration of Commerciality: Formal notification from the concessionaire to ANP, through which the existence of a commercially viable reservoir within the concession area is declared.

Declaration of Signs of hydrocarbons: Concession contracts establish deadlines and work programs for exploration and production activities. According to these contracts, the concessionaire is required to notify ANP of any indication of hydrocarbons or other mineral resources in the concession area within a maximum of 72 hours after discovery.

Decommissioning: Set of legal, technical, and engineering procedures applied in an integrated manner to a pipeline, aimed at ensuring its deactivation complies with safety requirements, environmental protection, reliability, and traceability of information and documentation.

Deep waters: Oceanic waters located at any distance from the coastline, where the seabed depth ranges from 300 to 1,500 meters.

Deeper prospect exploration well: A well drilled to investigate the presence of accumulations or favorable geological conditions at greater depths within a specific area.

Development plan: Planning instrument for the development and production of an oil field, covering its entire life cycle. It outlines the activities and investments to be undertaken and serves as a reference for medium and short-term plans, which must be aligned with it.

Disposal well: A well used for disposing of fluids produced from other wells or various effluents generated during exploration and production activities, into non-producing zones.

Dual-purpose well (production and injection): A well that simultaneously operates as a hydrocarbon producer and a fluid injector, in distinct intervals.

E

Energy matrix: The combination of energy sources used to meet global, national, or regional energy demands. These sources may be renewable (such as wind, hydroelectric, solar, among others) or non-renewable (such as oil, coal, natural gas, and nuclear energy).

Exajoule: Unit of energy measurement adopted by the International System of Units (SI). One exajoule (EJ) is equivalent to 10^{18} joules (J). For reference, one calorie equals 4.1868 J.

Exploration block: Geographically defined area within a sedimentary basin where oil and natural gas exploration activities are conducted.

Exploration phase: Stage aimed at the discovery and assessment of oil and/or natural gas reservoirs. Exploratory activities include the acquisition of seismic, gravimetric, magnetometric, and geochemical data, as well as the drilling and evaluation of wells, among others. This phase must necessarily include the fulfillment of the Minimum Exploration Program (PEM) agreed upon with ANP.

F

Financial compensation: Amount owed to the Federal Government, states, and municipalities for the use of natural resources, considering that these entities bear the impacts of exploration and production activities.

Fossil fuel: A type of non-renewable fuel formed from the decomposition of organic matter (such as plants and certain organisms) fossilized over thousands of years. These fuels are carbon-rich, such as oil, coal, and natural gas.

G

Governmental Takes: Payments owed by concessionaires engaged in oil and natural gas exploration and production activities, in accordance with Articles 45 to 51 of Law No. 9,478 of 1997, and Decree No. 2,705 of 1998.

H

Hydrocarbon: Chemical compound composed exclusively of carbon and hydrogen atoms. Oil and natural gas are examples of hydrocarbons.

I

Injection exploration well: A well drilled for injecting fluids into the reservoir to enhance hydrocarbon recovery.

Injection well: A well operating as a fluid injector to enhance hydrocarbon recovery from the reservoir.

Injection well for storage: A well operating as a fluid injector, intended for natural gas storage.

L

***Lavra* (Extraction):** Set of coordinated operations aimed at extracting oil or natural gas from a reservoir, including the preparation of the resource for transport.

Local content: Oil and gas exploration and production contracts include a local content clause, a provision that requires part of the goods and services acquired for these activities in Brazil to be of national origin. The clause also establishes preferential contracting of Brazilian suppliers whenever their offers are equivalent to those of other suppliers invited.

M

Marginal fields: Inactive areas where there has been no production of oil and/or natural gas, or where production has been discontinued due to lack of economic viability.

Mature basin: A sedimentary oil basin whose production is already in decline.

Mature fields: Oil fields whose production is already in decline.

Minimum Exploration Program (PEM): Set of exploratory activities to be carried out by the concessionaire during the exploration phase, defined by ANP based on the evaluation criteria of the areas to be explored.

N

Natural gas: Hydrocarbon that remains in a gaseous state under normal atmospheric conditions, extracted directly from oil or gas reservoirs. It includes wet gas, dry gas, residual gas, and rare gases.

O

Observation well: A well equipped with instruments for monitoring reservoir pressures in hydrocarbon-producing reservoirs or natural gas storage structures.

Offshore: Marine environment, land-sea transition zone, or area located at sea.

Oil consumption: Activity consisting of the use of crude oil to manufacture derivatives.

Oil fields: Areas that produce oil or natural gas, consisting of a single continuous reservoir or multiple reservoirs at varying depths, including facilities and equipment intended for production. (Source: Law No. 9,478, of 08/06/1997)

Oil & gas value chain: Set of activities comprising the sector's production chain, from crude oil extraction to the final stage of value addition. It is divided into four segments: exploration, refining, petrochemical industry, and transformation industry.

Oil products: Products obtained from the processing of crude oil.

Oil production: Set of coordinated operations intended to extract oil or natural gas from a reservoir and prepare it for transport, as defined in item XVI of Article 6 of Law No. 9,478/1997. The term may also refer to the volume of oil or natural gas extracted during the production process, depending on the context.

Oil refining: Activity carried out by an industrial unit that uses crude oil from extraction and production fields as its raw material. Through processes such as heating, fractionation, application of pressure and vacuum, as well as reheating with catalysts, oil products are obtained—ranging from the lightest (refinery gas, LPG, naphtha) to the heaviest (bunker, fuel oil), including solid fractions such as coke and asphalt residue.

Oil well: A well drilled at the surface for the purpose of producing oil and/or natural gas.

Onerous transfer/transfer of rights (cessão onerosa): Model of transferring an exploratory area to Petrobras through bilateral negotiation, involving the payment of a pre-established amount. This model was regulated by Law No. 12,276, of 06/30/2010, and limits exploration to up to 5 billion barrels of oil equivalent (boe).

Onshore: Terrestrial environment or area located on land.

P

Payment for land use or retention: Amount paid by concessionaires to landowners where oil and natural gas exploration and production activities take place. This payment may occur in two methods: (i) annually, based on unit values in Brazilian reais per square kilometer of the concession area, as specified in the public notice and the contract, and applicable successively to the exploration, development, and production phases. The amount is determined by ANP, taking into account the geological characteristics and location of the sedimentary basin; (ii) monthly, based on the equivalent of 1% of the total oil and natural gas production volume from the field in the month of assessment, multiplied by the respective reference prices.

Permanent offer: Ongoing offer model for relinquished fields (or those in the process of being relinquished) and exploration blocks that were previously offered in bidding rounds but were not awarded or were later returned to ANP (Article 4 of CNPE Resolution No. 17, dated 06/08/2017).

Permanently abandoned well: A well for which there is no interest in future reentry, and where operations have been carried out to install sets of permanent barrier systems.

Petroleum: Any and all liquid hydrocarbons in their natural state, such as crude oil and condensate, whose exploration and production are regulated by Law No. 9,478 of 8/6/1997.

Plugged and abandoned well (fully decommissioned): A permanently abandoned well from which all surface wellhead equipment has been completely removed, and the surface casing has been cut at the base of the cellar.

Pre-salt: A subsurface region defined by a vertically oriented prism of indeterminate depth, with a polygonal surface outlined by the geographic coordinates of its vertices, as established in the Annex to Law No. 12,351/2010. It also includes other regions that may be defined by Executive Order as geological knowledge advances.

Primary energy: The form in which energy is naturally available in its raw state, prior to any conversion or transformation process. Examples include wind, river water, coal, and natural gas.

Production sharing: Oil and natural gas exploration and production model that, in addition to royalty payments, provides for the physical division of hydrocarbon production between the Federal Government and the contractor, after deducting the costs incurred in exploration and production activities. This model is regulated by Law No. 12,351 of December 22, 2010.

Production unit (exploration and production): Set of facilities intended for the separation, treatment, storage, and transportation of fluids produced and handled in an oil and natural gas field.

Production exploration well: A well drilled for draining one or more reservoirs in a field.

Production phase: Stage in which oil and/or natural gas accumulations discovered, whose commercial viability has been proven, are developed and brought into production to supply the market, resulting in the establishment of a production field.

Production well: A well operating as a hydrocarbon producer.

Proved reserves: Quantity of oil or natural gas whose existence has been confirmed through geoscience and engineering data analysis, with a reasonable degree of certainty regarding its economic viability and potential for commercial recovery.

R

Reference price: Value calculated based on the physicochemical characteristics of the crude oil stream. For each field, an analysis of the True Boiling Points (TBP curve) is conducted, which defines the light, medium, and heavy fractions of the oil. Based on these fractions, the oil's value is estimated using international market quotations for by-products.

Relinquished fields: Areas returned to ANP through an Area Relinquishment Notice. The relinquishment entails the suspension of all exploration activities in the relinquished portion, except for decommissioning operations and environmental remediation.

Renewable energy: Energy generated from natural resources that regenerate continuously and are therefore considered inexhaustible. The main sources include solar, wind, hydroelectric, geothermal, and biomass energy.

Repetro goods: Goods under a special customs export and import regime, intended for oil and natural gas exploration and production activities, with suspension of customs duties.

Royalties: Financial compensation owed to the Federal Government, states, and municipalities by oil or natural gas exploration and production concessionaires. Royalties are paid monthly based on the field's production volume in the month of reference, starting from the beginning of production.

S

Sedimentary basin: A depression in the Earth's crust where sedimentary rocks accumulate and may contain oil or gas, whether associated or not.

Shallow waters: Oceanic waters located at any distance from the coastline, where the seabed depth ranges from 0 to 300 meters.

Shallower prospect exploration well: A well drilled to test for accumulations or favorable geological conditions at shallower depths in a given area.

Shut-in well: A completed well that has already operated in production or injection mode but is currently shut in, pending normalization of surface conditions, further studies for decision-making, or rig intervention for reassessment, recompletion, restoration, abandonment, or other purposes.

Signature bonus: Amount offered by the winning bidder in the proposal to obtain a concession for oil or natural gas exploration, which must not be lower than the minimum amount set in the public notice. A portion of this amount is allocated to the Federal Government and another to ANP.

Special participation: Extraordinary financial compensation owed to the Federal Government, states, and municipalities, pursuant to ANP Resolution No. 12/2014, by oil or natural gas exploration and production concessionaires in cases of large production volumes or high profitability.

Special-purpose well: A well drilled for specific purposes that do not fall under previously defined categories.

Storage well: A well intended for natural gas storage operations, including injection, withdrawal, and monitoring.

Stratigraphic exploration well: A well drilled to identify the stratigraphic column and obtain surface geological data in a basin or region that remains underexplored.

T

Temporarily abandoned well with monitoring: A well for which there is interest in future reentry, where barrier systems have been installed and are subject to periodic monitoring and/or verification.

Temporarily abandoned well without monitoring: A well for which there is interest in future reentry, where barrier systems have been installed, but which are not monitored and/or verified.

U

Ultradeep waters: Oceanic waters located at any distance from the coastline, where the seabed depth exceeds 1,500 meters.

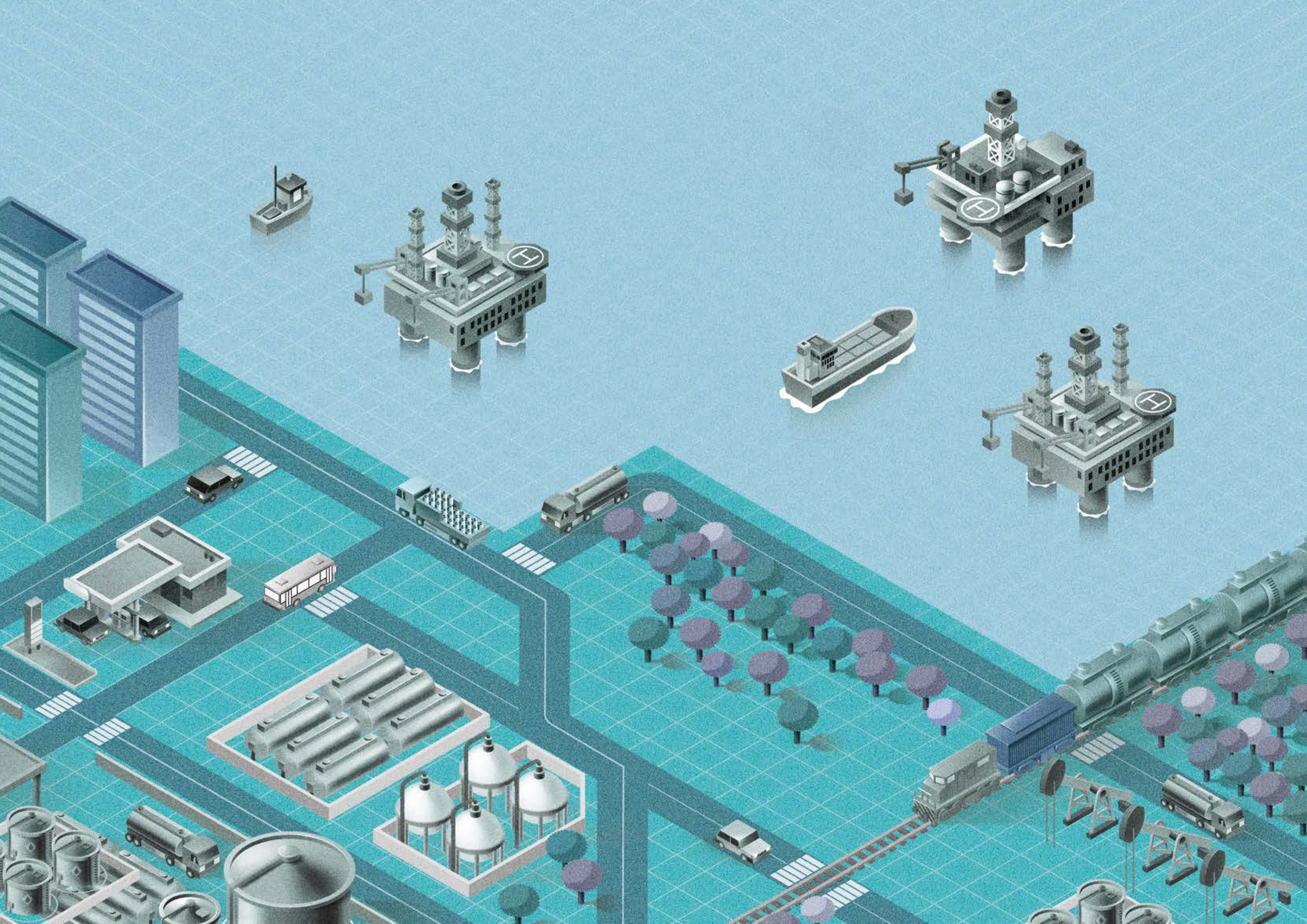
Upstream: Segment of the oil industry that encompasses exploration, development, production, and transportation activities up to the refineries.

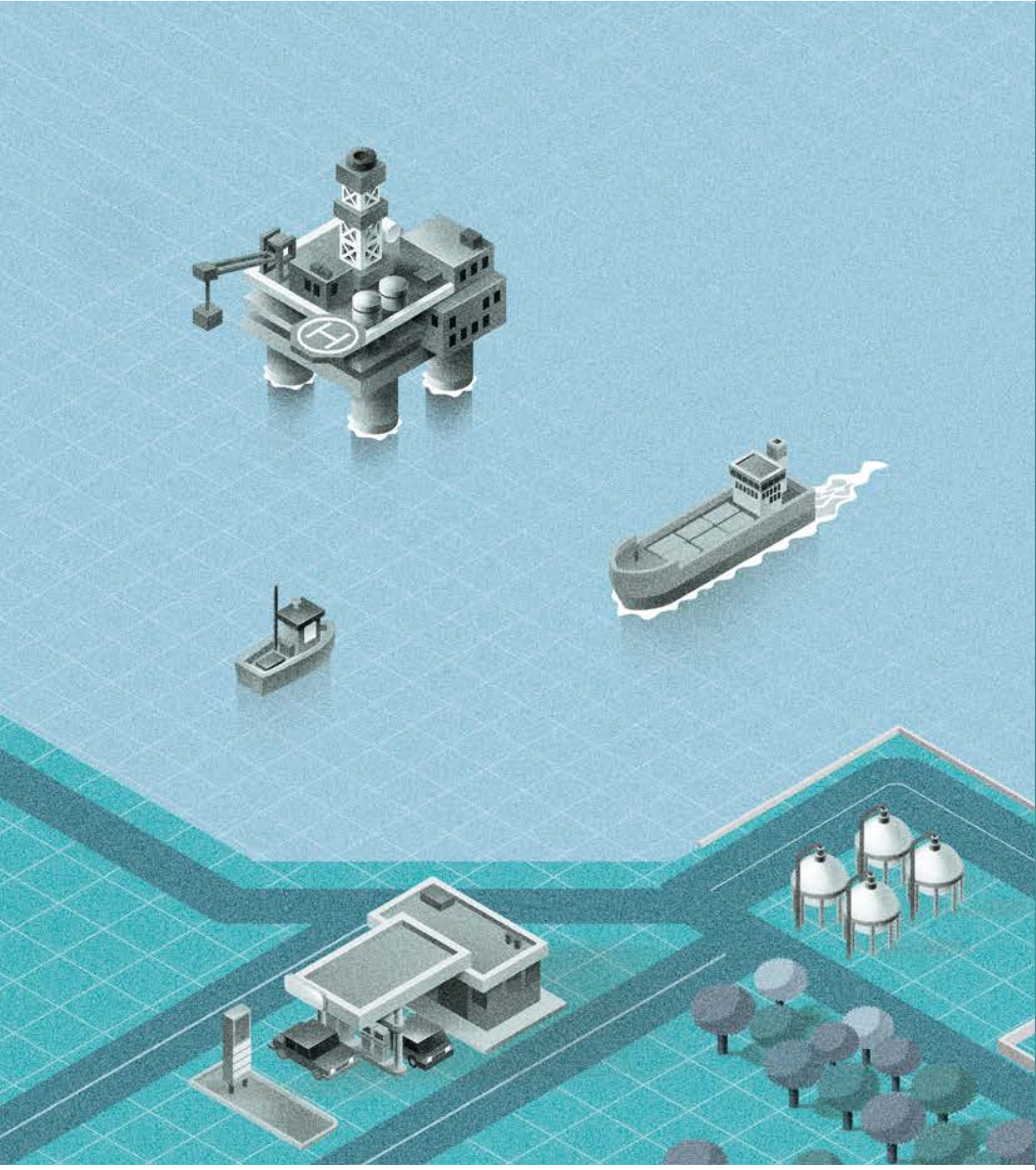
W

Wildcat exploration well: A well drilled to test for oil or natural gas in one or more targets of a geological prospect that has not yet been drilled.

Withdrawal well: A well operating to withdraw natural gas from a storage reservoir.

WTI (West Texas Intermediate): Crude oil extracted from the Permian Basin, located in western Texas and eastern New Mexico, traded on the New York Stock Exchange. Its price is widely used as an international benchmark for oil prices.





FINDES Observatório FINDES

Suport

Fórum Capixaba de Petróleo, Gás e Energia

SEBRAE

ibp INSTITUTO BRASILEIRO DE PETRÓLEO E GÁS

ONIP Organização Nacional da Indústria do Petróleo

ABPIP ASSOCIAÇÃO BRASILEIRA DOS PRODUTORES INDEPENDENTES DE PETRÓLEO E GÁS

FINDES IEL