RIO DE JANEIRO OIL INDUSTRY YEARBOOK

OVERVIEW 2018

SISTEMA FIRJAN

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July 2018

Sistema FIRJAN | FIRJAN CIRJ SESI SENAI IEL SISTEMA FIRJAN

INFORMING, FORMING, TRANSFORMING.

2018. FIRJAN – FEDERATION OF INDUSTRIES OF THE STATE OF RIO DE JANEIRO
SESI-RJ – INDUSTRY SOCIAL SERVICE OF THE STATE OF RIO DE JANEIRO
SENAI-RJ – NATIONAL SERVICE FOR INDUSTRIAL LEARNING OF THE STATE OF RIO DE JANEIRO

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EDITORIAL

When the environment appears to us a certain degree of predictability, reality draws our attention to the urgency of change in favor of our society. Our will is no different, committed to bring once again information about the oil market, so unique to the economy, as we deliver the **Rio de Janeiro Oil Industry Yearbook**.

It is clear that we need to continue the debate about what meaning we want to give to our wealth. We have the opportunity to define in what position we want to see our country in global geopolitics 30 years from now.

We need only to turn our attention to the appetite of companies in the last bidding rounds for us to see the strength of the reserves and the potential of Brazil in the oil industry. The new cycle of opportunities in the country has already begun. The transition that the world is experiencing to a low-carbon economy has no return. We must hurry and work in the short term to enjoy the opportunities that oil brings now.

We continue not only with the pre-salt on the coast of the state of Rio de Janeiro, but also opportunities to revitalize the post-salt and develop partnerships to increase our onshore production capacity in the North and Northeast of Brazil.

Only together, with synergy, will we advance. A permanent discussion environment among the main players in this market is fundamental. And we will only achieve if we continue working together. We therefore revitalized ONIP (National Oil Industry Organization), which will undertake actions to develop the competitiveness of the national industry.

The discussion on the best business models must be furthered in order to achieve even more promising results. We cannot leave aside the industrial policy guidelines, in order to make our national industry an exporter, achieve greater energy independence in the derivatives market, increase investment in Research, Development and Innovation (R,D&I) in suppliers, speed up the environmental licensing processes and unlock mature fields, among others.

Oil transcends generations and its multiplier effects must be harnessed not to correct past mistakes, but rather to build a true legacy that meets the sustainability of our planet. We will continue to strengthen partnerships and add new visions that will contribute to the joint implementation of a prosperity strategy.

Enjoy your reading!

Eduardo Eugenio Gouvêa Vieira
President of FIRJAN and
President of the ONIP Deliberative Council

ACKNOWLEDGMENTS

For the publication of the third edition of the **Rio de Janeiro Oil Industry Yearbook**, we have the internal support of the leaderships as well as of the partner areas that contributed generously to the best result.

Rio de Janeiro Oil Industry Yearbook - Overview 2018 is a product of the work of the **Sistema FIRJAN** in highlighting the importance of the state of Rio in such a market as vast as that of oil.

We would like to express our thanks to our Partners and Sponsors, who not only contributed to making this project a reality, but also added content to the final result.

To **JLT** – our thanks for the close partnership and with a new vision on the Brazilian oil market;

To **BP** – for the contribution with the vision of a major over the E&P segment in Brazil.

To **Total** – partner in this document and which we also thank for leading our Oil and Gas Business Council.

To **Plural** – which is to be the first of many other fruitful joint operations.

To **BNDES – Brazilian Development Bank** which spared no effort in contributing to a critical assessment of how we can improve this market's results in the country.

To **MME – Ministry of Mining and Energy**, by the Executive Secretariat, which has been working tirelessly on the government's work agenda to make new investments viable.

To **ANP – Brazilian National Agency of Petroleum, Natural Gas and Biofuels**, which contributed as a primary source of information and generously elaborated the market maps, we wish our votes of gratitude and respect.

To **Petrobras**, with which we reinforce our joint action to access and develop the Brazilian oil market and the economy of Rio de Janeiro.

To **IBP – Brazilian Petroleum, Gas and Biofuels Institute**, we reinforce our esteem for the valuable collaboration with its vision of the context of the oil market in Brazil and Rio de Janeiro.

QUOTES

"FIRJAN has the fundamental role of promoting actions and providing information that stimulates the economic growth of the state of Rio de Janeiro. With the resumption of growth in the oil and gas industry, forums and debates such as those recently promoted by FIRJAN and informative reports such as this yearbook are of utmost importance to the industry. The moment is opportune for us to understand the topics under discussion by the market, to identify solutions and to know future obstacles. Knowledge allows us to organize and plan corporate strategies. It is my expectation that the information contained in this "Yearbook" may encourage further discussions among leaders of the sector so that we are ready for this recovery of the industry."

Adriano OKA,
CSO JLT BRASIL/ COO/VP JLT BENEFÍCIOS & RESSEGUROS

"The year 2017 will enter into the history of the oil and gas sector as the year of recovery. The regulatory changes, starting from the end of 2016, with the end of Petrobras' obligation to be the sole operator in the pre-salt, continued last year. The creation of the multi-annual calendar of rounds, the new local content model for the bidding rounds from 2017, the incentives to increase production in mature fields, the launching of the Open Acreage of Areas, among others, helped Brazil to return to the international scenario as a promising horizon for investments. The results did not take long to appear. The 14th Round of Exploratory Blocks and the 2nd and 3rd Sharing Rounds held by ANP, with a collection of around R$ 10 billion in signature bonuses and forecast of billions of BRL in investments in the coming years, have confirmed investors' interest in the potential of the Brazilian basins and the correctness of the measures taken. The results achieved in 2017 have brought optimism back to the sector, not only in the upstream but also in the refining and downstream, which currently offer a large number of investment opportunities. Favorable expectations have already started to be confirmed. The extraordinary result of the 15th Round of Exploratory Blocks, held in early 2018, which set a new record in the collection of signature bonus, with approximately R$ 8 billion, showed that the work being carried out by the government and ANP is in the right path. It is this historic recovery that the 2018 Rio de Janeiro Oil Industry Yearbook, elaborated by Firjan, will record, helping to consolidate the recovery of the oil and gas sector, strategic for Rio and for Brazil. Disclosure of the successes achieved in recent months will guide the improvements that will certainly be made in the future. Firjan, with the Yearbook, makes an immense contribution to the state and the country."

Décio Oddone,
GENERAL DIRECTOR OF ANP

"Firjan guarantees Rio de Janeiro as a Strategic Forum of the Energy Sector, launching another edition of the Rio de Janeiro Oil Industry Yearbook, a mandatory reading for those who want to invest in Brazil"

Marcio Félix,
EXECUTIVE SECRETARY OF THE MME

"The Rio de Janeiro Oil Industry Yearbook fulfil an important role by providing detailed information of a sector with a huge potential for the resumption of investments in the country. The publication not only outline an overview of the sector to diverse players in the market, but goes beyond that, fomenting the technical knowledge dissemination of strategic information to aid the decision making process and also of opportunities in the state of Rio. It is a key initiative of FIRJAN, that shows its part in the development of Rio de Janeiro and Brazil."

Marcos Ferrari,
GOVERNMENT AND INFRASTRUCTURE DIRECTOR

"The discoveries and the production in the deposits of the pre-salt layer represent a significant mark for Petrobras and its partners, unequivocally demonstrating the great opportunities for the chain of goods and services in the country. Rio de Janeiro, as one of the states in the pre-salt province, has a privileged position in the future of the oil and gas industry in the country. The 3rd edition of Firjan's Yearbook, on bringing the vision of this and other opportunities in the State of Rio de Janeiro, will subsidize the decisions of entrepreneurs and investors, boosting investments and development in Rio."

Ivan Monteiro,
PRESIDENT OF PETROBRAS

"The FIRJAN Oil Industry Yearbook comes at a time when it is even more necessary to unite the main players in this sector, which is extremely important for Brazil and its socioeconomic development. To think of a responsible and competitive industry in the future, we must overcome the current challenges, drawing a sustainable path to be followed. For that matter, publications like this are fundamental to draw a panorama of the industry and base future business strategies, enabling the continuous investment of companies in the country."

Maxime Rabilloud,
PRESIDENT OF TOTAL E&P BRAZIL

"The information, presented in the FIRJAN document 2018 Rio de Janeiro Oil Industry Yearbook, is essential for decision making in any activity, especially in a highly regulated sector such as Oil and Gas. During the new bidding rounds, promoted by the National Oil, Natural Gas and Biofuel Agency (ANP), it is common to form strategic alliances and important partnerships. The sharing of risks, exchange of technology, strengthening of corporate governance, qualification, training and research bring benefits to the industry, which is replicated across the national chain of supply, products and services. Recent regulatory developments demonstrate the commitment of the Brazilian government to improve competitiveness in the oil industry, especially motivating other foreign and national companies to operate in the national territory. BP intends to use its vast experience in order to add value to large projects that require high investments, such as Pre-Salt. Thus, BP is aware of new opportunities and believes in the strength of its strategic partnership with Petrobras; formalized through a memorandum of understanding (MOU) signed on April 12, 2018, which should create opportunities for the national industry."

Adriano Bastos,
PRESIDENT OF BP ENERGY BRAZIL

"I would like to congratulate FIRJAN for the launching of the second edition of the Rio de Janeiro Oil Industry Yearbook, a publication that discusses crucial issues for the State and for the Country. The work of the Federation of Industries in favor of one of the most vital sectors of our economy is remarkable. On behalf of Plural, I was honored when I received the invitation to participate in the yearbook. I take this opportunity to reinforce Plural's willingness to always contribute to Firjan in finding the most appropriate means for the development of the Brazilian downstream market. Both entities are guided by ethics and transparency and, I am sure, will always be ready to work for the growth of Rio de Janeiro and Brazil."

Leonardo Gadotti,
EXECUTIVE PRESIDENT OF PLURAL

"The FIRJAN Oil Industry Yearbook reinforces the importance and relevance of our sector to the state of Rio de Janeiro and also to Brazil. As the house of the industry, IBP values actions that bring the industry to the most important discussions in order to attract investments and generate production, goods and benefits for the country. We are living a special moment, in which the industry is undergoing a recovery of its activities and new auctions scheduled for this and next year. For that matter, it is extremely important for us to gather data that can guide the future strategies of the industry, allowing Brazil's competitive power to go beyond exploratory potential, being one of the most attractive in all areas of the sector"

José Firmo,
PRESIDENT OF IBP

DOCUMENT OVERVIEW

Our contribution is anchored in the belief that the oil market in Rio de Janeiro is largely responsible for generating high-paying jobs, which allows us to increase demand in other markets not directly associated with it, in addition to fundamentally contributing to the collection of taxes and allowing realising investments in infrastructure and the most varied social actions.

This complex market, full of new challenges, makes us leave our comfort zone and seek solutions to keep mitigating its risks, while taking advantage of its benefits.

Thus, the **Rio de Janeiro Oil Industry Yearbook**, now in its third edition, presents analyses of the most relevant oil opportunities, challenges and data, up to the year 2017, and prospects for 2018. Resulting from the effort of **Sistema FIRJAN**, this year, with the support of JLT to concretize the project, to show the representativeness of this Rio de Janeiro market in the Brazilian economy, the document offers the reader access to qualified information that allows companies to guide their investment decisions and base the composition of their business plans.

The Yearbook thus allows us to observe the trends of this market, the most relevant being the opportunities to expand the activities of companies, whether focused on exploration and production of oil, or on the segment of refining and distribution of derivatives.

As in the previous year, the **Rio de Janeiro Oil Industry Yearbook – Overview 2018** was constructed based mainly on data widely disseminated by **Brazilian National Agency of Petroleum, Natural Gas and Biofuels – ANP**. While international data was obtained from the ***U.S Energy Information Administration* – EIA**, and from the oil company **BP**, which operates internationally and also provides market data.

For the analyses of this market's situation and prospects, the Yearbook had the collaboration of renowned organizations, adding even more value and legitimacy to its content. Considering the globalization of this business, initially, the document offers a reading of the world and national context of the oil market, built by the **Brazilian Petroleum, Gas and Biofuels Institute – IBP**, as well as an article about **Petrobras**' new contracting model written by the company itself.

The rest of the document is structured following the logic of this industry's value chain. For the first chapter, which deals with activities related to the Exploration and Production segment, the Yearbook includes the participation of **Total** and **BP**, as well as an article on decommissioning written by **JLT**.

The Downstream data is presented in the second chapter, comprising the activities of refining and distribution of oil and its derivatives. **Plural**, evaluated the main challenges of this segment in Brazil and Rio de Janeiro.

For this edition, the third chapter that presents the information on the investments coming from the resources research, development and innovation clause, the **Brazilian Development Bank – BNDES**, presented its vision of how this tool can be enhanced to maximize results.

Lastly, the fourth chapter presents the detailed analysis of the **Sistema FIRJAN** on the oil job market with a focus on Rio de Janeiro.

The **Rio de Janeiro Oil Industry Yearbook – Overview 2018** presents a qualified evaluation of the market, evidencing the participation of the state in the national scenario, with analysis presented in the Final Considerations. The full document can be accessed on Sistema FIRJAN webpage, in the Oil, Gas and Naval environment: **www.firjan.com.br/oilandgas**

SUMMARY

CONTEXT

The window of opportunities for the Brazilian oil industry

IBP's article

The energy sector is undergoing a deep transformation towards a low carbon economy, with the increase of renewable fuels in the global energy matrix and the commitment of countries at COP 21 to reduce CO_2 emissions.

In this context, the Brazilian nation cannot lose this window of opportunity to convert and maximize our oil and gas reserves in collection, jobs and wealth for the country. In light of this scenario, we must rethink our sector and adapt to the changes that are inexorable. It is up to Brazil to keep up with the accelerated pace of changes.

Our great challenge this year is to show society the great relevance of the oil and gas industry to the country and its significant impact on the Brazilian economy, on the generation of employment and income, technological advancements, development of people, and social inclusion. Oil and gas are present in medicine, sports, cosmetics, packaging, in all household appliances, electronic equipment and are felt daily in people's lives.

This understanding is paramount in this moment of discussion of the country's future. The long-term sustainability of this industry depends on constant and consistent activity. We cannot repeat the crisis that set in after the peak of activity in 2012, when we wasted human resources, materials and investments in innovation and technology. Our reserves ensure decades of excellent exploration and production projects that will be the engine of a new window of oil and gas activities in Brazil.

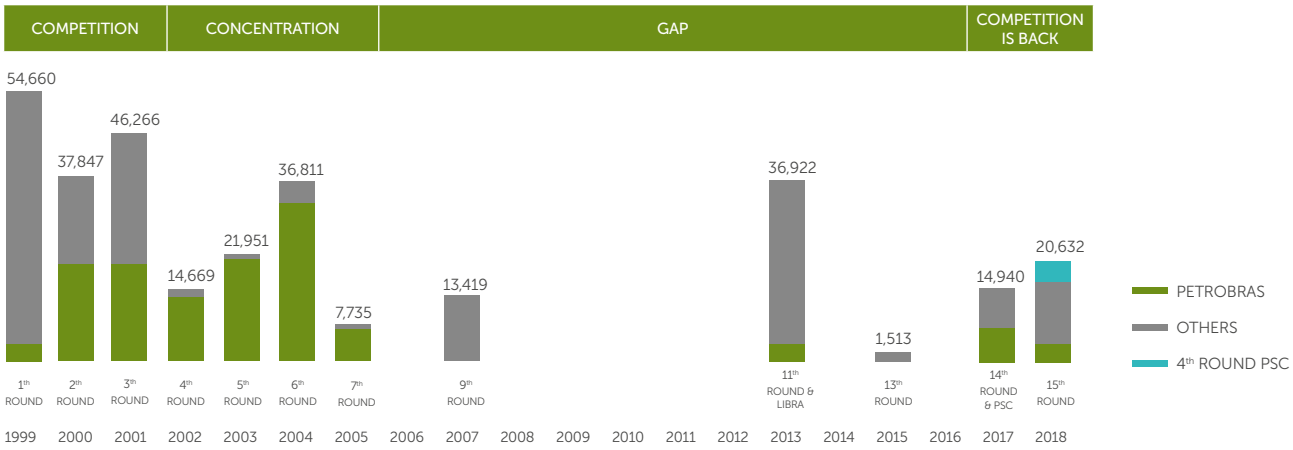
It is essential to make progress in the competitiveness of our industry. The discovery of American shale oil has revolutionized the global market as it offers an alternative of fast increase in production. Thus, shale enters as a downward regulator in the high price phases. This advent brought the low for long thesis – lower prices for a longer period. It is therefore paramount to focus on efficiency and operate at low cost to keep pre-salt competitive, viable and profitable at prices around US$ 40 a barrel.

After a period of absence of activities, the new rounds are building a new wave of exploratory activity that will come almost in tune for all E&P players (oil companies and suppliers). In this context, the future of local content needs to be debated and we have to plan to advance in technology and prepare for the increase in demand when the fields auctioned in the last bidding rounds enter into development. We have an opportunity to plan, a period between five and seven years, where best practices and the search for the vocational content of this industry – with more innovation and technology – should ensure that we will be able to meet future demand.

Demand that, according to the BNDES, only the oil and gas sector corresponds to more than 50% of the investments between 2017 and 2020, with the investment forecast of R$ 182 billion in that period.

The bottlenecks have already begun to be faced. In the last two years, ANP and MME (among other government agents) made a significant endeavor to, with great effort, dialogue and coordination with the industry, solve important issues, and which have allowed more competition in the industry.

FIGURE 1. AREA PER OPERATOR (THOU KM²)



Last update April/2018

Note: 8th Round canceled, no offer of offshore areas in the 10th e 12th Rounds.

Source: IBP with ANP data.

We are in a new moment when the activity of exploration and production must be resumed, and all the agents of the industry start from the same starting point. That is, we are all together and in the same moment of demand.

Brazil has geographical barriers that encourage the national production of goods and services. Combined with this, the country has strong activity and great opportunities in the oil and gas segment. That is, local content is vocational in Brazil, all the actors involved seek to develop projects with local companies. We need only to find the best way to make this viable. The window is open.

The new Petrobras new contracting model

Petrobras's article

Sanctioned in June 2016, the Law of State-Owned Companies represents a regulatory framework for public companies, mixed-capital companies and their subsidiaries in all spheres.

Passed in June 30, 2016, Law 13303 provides for the legal statute of public companies, mixed capital companies and their subsidiaries, within the Union, the States, the Federal District and the Municipalities. Known as Law of State-owned Companies, it represents a regulatory framework for the performance of these companies, including Petrobras and its Brazilian subsidiaries, with the establishment of new procedures and responsibilities.

One of the main themes presented by the law is the regulation of contracting, with changes and innovations in relation to the standards previously adopted by the company – Decree nº 2745/98 and Petrobras Contracting Manual (MPC). It is important to note that the new law revoked article 67 of Law nº 9478/97, the basis for application of Decree nº 2745/98 by Petrobras.

Timeline

Article 40 of the Law of State-owned Companies determined that all companies affected by the new legislation should publish and keep their up to date their internal regulation of bids and contracts. And, on January 15, 2018, Petrobras published its Regulation of Bids and Contracts (RLCP) in the Federal Official Gazette.

RLCP provided for the implementation of Law nº 13303/16 by organizational units. Thus, to test all the infrastructure of systems created to meet the new requirements and the training process of all those involved in the contracting of goods and services in the company, two pilot projects were carried out.

The first pilot was started on February 5 at the Exploration and Production Operations Unit of Espírito Santo. The second pilot was held at the Operations Unit of Rio de Janeiro, as of April 2. The turning point, with the implementation of all new procedures in the other units of the company, occurred on May 15th.

Changes in the contracting process

The Law of State-owned Companies establishes that contracting must be carried out, as a rule, through public bidding, that is, open to any interested party that is able to meet the RFP's conditions.

Since the turn of the key, all of Petrobras' public bids are published in the Petronect procurement and contracting portal (www.petronect.com.br) and the Federal Official Gazette (DOU). And, among the main changes brought about by the Law of State-Owned Companies, note that there are no longer the modalities of Invitation, Pricing, Competition, Tender and Auction.

Now, the bids are processed preferably electronically, with the following procedures: open, closed or combined dispute modes, and the trading floor ritual.

There are other changes brought about by the new law: the qualification of the best classified bidder happens at the end of the process, after the negotiation – which is a mandatory phase; the referential budget is the limit, that is, it is not possible to contract above the budget and the bid will be revoked if the negotiation is not successful; there is only one resource phase and it occurs after the qualification.

Suppliers: registration and pre-qualification

The Law of State-owned Companies also provides for auxiliary and pre-bidding procedures, such as registration and permanent pre-qualification. Petrobras already has a database of suppliers of goods and services, a database that gathers the information of its service providers and suppliers of goods, in order to allow pre-evaluation of the companies.

The registration is done in a computerized system available on the Petronect website, where the general rules of the Registration are found. It is permanently open to interested parties and is valid for qualification purposes for up to one year and can be updated at any time.

With the implementation of Law nº 13303/16, the registration becomes more important. The qualification requirements in the RFP may be totally or partially replaced by the

Cadastral Registration Certificate (CRC). The CRC will be complete when it meets all the qualification parameters defined in article 58 of Law nº 13303/16, and partial when it meets at least one of them, without detriment to other information required by Petrobras.

The permanent pre-qualification, another auxiliary procedure brought by Law nº 13303/16, can be used when the object of the bidding requires a more detailed technical analysis. It aims to make the contracting process more agile, since the evaluation of technical qualification requirements will occur in advance and not during the bidding process. In any case, equal conditions between competitors will be ensured.

The pre-qualifications are public and are permanently open to the registration of any interested party. They are posted on the Petronect portal by means of calls, which provide the rules for participation and the requirements for companies to qualify to provide goods or services for the company.

Conditions and participation

Also to meet the changes caused by Law nº 13303/16, the Material Supply Conditions (CFM 2018) were updated and disclosed to the supply market. This document regulates the supply of goods and services associated with Petrobras.

For Petrobras, the participation of suppliers in this deep process of change is fundamental. Therefore, several meetings were held with the presence of companies, associations and class entities. So far, there have been 25 forums, with registrations of about 2,650 companies.

An exclusive space was also created on the Petrobras website, with all the information about the new contracting rules. To know it, just access **http://contratacao.petrobras.com.br.**

Charts

CHART 1. WTI AND BRENT OIL PRICE EVOLUTION

Source: EIA, 2018.

CHART 2. HISTORY OF PROVEN RESERVES AND WORLD OIL PRODUCTION

Source: BP Statistical Review e ANP, 2018.

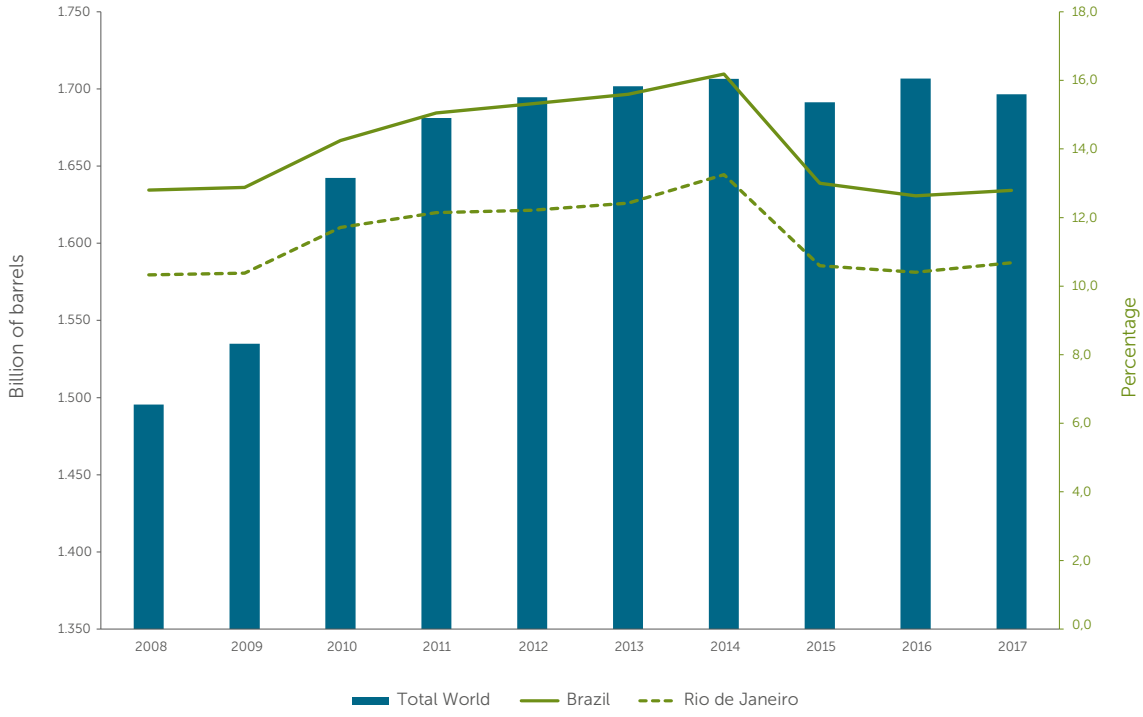


CHART 3. HISTORY OF WORLD OIL PRODUCTION

Source: BP Statistical Review and ANP, 2018.

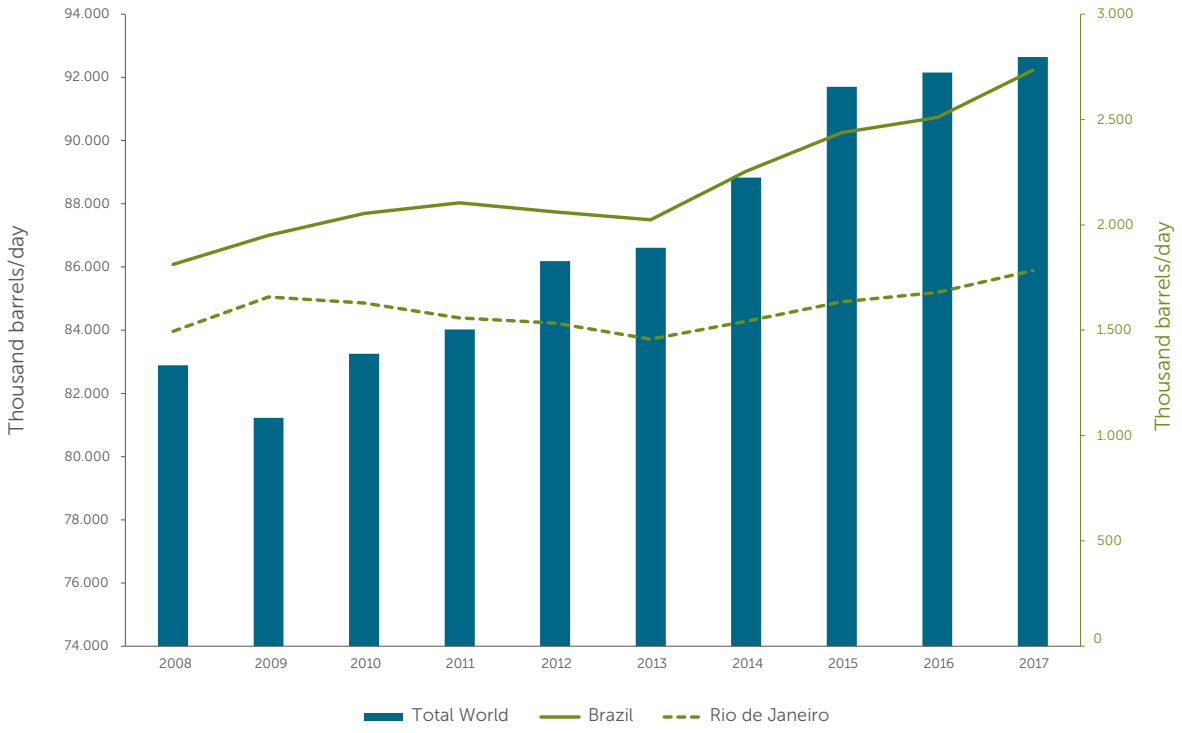


CHART 4. EVOLUTION OF THE WORLD REFINEMENT CAPACITY

Source: BP Statistical Review, MME and ANP, 2018.

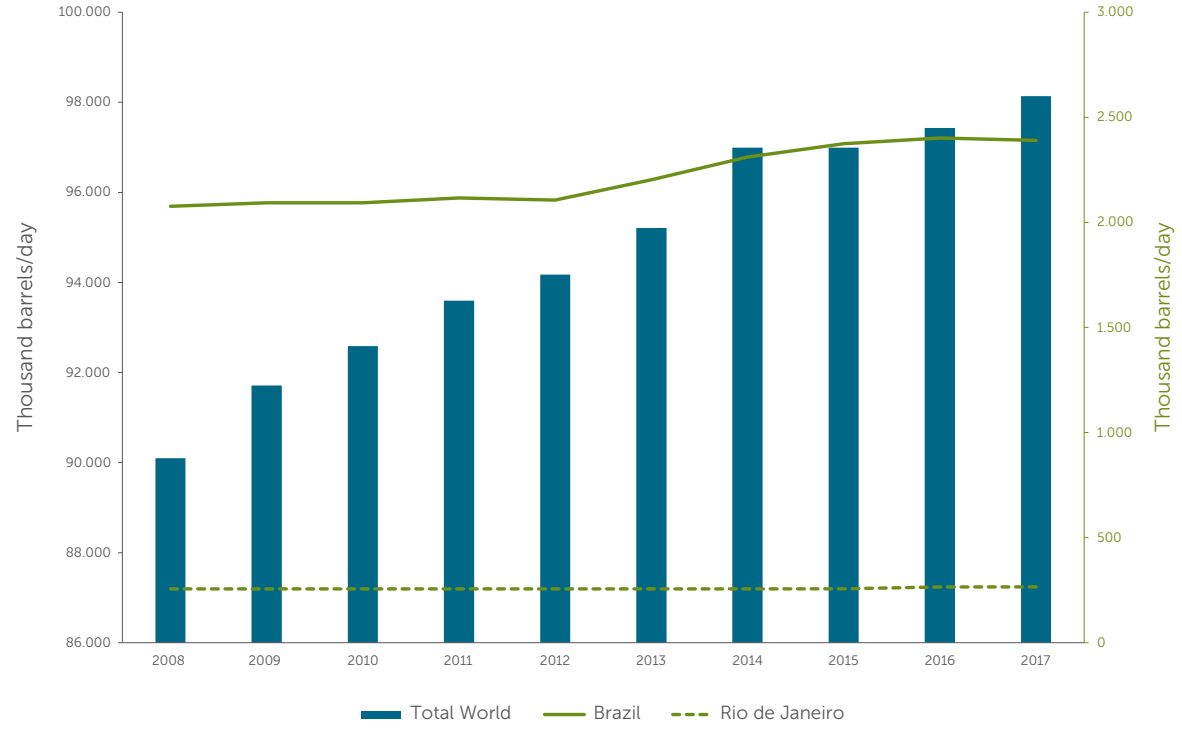


CHART 5. HISTORY OF REFINED OIL VOLUME WORLDWIDE

Source: BP Statistical Review and ANP, 2018.

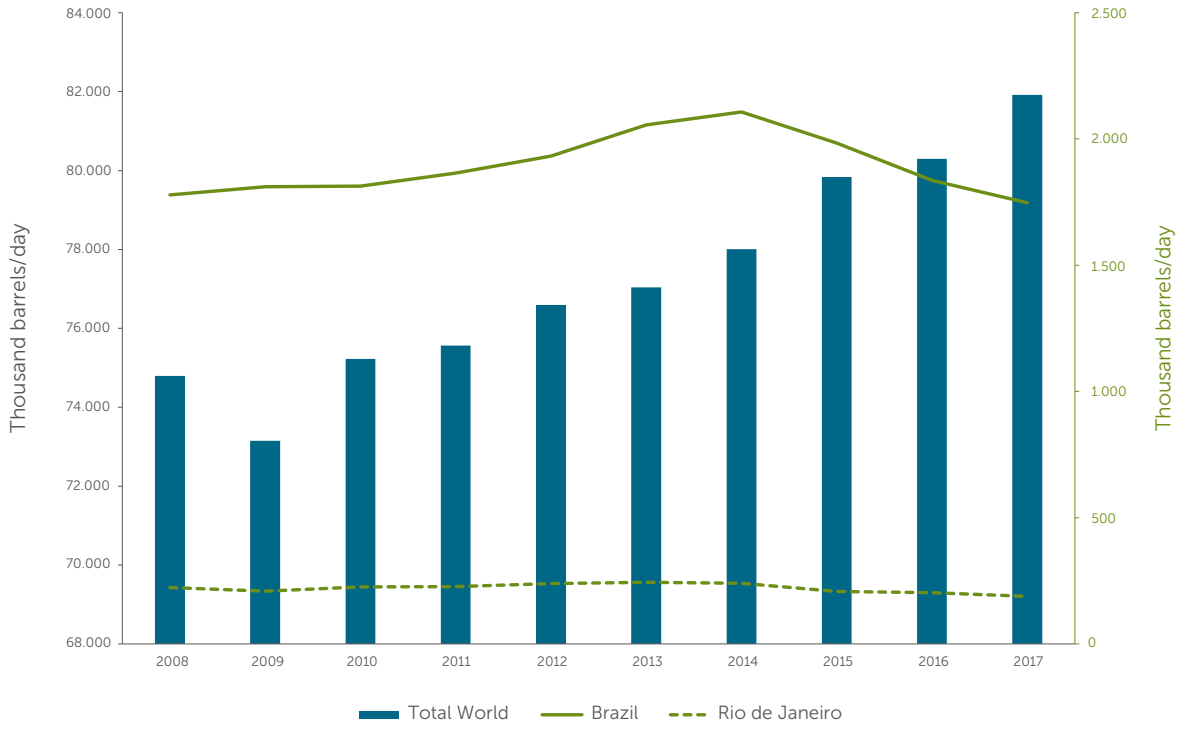


CHART 6. HISTORY OF WORLD OIL CONSUMPTION

Source: BP Statistical Review and ANP, 2018.

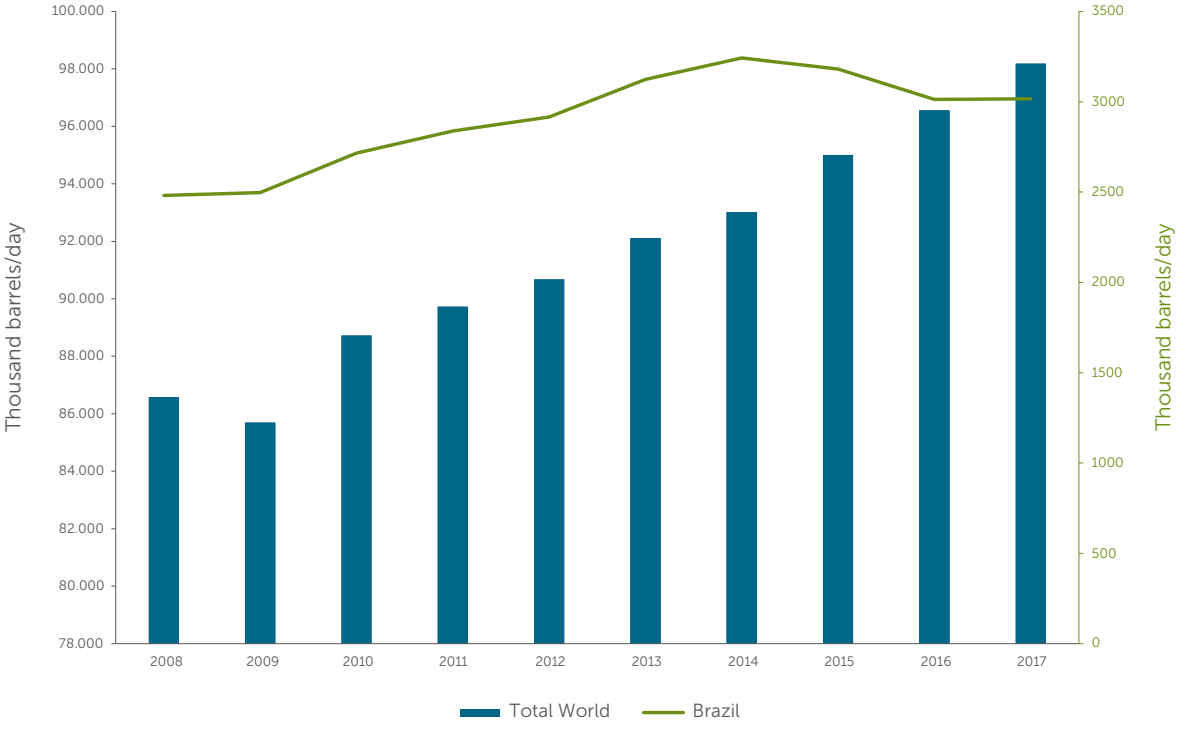


CHART 7. PARTICIPATION BY TYPE OF FUEL IN THE WORLD ENERGY CONSUMPTION
Source: BP Statistical Review, 2018.

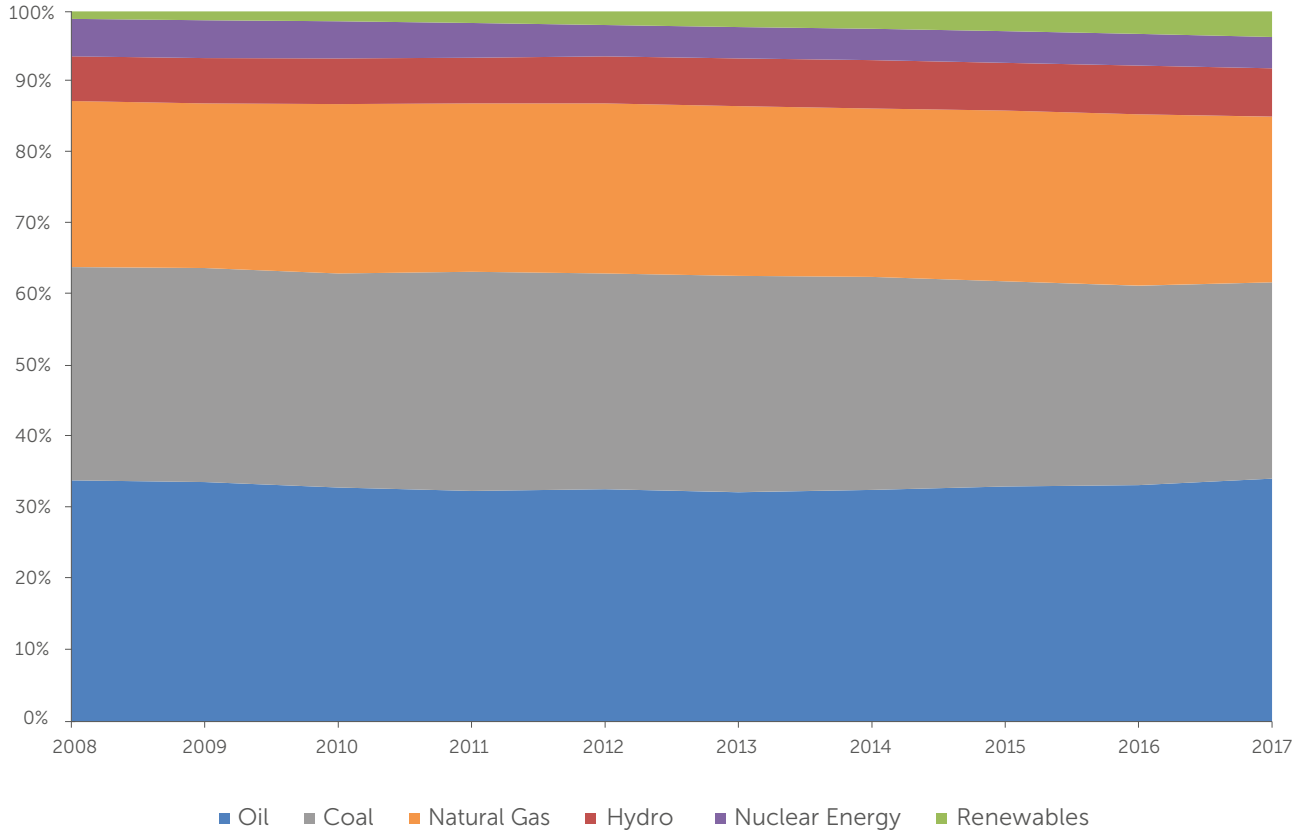
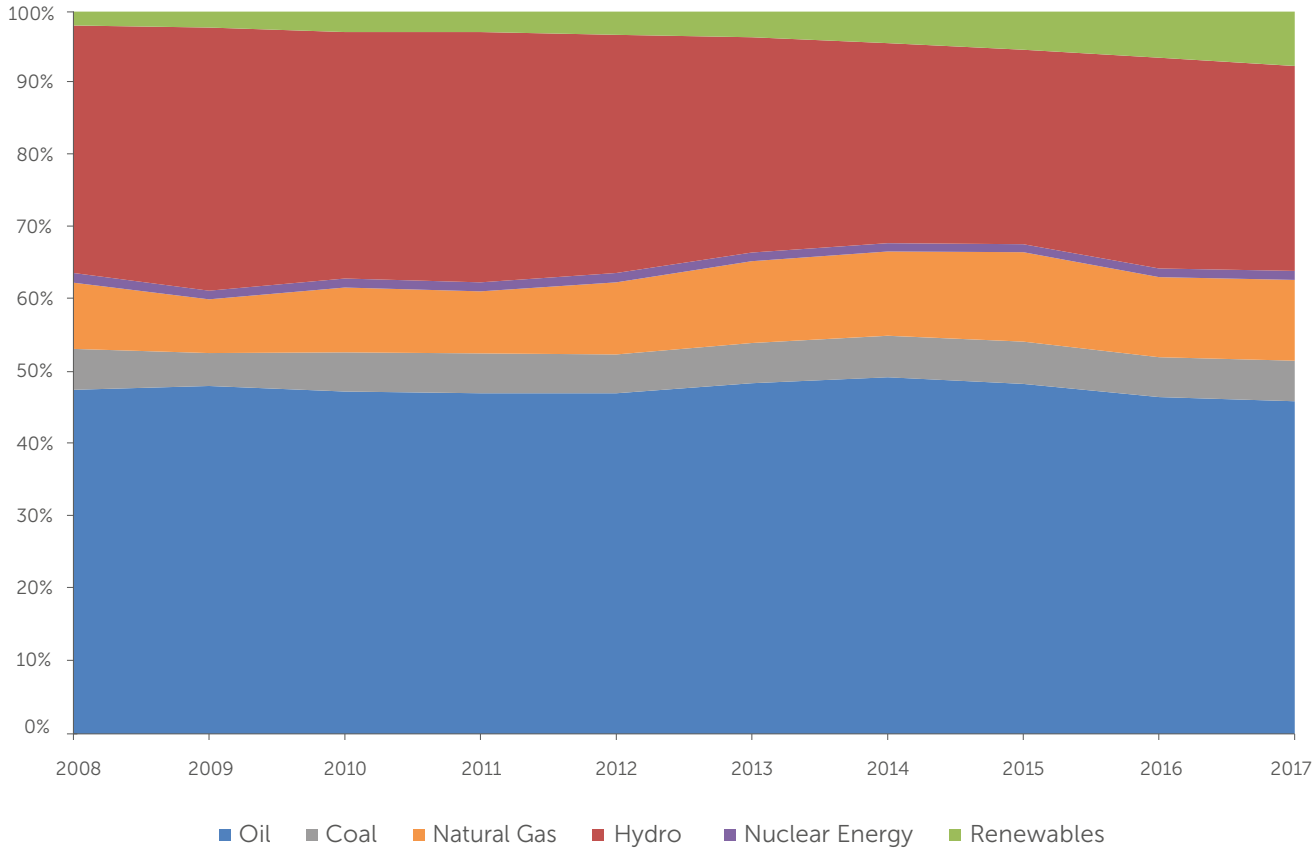


CHART 8. PARTICIPATION BY TYPE OF FUEL IN BRAZIL'S ENERGY CONSUMPTION
Source: BP Statistical Review, 2018.



CHAPTER 1

EXPLORATION & PRODUCTION

Brazil and Rio de Janeiro in the world context of Oil

BP's article

Brazil has in Pre-Salt a considerable potential of reserves with unique geological characteristics, which has become competitive as a result of the regulatory changes that are taking place. We are pleased to note the recent changes in the Brazilian oil sector and the open dialogue established with the industry, which is reflected in the excellent results of the latest bidding rounds.

The resumption of ANP auctions allowed the access of international companies in the exploration of pre-salt blocks, under the model of production sharing contracts, mostly blocks located in the maritime area of the State of Rio de Janeiro, which stands out as a promising region in the view of major world oil companies. Regarding the investment conditions, BP was encouraged by the recent regulatory reviews, in addition to the permission for other companies, in addition to Petrobras, to operate blocks in the Pre-Salt, especially with regard to the extension of REPETRO [Special Customs Regime for the Export and Import of goods destined for the exploration and production of oil and natural gas] and flexibility of the rules for Local Content, among other changes.

BP is focused on results that bring benefits to the Brazilian government, to society and to BP itself, and encourages the Brazilian government to ensure that the terms and conditions in the country are competitive with those in other regions, in order to attract the interest of other companies and operators with global experience in ultra-deep waters.

In the 3rd ANP Production Sharing Round, in October 2017, BP jointly with Petrobras, acquired a 50% interest in the Alto de Cabo Frio Central block, and 40% in the Peroba block, also in partnership with Petrobras and CNODC, both blocks located primarily in the Rio de Janeiro State region, areas for which the company has high expectations. In the 15th Bidding Round, held in March 2018, in a consortium with Statoil (Equinor since May 16, 2018), BP purchased the C-M-755 and C-M-793 blocks in ultra-deep waters of the Campos Basin, with a bonus payment of over R$ 43 million for each block.

The excellent results of the last ANP Bidding Rounds show that Brazil has once again attracted foreign investments, which had been dammed in recent years due to the drop in oil prices and national and international political and economic context.

BP also sees gas production as an opportunity for the country, which has shown organic and inorganic growth in its natural gas market. Also in this segment, BP has a strategic partnership with Petrobras, which may include possible asset swaps.

This is an exciting moment for the Exploration and Production (E&P) segment in Brazil, which has advanced a lot in the last two years, and having a long-term partnership with Petrobras, known for its ability to operate in deep- and ultra-deepwater, is a positive increment. BP knows Petrobras well, the companies are already working together in 16 exploration blocks, which means that they can use shared experience and technology to assess mutual opportunities; thus, seeing great potential – particularly in deep and ultra-deep water operating environments – to adopt new technologies and support mutual goals.

However, note that the industry prefers simplification. Companies and the government need to improve regulatory models by promoting the adoption of new technologies, making Pre-Salt and other exploration opportunities even more competitive in the international context.

Given the volatile environment of oil prices and limited capital investment capacity in the sector, some of the key factors for progress in this field require greater flexibility to meet Local Content requirements in different categories, even because the coexistence of different tax regimes (production sharing, concession and onerous assignment) for the same accumulation tends to reduce competitiveness and increase the complexity of opportunities.

The improved flexibility of local content is unlocking several projects, which will bring greater economic activity in the oil and gas sector, generating more jobs, income and revenue for the State of Rio de Janeiro and for the Country. BP supports measures that are being evaluated and can evolve into regulatory implementations, such as:

a) a mechanism for local content that prioritizes incentives rather than penalties;

b) creation of a local content rule that allows operators that exceed the commitments to use local suppliers to transfer local content credits to other phases of the project and even to other companies (in the case of integrated companies);

c) local content credits for operators that contract services from Brazilian suppliers outside Brazil.

The geology of the Brazilian Pre-Salt is special, but it is necessary to combine the attractiveness of its geological potential with the competitiveness in the non-geological context. More important still, it should not be forgotten that the pre-salt projects aim at the next 40 years. Therefore, to keep it in the spotlight, we must capitalize on it right now by building, with zeal and responsibility, the foundations for the benefit of future generations."

Local growth from a global strategic vision

Total's article

Oil and natural gas are key to development and will continue to play an important role in the coming decades. According to the International Energy Agency, these sources will still represent more than 40% of the primary energy matrix in 2035. It is therefore unrealistic to think about an abrupt transition. Instead, you have to look at the sector from a new perspective.

The Brazilian oil industry is experiencing a moment of recovery, generating optimism regarding the increase in investments and exploratory activity and the prospects for increased oil and gas production in the country. Although the oil window has shortened from the global discussions around a low carbon energy matrix, and the sector needs to develop a sense of urgency, the message that remains for Brazil is positive. Today, the national oil and gas segment has the largest window of opportunity in years, given the recent changes that have allowed a new strategic vision of this industry.

Today, as the new structure of the sector is taking shape, the union of the agents involved becomes even more necessary, so that an attractive and powerful industry of the future can be designed. According to the Brazilian Development Bank (BNDES), the prospect of investment for the Brazilian industry between the years 2017 and 2020 is about R$ 480 billion. The oil and gas market would represent more than 50% of this total, reinforcing the positive signs observed in recent months – such as the success of the ANP rounds, the extension of Repetro and the advances in local content rules.

To unlock this investment potential, the Brazilian oil industry needs to consolidate and maintain international interest, guaranteeing growth prospects and job creation in the sector, necessary for economic recovery, especially in Rio de Janeiro, as the sector's capital in Brazil. That way, the industry needs to tackle important challenges in order to further boost the segment.

Greater objectivity and faster processes mean more security and predictability for companies to work and manage their investments in Brazil – especially in a sector where planning is always long-term. Measures such as the establishment of a fixed schedule of rounds, which allow companies to be more strategic and assertive in their business decisions, are important advances. However, there are still challenges for the consolidation of the sector, such as the environmental licensing process, fiscal complexity, the incentive to invest in mature fields and the adhesion of the State of Rio to Repetro. It is also important for the government and companies to develop Brazil's onshore oil potential, whether conventional or low-permeability reservoirs, which can open new growth fronts for the industry.

The Brazilian business environment favors the exchange of experiences, discussions of high added value and cooperation in research and technology between partner companies – factors that contribute to generate lasting business opportunities. The Brazilian supply chain can also benefit from this exchange and the expertise of international companies to boost local content through innovation and R&D initiatives. Such initiatives should be worked jointly between companies to generate concrete and effective results. It is also fundamental that the government promote a positive agenda to develop the national supply chain, encouraging the Brazilian business community to grow and export. The country has the potential to export goods and services to countries around the world that can widen the horizons of its local industry and ensure greater resilience in times of crisis.

Brazil is an important region for the global growth strategy of the Total Group. For us, the potential of Brazilian reserves, the large volume of natural resources and the prospects of the local consumer market, as well as the recognized expertise of national professionals, are attractive for the development of our businesses.

In recent years, we have expanded our portfolio in the country, focusing on opportunities where we can operate in one of our core expertise: deepwater assets. In the first round of the ANP Production Sharing Model, we became partners in the Libra consortium, in the Santos Basin pre-salt, one of the most promising areas in the world. This year, we took over the operation of the Lapa field, also in the Santos Basin, making us the first international company to operate a field in production in the Brazilian pre-salt, demonstrating our long-term commitment to Brazil. As part of this expansion, we plan to invest R$ 3 billion per year in the country in the coming years.

Finally, it is important to highlight that the energy transition should be perceived as an opportunity for growth by companies in the sector. Total has been adjusting its global business strategy to meet the 2 °C scenario of the International Energy Agency, with a commitment to have 20% of its portfolio consisting of low-carbon energy by 2040. In this transition scenario, natural gas plays a fundamental role, replacing coal more and more in the energy matrix. Total is one of the big-

gest players in liquefied natural gas (LNG) and has been investing in natural gas for the generation of electricity. Brazil has great potential in this sector, it being essential to implement adequate regulations that allow the development of the domestic gas market and free access to this market by the producers. This will allow the development of new resources and of the local industry, promoting access to cheaper and cleaner energy for consumers.

Decommissioning: an urgent discussion

JLT's article

Decommissioning is the end of the life cycle of an oil well, when it is returned in its original condition, free of environmental damages. In recent years, however, there have been frequent discussions in the world about this process in offshore areas and the environmental impacts associated with the abandonment of offshore platforms. Brazil is no exception to the rule, but it is urgent to speed up regulatory definitions that involve and permeate the subject. There are many obstacles related to environmental issues to be overcome before the country is ready, with clear rules, to begin decommissioning activities. The debate involves not only the industry and regulatory bodies, but also the insurance market, which can contribute to the solution of various problems.

The reduced number of offshore projects discontinued by the middle of this decade and the low cost of demobilizing onshore infrastructures may explain the industry's lack of interest in planning the decommissioning activity. The scenario has changed, however, from the Brent Spar case in the North Sea. Although legislation allows for the sinking of the unit, protests led by environmentalists caused a review in the plans and the offshore unit was taken to the ground and dismantled, which induced the producing countries to see the need to create specific norms to regulate the process. Add to this the economic impact of the increase in the number of projects reaching the end of their cycle in the Gulf of Mexico and the North Sea.

At the end of the 1990s, it was estimated that approximately 50 units installed in the North Sea were decommissioned. However, new technologies have prolonged the productive life of the oil fields. Currently, it is estimated that over the next 30 years, in the North Sea alone, more than 470 platforms, 10,000 km of pipelines and 5,000 wells should be decommissioned at an estimated cost of GBP 40 Bn.

Several countries, such as the United Kingdom, United States, Canada and Norway already have advanced rules and regulations governing the demobilization operation. Financial responsibilities and continued liability of operators are already foreseen in all these countries. The obligation to completely remove the equipment is part of the North American legislation and the Convention for the protection of the marine environment in the North Atlantic, in the case of the United Kingdom and Norway.

In Brazil, where the process of demobilization of offshore platforms is recent, the request of approximately 30 decommissioning is expected in the coming years. A conglomerate of norms establishes the guidelines for this phase, but still with several uncertainties, mainly involving environmental issues. These standards already establish that the scope of the activity must be subjected to the approval of the Brazilian National Agency of Petroleum, Natural Gas and Biofuels (ANP) 180 days before the end of the production period.

From the 14th Bidding Round, in September 2017, the Agency started to demand from the operators, at the signing of the concession agreement, financial guarantees to decommission the project at the end of its service life. However, it is difficult to properly assess the risks and costs that will be involved 20 or 30 years from now in an industry that is technologically evolving at a fast pace each day. In the Brazilian case, where the projects are mostly in deep waters, the challenge is even greater.

Although exploration and production (E&P) activity is largely dominated by the insurance market, the decommissioning process still raises doubts about the risks involved. To mention only a few: the difficulty of removing large concrete structures, submarine lines and aquatic equipment, and the possible need to use new technologies; climate change during the disassembly and hoisting process; and the navigation and anchoring of ships near large structures.

Some risks are already properly mapped, such as falls and physical damage of reusable equipment in the process of disassembly and removal, damage to third parties and pollution caused by the well closure process. In general terms, insurers provide insurance coverage for physical damage to equipment during the decommissioning process, except for the asset being dismantled. Also object of the insurance is the civil liability for damages caused to third parties during this activity.

However, just as in the oil and gas industry, the subject of environmental risk is also an agenda in the main debates of the sector. What insured limit should the operating company hire? What is the cost of insurance to guarantee a risk that is difficult to measure? What are the risks involved? Possibly, these doubts will find answers as the discussions between the main regulatory agencies also evolve.

Countries where the regulation of the process is more advanced offer greater risk retention capacity by the insurers. Consequently, they have greater competition and lower prices. The inverse is also true. The question is how to advance local discussions in this regard. Just as mandatory decommissioning should generate demand for new

technologies that facilitate the removal of equipment from the seabed, it is necessary to see how insurers evaluate the possibility of guaranteeing operations with prototypes. In the same vein, it will be necessary to evaluate insurance coverage for reused equipment. These are still unanswered questions.

Brazil has technical capacity and counts on experiences of countries already evolved in the regulation of the process of decommissioning. We need to continue the discussions here in the country, so that we are ready, with clear regulations, when the first disassembly begins. Regulatory bodies need to be mobilized for this purpose.

Charts and tables

CHART 9. PROVEN RESERVES IN RIO DE JANEIRO

Source: ANP, 2018.

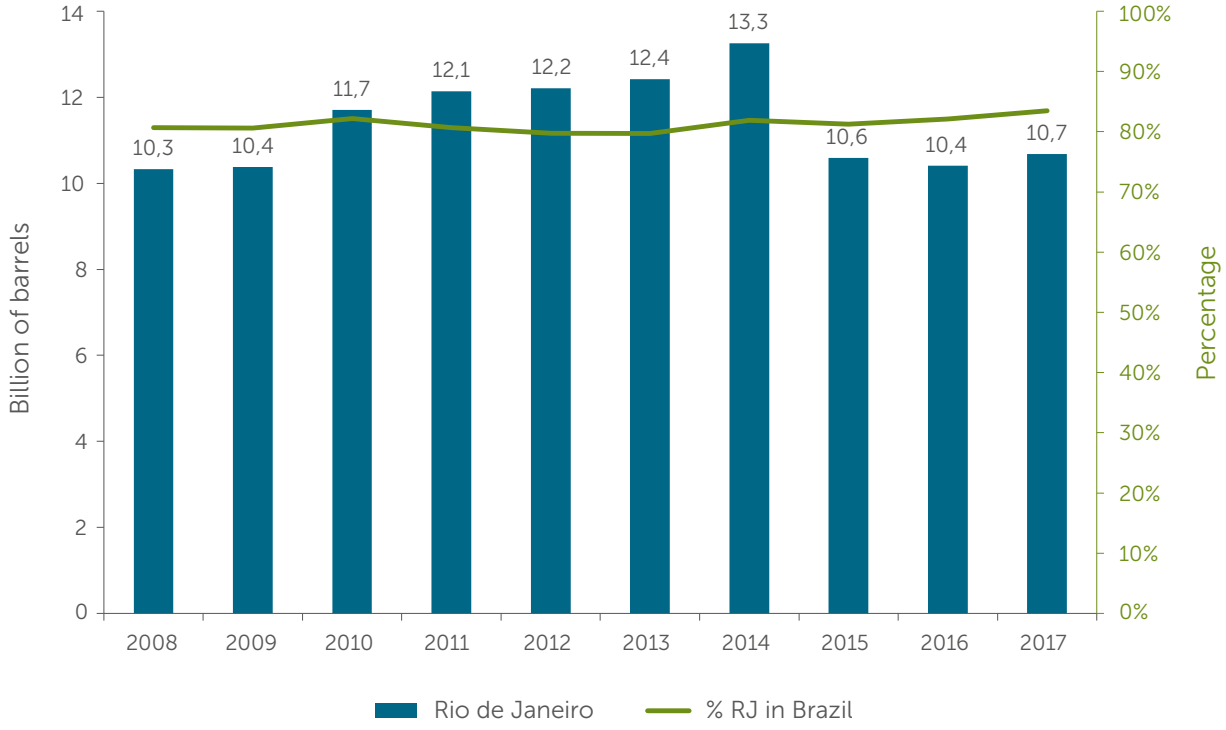


CHART 10. PROBABLE AND POSSIBLE RESERVES IN RIO DE JANEIRO

Source:ANP, 2018.

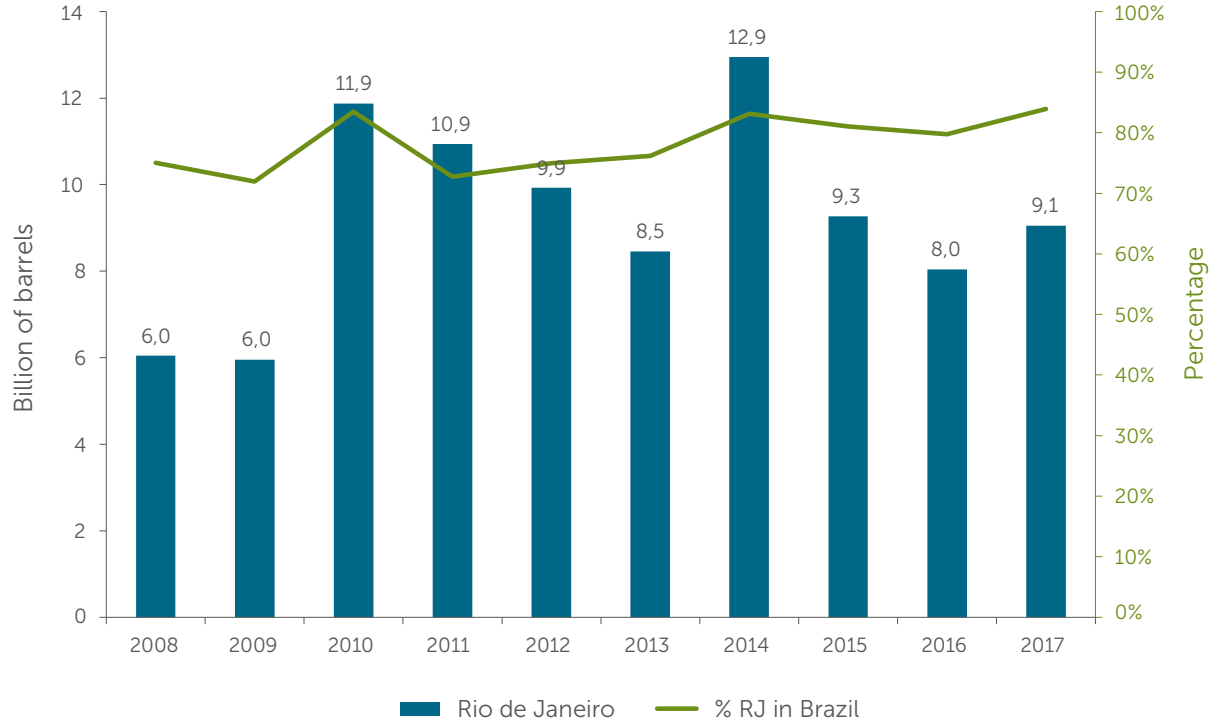


TABELA 1. PRODUCTION FIELDS UNDER CONCESSION IN RIO DE JANEIRO (DEC/2018)
Source: ANP, 2018.

BASIN	FIELD/ BLOCK	OIL PRODUCTION IN 2017 (BARRELS/ DAY)	OPERATOR	% OP	PARTNER 1	% PARTNER 1	PARTNER 2	% PARTNER 2
Campos	ALBACORA	2.917.862	Petrobras	100%				
Campos	ALBACORA LESTE	2.864.326	Petrobras	90%	Repsol Sinopec	10%		
Campos	ANEQUIM	32.724	Petrobras	100%				
Campos	BADEJO	0	Petrobras	100%				
Campos	BAGRE	6.482	Petrobras	100%				
Campos	BARRACUDA	2.932.601	Petrobras	100%				
Campos	BICUDO	0	Petrobras	100%				
Campos	BIJUPIRÁ	544.274	Shell Brazil	80%	Petrobras	20%		
Campos	BONITO	232.710	Petrobras	100%				
Campos	CARAPEBA	399.037	Petrobras	100%				
Campos	CARATINGA	1.706.861	Petrobras	100%				
Campos	CHERNE	485.717	Petrobras	100%				
Campos	CONGRO	79.142	Petrobras	100%				
Campos	CORVINA	58.651	Petrobras	100%				
Campos	ENCHOVA	151.746	Petrobras	100%				
Campos	ENCHOVA OESTE	143.326	Petrobras	100%				
Campos	ESPADARTE	148.728	Petrobras	100%				
Campos	FRADE	1.118.988	Chevron Frade	52%	Petrobras	30%	Frade	18%
Campos	GAROUPA	166.788	Petrobras	100%				
Campos	GAROUPINHA	14.130	Petrobras	100%				
Campos	LINGUADO	1.049	Petrobras	100%				
Campos	MALHADO	52.693	Petrobras	100%				
Campos	MARIMBÁ	773.352	Petrobras	100%				
Campos	MARLIM	8.205.467	Petrobras	100%				

TABLE 1 CONTINUED. PRODUCTION FIELDS UNDER CONCESSION IN RIO DE JANEIRO (DEC/2018)
Source: ANP, 2018.

BASIN	FIELD/ BLOCK	OIL PRODUCTION IN 2017 (BARRELS/ DAY)	OPERATOR	% OP	PARTNER 1	% PARTNER 1	PARTNER 2	% PARTNER 2
Campos	MARLIM LESTE	3.885.074	Petrobras	100%				
Campos	MARLIM SUL	9.563.091	Petrobras	100%				
Campos	NAMORADO	388.896	Petrobras	100%				
Campos	PAMPO	660.112	Petrobras	100%				
Campos	PAPA-TERRA	559.626	Petrobras	63%	Chevron Brazil	38%		
Campos	PARATI	12.884	Petrobras	100%				
Campos	PARGO	129.228	Petrobras	100%				
Campos	PEREGRINO	3.879.355	Statoil Bazil	60%	Sinochem Petróleo	40%		
Campos	PIRAÚNA	20.472	Petrobras	100%				
Campos	POLVO	453.503	PetroRio	100%				
Campos	RONCADOR	14.189.895	Petrobras	100%				
Campos	SALEMA	216.718	Shell Brazil	80%	Petrobras	20%		
Campos	TARTARUGA VERDE	592.662	Petrobras	100%				
Campos	TRILHA	0	Petrobras	100%				
Campos	TUBARÃO AZUL*	0	Dommo Energia	100%				
Campos	TUBARÃO MARTELO	388.294	Dommo Energia	100%				
Campos	VERMELHO	208.845	Petrobras	100%				
Campos	VIOLA	79.168	Petrobras	100%				
Campos	VOADOR	137.769	Petrobras	100%				
Santos	ATAPU**	0	Petrobras	100%				
Santos	BÚZIOS**	114.069	Petrobras	100%				
Santos	LULA	42.966.519	Petrobras	65%	Shell Brazil	25%	Petrogal Brazil	10%
Santos	TAMBAÚ	730	Petrobras	100%				
Santos	URUGUÁ	637.702	Petrobras	100%				

* In process of return.
** Onerous Assigment.

TABLE 2. DEVELOPMENT FIELDS UNDER CONCESSION IN RIO DE JANEIRO (DEC/2018)
Source: ANP, 2018.

BASIN	FIELD/ BLOCK	OPERATOR	% OP	PARTNER 1	% PARTNER 1	PARTNER 2	% PARTNER 2	PARTNER 3	% PARTNER 3
Campos	MAROMBA	Petrobras	70%	Chevron Brazil	30%				
Campos	PITANGOLA	Statoil Brazil	60%	Sinochem Petróleo	40%				
Campos	XERELETE	Total E&P Brazil	41%	Petrobras	41%	Energy Brazil	18%		
Campos	XERELETE SUL	Total E&P Brazil	50%	Petrobras	50%				
Santos	ATLANTA	Dommo Energia	40%	Queiroz Galvão	30%	Barra Energia	30%		
Santos	BERBIGÃO	Petrobras	65%	Shell Brazil	25%	Petrogal Brazil	10%		
Santos	ITAPU*	Petrobras	100%						
Santos	MERO**	Petrobras	40%	Shell Brazil	20%	Total E&P Brazil	20%	CNODC Brazil	10%
Santos	NORTE DE BERBIGÃO*	Petrobras	100%						
Santos	NORTE DE SURURU*	Petrobras	100%						
Santos	OESTE DE ATAPU	Petrobras	65%	Shell Brazil	25%	Petrogal Brazil	10%		
Santos	OLIVA	Dommo Energia	40%	Queiroz Galvão	30%	Barra Energia	30%		
Santos	SÉPIA*	Petrobras	100%						
Santos	SÉPIA LESTE	Petrobras	80%	Petrogal Brazil	20%				
Santos	SUL DE BERBIGÃO*	Petrobras	100%						
Santos	SUL DE LULA*	Petrobras	100%						
Santos	SUL DE SURURU*	Petrobras	100%						
Santos	SURURU	Petrobras	65%	Shell Brazil	25%	Petrogal Brazil	10%		
Santos	TAMBUATÁ	Petrobras	100%						

* Onerous Assigment.
** Percentage participation in the consortium for each one of the Companies.

TABLE 3. EXPLORATORY BLOCKS UNDER CONCESSION AND IN PRODUCTION SHARING REGIME

Source: ANP, 2018.

BASIN	FIELD/ BLOCK	ROUND	OPERATOR	% OP	PARTNER 1	% PARTNER 1	PARTNER 2	% PARTNER 2	PARTNER 3	% PARTNER 3
Campos	C-M-101	Round 6	Anadarko	30%	BP Energy Brazil	25%	IBV Brazil	20%		
Campos	C-M-401	Round 7	Petrobras	100%						
Campos	C-M-471	Round 7	BP Energy Brazil	50%	Petrobras	50%				
Campos	C-M-473	Round 7	BP Energy Brazil	50%	Petrobras	50%				
Campos	C-M-535	Round 7	Petrobras	65%	BP Energy Brazil	35%				
Campos	C-M-539	Round 7	Repsol Sinopec Brazil	35%	Statoil Brazil	35%	Petrobras			
Campos	C-M-61	Round 6	BP Energy Brazil	40%	Anadarko	33%	Maersk Energia Ltda.			
Campos	ALTO_CF_CE	Round 7	Petrobras	50%	BP Energy	50%				
Campos	C-M-210	Round 14	Petrobras	50%	ExxonMobil Brazil	50%				
Campos	C-M-277	Round 14	Petrobras	50%	ExxonMobil Brazil	50%				
Campos	C-M-344	Round 14	Petrobras	50%	ExxonMobil Brazil	50%				
Campos	C-M-346	Round 14	Petrobras	50%	ExxonMobil Brazil	50%				
Campos	C-M-37	Round 14	ExxonMobil Brazil	100%						
Campos	C-M-411	Round 14	Petrobras	50%	ExxonMobil Brazil	50%				
Campos	C-M-413	Round 14	Petrobras	50%	ExxonMobil Brazil	50%				
Campos	C-M-67	Round 14	ExxonMobil Brazil	100%						
Santos	BM-S-24	Round 3	Petrobras	80%	Petrogal Brazil	20%				
Santos	BM-S-8	Round 2	Statoil Brazil	66%	Petrogal Brazil	14%	Queiroz Galvão	10%		
Santos	Libra	Production Sharing	Petrobras	40%	Shell Brazil	20%	Total E&P Brazil	10%	CNODC Brazil	10%
Santos	S-M-1037	Round 9	Karoon	65%	Pacific Brazil	35%				

TABLE 3 CONTINUED. EXPLORATORY BLOCKS UNDER CONCESSION AND IN PRODUCTION SHARING REGIME

Source: ANP, 2018.

BASIN	FIELD/ BLOCK	ROUND	OPERATOR	% OP	PARTNER 1	% PARTNER 1	PARTNER 2	% PARTNER 2	PARTNER 3	% PARTNER 3
Santos	S-M-1101	Round 9	Karoon	65%	Pacific Brazil	35%				
Santos	S-M-1102	Round 9	Karoon	65%	Pacific Brazil	35%				
Santos	S-M-1165	Round 9	Karoon	65%	Pacific Brazil	35%				
Santos	S-M-1166	Round 9	Karoon	65%	Pacific Brazil	35%				
Santos	S-M-518	Round 7	Shell Brazil	80%	Total E&P Brazil	20%				
Santos	S-M-619	Round 7	Petrobras	80%	Repsol Sinopec Brazil	20%				
Santos	S-M-623	Round 7	Petrobras	60%	BG E&P Brazil	20%	Repsol Sinopec Brazil			
Santos	ALTO_ CF_O	Partilha 3	Shell Brazil	55%	CNOOC Petroleum	20%	QPI Brazil	25%		
Santos	ENT_ SAPINH	Partilha 2	Petrobras	45%	Shell Brazil	30%	Repsol Sinopec Brazil	25%		
Santos	N_ CARCARA	Partilha 2	Statoil Brazil	40%	Petrogal Brazil	20%	Exxon Mobil Brazil	40%		
Santos	PEROBA	Partilha 3	Petrobras	40%	CNODC Brazil	20%	BP Energy	40%		
Santos	S_GATO_ MAT	Partilha 2	Shell Brazil	80%	Total E&P Brazil	20%				
Santos	S-M-1537	Round 14	Karoon	100%						

CHART 11. HISTORY OF OIL PRODUCTION IN RIO DE JANEIRO

Source: ANP, 2018.

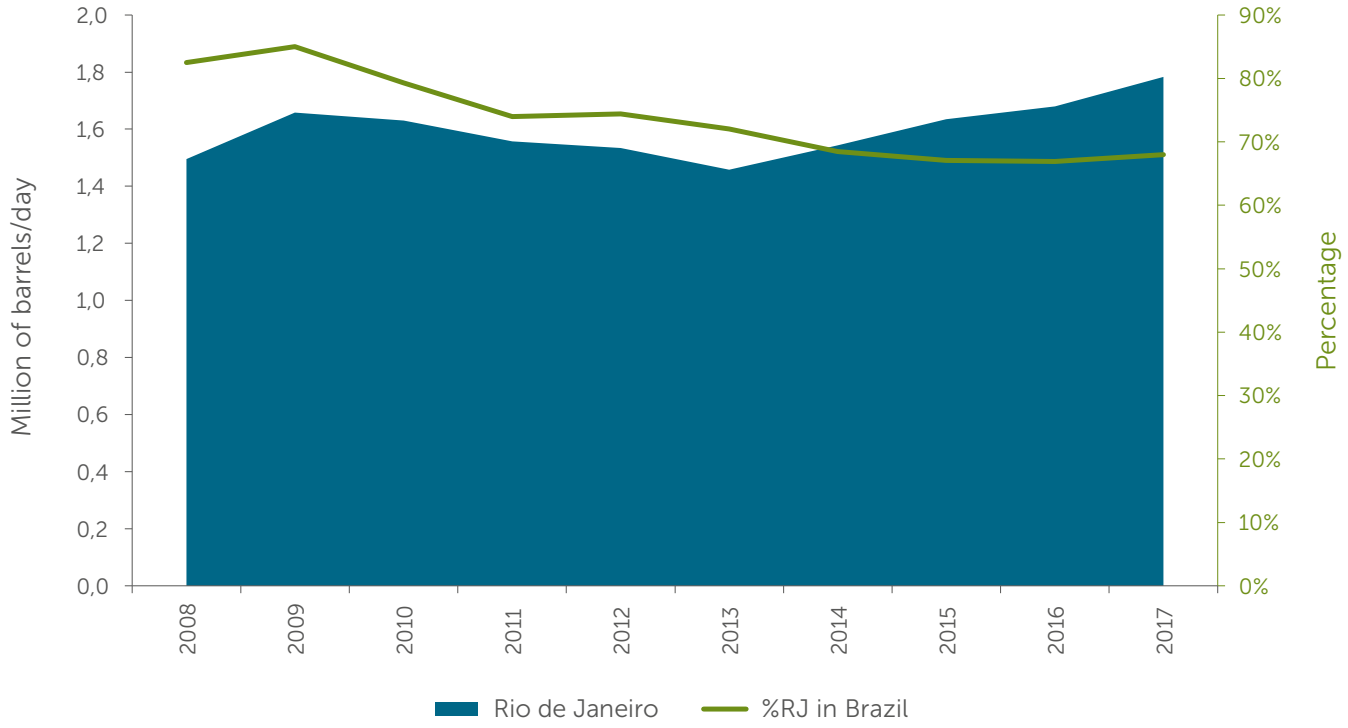


CHART 12. EVOLUTION OF PRE-SALT PRODUCTION IN RIO DE JANEIRO

Source: ANP, 2018.

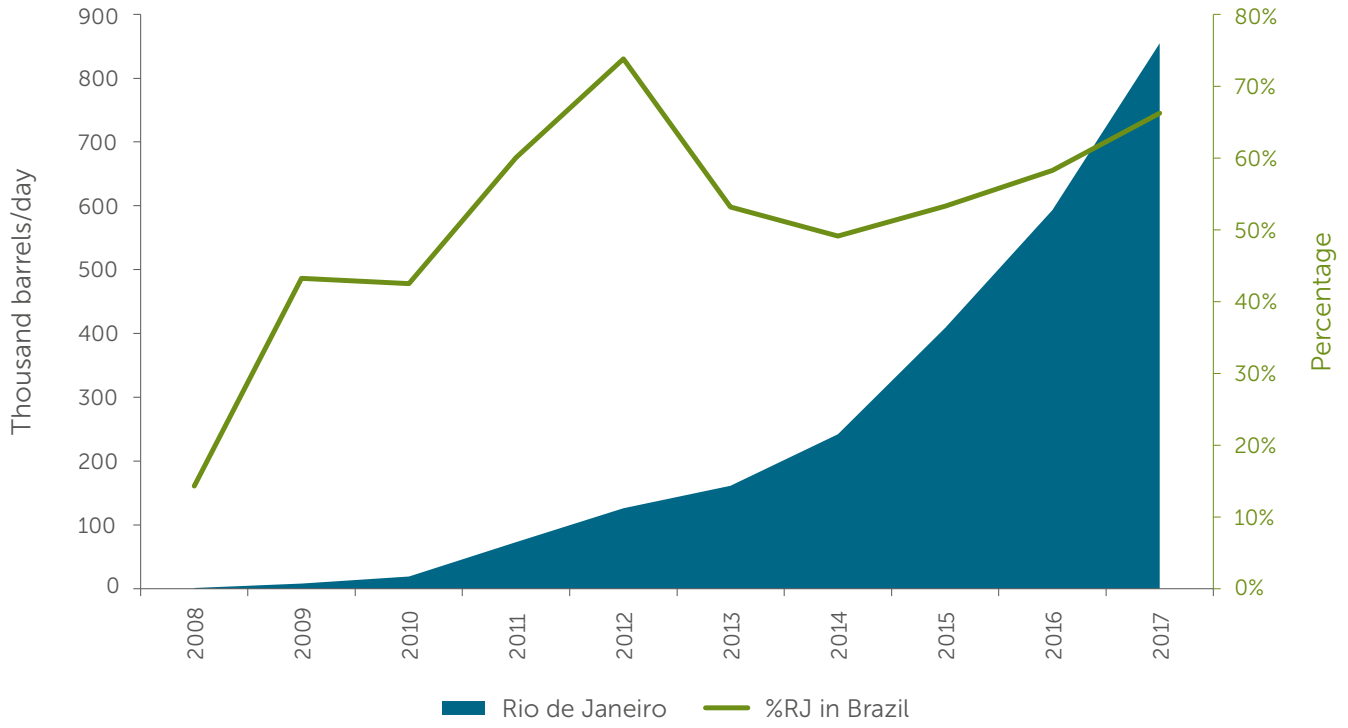


TABLE 4. OIL PRODUCTION IN PRE-SALT BY FIELD IN 2017 IN RIO DE JANEIRO

Source: ANP, 2018.

FIELD	BASIN	OIL (BBL/DAY)
Barracuda	Campos	2.546,65
Caratinga	Campos	12.433,63
Itapu	Santos	3.033,01
Lula	Santos	803.478,10
Marlim	Campos	1.505,33
Voador	Campos	1.905,80
Marlim Leste	Campos	19.011,51
Mero	Santos	10.698,27
Pampo	Campos	98,49
Total Production in the Campos Basin RJ - Pre-salt		**37.501,41**
Total Production in the Santos Basin RJ - Pre-salt		**817.209,38**
Total Rio de Janeiro Production in Pre-salt		**854.710,79**
% Brazil		***63%***

TABLE 5. SIGNS OF HYDROCARBONS IN RIO DE JANEIRO

Source: ANP, 2018.

FIELD/ BLOCK	BASIN	STATE	WELL CODE ANP	NOTIFICATION DATE	FLUIDS	WATER TABLE (M)
LIBRA	Santos	Rio de Janeiro	3BRSA1322RJS	25/01/16	Oil	1913
C-M-539	Campos	Rio de Janeiro	3REPF17RJS	07/03/16	Gas and Oil	2735,5
LIBRA	Santos	Rio de Janeiro	3BRSA1322RJS	08/03/16	Oil	1913
LIBRA	Santos	Rio de Janeiro	3BRSA1339ARJS	24/05/16	Oil	2033
ALBACORA	Campos	Rio de Janeiro	3BRSA1316RJS	07/06/16	Oil	334
LIBRA	Santos	Rio de Janeiro	3BRSA1342ARJS	05/07/16	Oil	1998
LIBRA	Santos	Rio de Janeiro	3BRSA1339ARJS	28/07/16	Oil	2033
LIBRA	Santos	Rio de Janeiro	3BRSA1343RJS	04/11/16	Oil	2025
MARLIM	Campos	Rio de Janeiro	9MRL231DRJS	16/06/17	Oil	604
LIBRA	Santos	Rio de Janeiro	3BRSA1345RJS	14/07/17	Oil	2087
MARLIM SUL	Campos	Rio de Janeiro	6BRSA1349RJS	27/07/17	Oil	1108
LIBRA	Santos	Rio de Janeiro	3BRSA1345RJS	03/08/17	Oil	2087
MERO	Santos	Rio de Janeiro	3BRSA1350RJS	05/09/17	Oil	2098
MARLIM	Campos	Rio de Janeiro	9MRL231DARJS	20/10/17	Oil	604
LIBRA	Santos	Rio de Janeiro	3BRSA1353DRJS	04/12/17	Oil	2008
LIBRA	Santos	Rio de Janeiro	3BRSA1356DRJS	12/01/18	Oil	1974
MARLIM LESTE	Campos	Rio de Janeiro	9MLL79DRJS	28/02/18	Oil	1691

TABLE 6. HISTORY OF SIGNS OF HYDROCARBONS AND DECLARATIONS OF COMMERCIALITY

Source: ANP, 2018.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Sign of Hydrocarbons - RJ	11	16	17	34	18	18	15	15	22	23	57	55	48	31	23	11	8	7
Declarations of Commerciality - RJ						5	10	3			1		4	7	21	1		1
Signs of Hydrocarbons - Brazil	**47**	**87**	**39**	**82**	**74**	**75**	**87**	**110**	**129**	**132**	**150**	**148**	**174**	**132**	**83**	**88**	**22**	**24**
Declarations of Commerciality - Brazil	**2**	**4**	**5**	**2**	**11**	**18**	**31**	**15**	**35**	**18**	**30**	**9**	**17**	**13**	**28**	**12**	**3**	**6**

TABLE 7. R/P RATIO IN BRAZIL AND IN RIO DE JANEIRO

Source: ANP, 2018.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Rio de Janeiro	21	19	19	20	20	19	18	20	19	17	20	21	22	23	24	18	17	16
Brazil	19	18	18	19	21	20	19	20	19	18	19	20	20	21	20	15	14	13

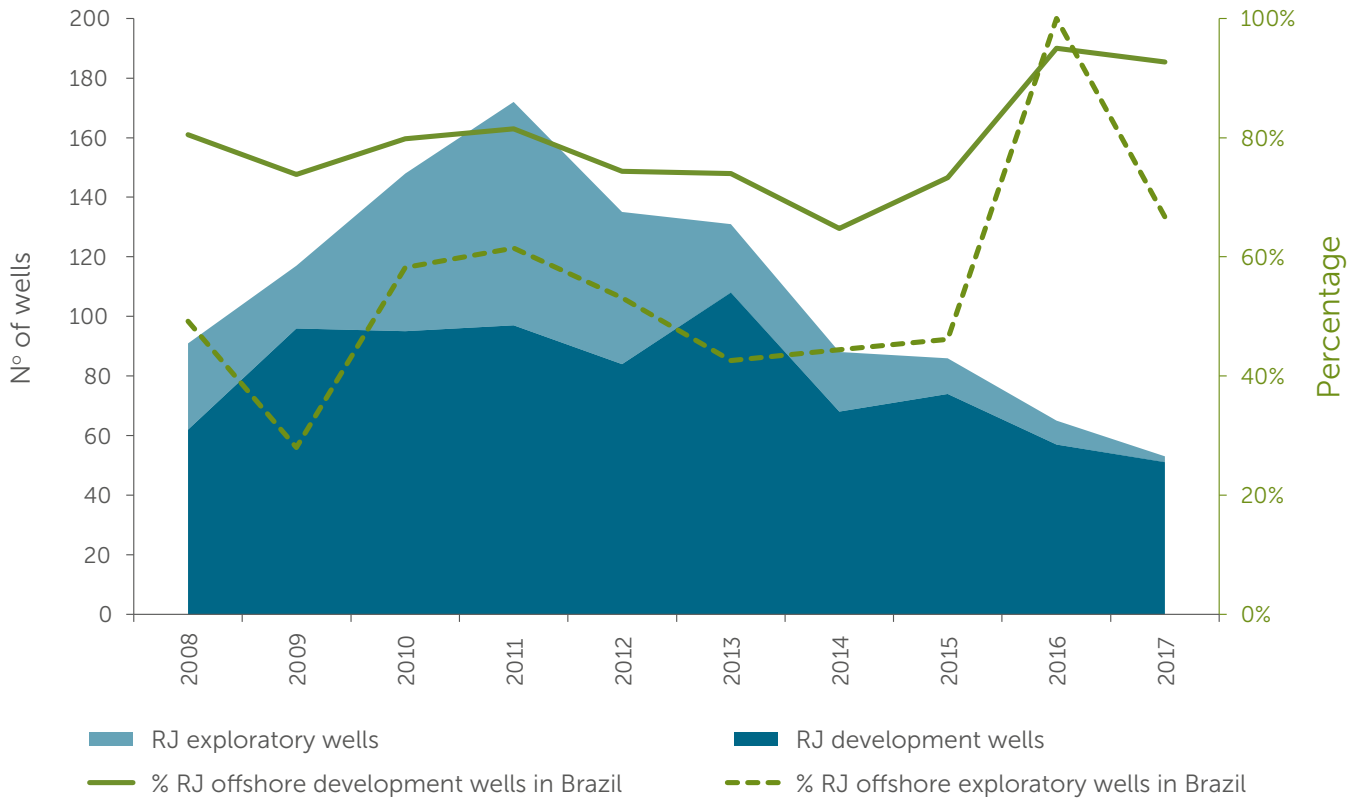
TABLE 8. EVOLUTION OF DRILLING ACTIVITY

Source: BDEP/ANP, 2018

WELLS	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RJ Development Wells	88	100	104	89	86	56	64	67	62	96	95	97	84	108	68	74	57	51
RJ Exploratory Wells	18	28	34	35	17	26	17	27	29	21	53	75	51	23	20	12	8	2
Total Brazil in Offshore	132	209	185	181	148	125	127	127	136	205	210	241	209	200	150	127	68	58
Total Brazil	**359**	**607**	**522**	**488**	**415**	**411**	**458**	**576**	**774**	**859**	**784**	**661**	**768**	**675**	**570**	**679**	**234**	**213**
% RJ Development Wells offshore	*93%*	*86%*	*88%*	*88%*	*92%*	*70%*	*74%*	*83%*	*81%*	*74%*	*80%*	*82%*	*74%*	*74%*	*65%*	*73%*	*95%*	*93%*
% RJ Exploratory Wells offshore	*49%*	*30%*	*51%*	*44%*	*31%*	*58%*	*43%*	*59%*	*49%*	*28%*	*58%*	*61%*	*53%*	*43%*	*44%*	*46%*	*100%*	*67%*
% RJ Total wells of Brazil	*30%*	*21%*	*26%*	*25%*	*25%*	*20%*	*18%*	*16%*	*12%*	*14%*	*19%*	*26%*	*18%*	*19%*	*15%*	*13%*	*28%*	*25%*

CHART 13. EVOLUTION OF DRILLING ACTIVITY IN RIO DE JANEIRO

Source: ANP, 2018.



CHAPTER 2

DOWNSTREAM

Challenges of the fuel distribution sector

Plural's article

The fuels distribution sector, known globally as downstream, plays a strategic role for the country. In 2017, 124.7 billion liters were distributed, making it the 7th biggest market worldwide.

In addition to this strategic function that drives Brazil, the sector is responsible for a significant portion of the country's tax collection: R$ 127 billion in 2017. The Circulation of Goods and Services Tax - ICMS, of the sector appears as the first collection item of all the Brazilian states.

If the current numbers are already significant, the estemate for 2030 its even greater: forecast consumption of 145 billion liters in the Otto and Diesel Cycle alone. To meet this demand, it will be necessary to increase, within the next 12 years, the supply of oil products in the country by 14%. Not to mention the fact that investments between R$ 40 and 50 billion in biofuel production and between R$ 13 and 14 billion in logistics infrastructure will be required.

These investments, however, will have to overcome several obstacles. Let's look at the main problems faced in the day-to-day of the distribution sector:

Legal Uncertainty, a Hindrance to Investments

The fuel sector is exposed to a series of regulatory risks that translate into the perception of legal uncertainty within the business environment and, consequently, creates unpredictability and discourages investments in the sector.

It is found that a representative part of the regulatory framework in force in Brazil is ineffective, either because it is outdated or because it fails to achieve its purposes.

Environmental licenses are a good example. The cumulative requirement of similar documents in various spheres of public administration (federal, state and municipal) multiplies the need for investment in human and financial capital to obtain such licenses, raising the cost of ventures and driving away investors.

We listed two key factors in establishing an attractive business environment:

1) Mitigating regulatory risks with the requirement to conduct Regulatory Impact Analysis (RIA) linked to the regulatory acts of public agents. This is a practice adopted in most developed countries. A RIA allows early evaluation of all the regulatory alternatives.

2) Observe the principle of predictability, that is, "what can be seen in advance; what can be predicted" should be present in the regulations and laws of the sector.

Based on these two factors, a first step to boost the flow of downstream investments is to provide a cycle of port and airport concessions, based on clear and fair rules, with a well-defined long-term horizon. A rational model for granting environmental licenses for the sector is necessary, with the creation of a fast track environmental process for priority investments in infrastructure, which would provide, in addition to improving the business environment, greater efficiency and return to society. It is also important to prioritize and encourage more efficient logistics modalities, taking into account the continental distances and geographical peculiarities that exist in Brazil.

An integration of the different government programs, already under development such as Renovabio and Combustível Brasil, is called for. The elaboration of relevant legislation should aim at the coexistence of these programs in accordance with the basic principles of efficiency and free competition.

Threats of Interference of the State

Brazil's Constitution governs, in its Article 170, the basis in the "valorization of human labor, [in] free initiative" and free competition, basic forms that allow the individual to fully realize his own capabilities.

Currently, there are fronts that encourage direct interference by the state, for example, as the agent that defines market prices (freight, margins or the own fuel marketed to the final consumer), that is, in clear conflict with what is established in the Constitution. This would be an unacceptable setback for the industry and for society.

The Tax Burden and Its Complexity Encouraging Unfair Competition

The tax complexity resulting from the 27 state ICMS Tax rates and legislations has been the cause of constant administrative and judicial inquiries, resulting, according to a study by FGV-RJ, in R$ 4.8 billion/year in tax evasion and delinquency, unrecoverable tax debts, since these are mostly companies without assets and longevity to honor these liabilities.

This complex taxation in the fuel sector can be solved by the legal establishment of the ICMS Single-Phase by Confaz, as set forth in Constitutional Amendment No. 33/2001. Single-phase assumes a single value for each product throughout the national territory, in addition to concentrating the collection in a specific link in the chain - producer/importer.

Single-phase is crucial to mitigate the sector's huge competitive gaps in order to reduce evasion and delinquency and improve the business environment. In short, single-phase will contribute to:

a) De-indexing the taxes of price movements in the producers;

b) Provide greater stability in the final price to the consumer;

c) Contribute to the end of the fiscal war between states;

d) As a result, discourage instances of fraud that directly affect the end consumer, such as forgeries and metrological fraud.

Of great relevance, such as the approval of the ICMS Single-Phase, it is imperative that the Judiciary, in this case of Federal Supreme Court - STF, flexibilize the Biding Precedent 70, recognizing the figure of the Defaulting Tax Debtor, distinguishing it from the occasional debtor that has to be protected by the state unlike the Defaulting, the one that uses in a premeditated way the nonpayment of taxes as its business model, destroying the competition.

In parallel, the Senate and the Chamber of Federal Deputies are processing two extremely important projects that aim to establish this distinction through the regulation of Article 146-A of the Federal Constitution. In the Chamber, we highlight PLP 416/2017, and in the Senate, PLS 284/2017.

Integration of Government Databases and Systems Aiming at Accuracy and Agility in Inspection Activities

Today, Brazil's Internal Revenue Service has the ability to cross all data related to Income Tax. We understand that it is possible to integrate the databases of the Brazilian National Agency of Petroleum, Natural Gas and Biofuels - ANP, Finance Secretariats, Integrated Foreign Trade system - SISCOMEX, and the Internal Revenue Service itself. In view of this transparency of data, government control would occur quickly and efficiently. At the same time, self-inspection of the sector itself would necessarily be implemented by the various companies.

The importance of the downstream sector to the country means that our mission is to guarantee the sustainability of this chain with proposals for practical actions that improve the business environment. We need to promote best practices in order to stop unfair competition. And Plural has the responsibility to engage, inform and be a protagonist in this scenario of changes in the downstream sector.

Charts and tables

CHART 14. HISTORY OF OIL PROCESSING IN RIO DE JANEIRO

Source: ANP, 2018.

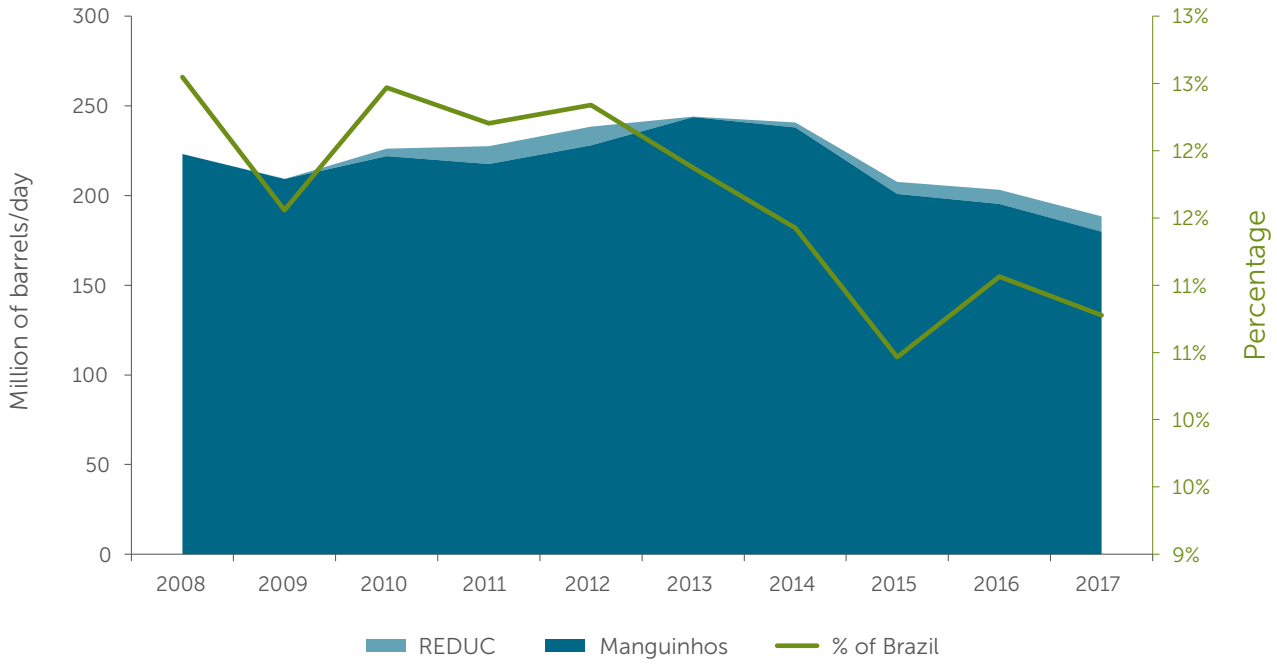


TABLE 9. EVOLUTION OF REFINERIES CAPACITY AND OCCUPANCY RATE IN RIO DE JANEIRO

Source: MME e ANP, 2018.

REFINERIES OF RJ AND UNITS OF THE FEDERATION	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Manguinhos (thousand bbl/day)	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	13,8	14,0	14,0	14,0
Reduc (thousand bbl/day)	242,2	242,2	242,2	242,2	242,2	242,2	242,2	242,2	242,2	242,2	242,2	251,6	251,6
Refining Occupancy Level in RJ	86%	86%	82%	87%	82%	88%	89%	93%	95%	94%	81%	76%	71%
Total Rio de Janeiro (thousand bbl/day)	**256,0**	**256,0**	**256,0**	**256,0**	**256,0**	**256,0**	**256,0**	**256,0**	**256,0**	**256,0**	**256,2**	**265,6**	**265,6**
% Brazil	13%	13%	12%	12%	12%	12%	12%	12%	12%	11%	11%	11%	11%
Total São Paulo (thousand bbl/day)	840	840	847	865	897	897	899	899	899	918	927	923	928
Total Bahia* (thousand bbl/day)	323	323	323	297	282	282	282	282	379	379	379	379	380
Total Rio Grande do Sul (thousand bbl/day)	206	206	206	206	206	206	218	218	218	218	237	237	237
Total Other States** (thousand bbl/day)	420	420	432	452	452	452	460	450	450	539	580	596	581
Total Brazil* (thousand bbl/day)**	**2.044**	**2.044**	**2.064**	**2.077**	**2.093**	**2.093**	**2.116**	**2.106**	**2.203**	**2.311**	**2.374**	**2.402**	**2.391**

*The RLAM refinery of Bahia has an asphalt plant with a capacity of 3,773.9 barrels/day
** Includes the Refineries: LUBNOR (CE), REGAP (MG), REMAN (AM), REPAR (PR), RPCC (RN) and RNEST (PE).
*** Consider the nominal capacity in barrels/day

TABLE 10. PRODUCTION BY OIL PRODUCTS IN RIO DE JANEIRO AND TOTAL BY REFINERY
Source: ANP, 2018.

PRODUCT (THOUSAND M³)	2000	2001	2002	2003	2004	2005	2006	2007
DISEL OIL	2.634,17	2.542,94	2.683,05	2.684,07	3.231,35	2.933,60	3.031,02	2.742,68
FUEL OIL	2.361,67	2.359,19	2.771,82	2.833,16	3.038,20	2.935,29	3.010,44	3.045,66
GAS A	2.548,65	2.491,21	2.528,26	2.282,56	2.294,10	2.218,03	2.055,94	1.843,17
AVIATION KEROSENE	831,99	697,54	643,29	805,43	904,68	980,27	741,30	773,42
LPG	771,61	794,40	949,03	1.303,38	1.399,39	1.424,30	1.184,69	1.075,88
AVIATION GAS	-	-	-	-	-	-	-	-
ILLUMINATING KEROSENE	19,56	43,01	31,33	12,66	6,13	3,49	2,13	1,38
OTHER ENERGY	-	-	-	-	-	-	-	-
NAPHTHA	896,90	988,80	1.016,70	1.163,15	1.210,58	1.348,84	1.701,76	1.578,74
OTHER NON-ENERGY	120,79	161,98	260,98	215,58	211,15	362,68	845,41	861,11
COKE	-	-	-	-	-	-	-	-
LUBRICANT	723,16	695,45	653,47	679,58	619,74	662,71	615,59	462,00
ASPHALT	181,34	171,13	162,07	75,33	121,34	95,29	157,41	179,69
PARAFFIN	38,56	37,75	37,65	40,86	40,16	42,32	36,55	15,93
SOLVENT	45,91	45,90	119,44	227,53	291,05	213,54	67,81	43,09
Total Reduc	**10.462,45**	**10.188,84**	**11.067,50**	**11.385,73**	**12.461,48**	**12.769,13**	**13.282,40**	**12.544,54**
Total Manguinhos	**711,89**	**840,46**	**789,59**	**937,56**	**906,38**	**451,22**	**167,64**	**78,20**
Total Rio de Janeiro	**11.174,34**	**11.029,29**	**11.857,08**	**12.323,30**	**13.367,87**	**13.220,35**	**13.450,04**	**12.622,74**
Total Brazil	**93.061,07**	**97.427,42**	**94.999,75**	**95.007,89**	**100.459,66**	**101.789,80**	**103.440,28**	**105.735,04**
% of RJ in Brazil	*12%*	*11%*	*12%*	*13%*	*13%*	*13%*	*13%*	*12%*

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
3.070,81	3.039,23	3.474,26	3.469,05	3.462,76	3.882,58	3.374,10	2.992,32	3.089,15	2.686,17
2.900,10	1.940,30	1.890,04	2.187,62	2.584,32	2.904,75	2.873,76	2.467,12	1.777,08	1.886,46
1.819,58	1.962,36	2.403,05	2.800,24	2.624,14	2.261,16	2.482,07	2.202,92	2.357,54	2.243,09
885,13	966,44	1.050,01	1.194,74	1.177,00	1.318,08	1.324,24	1.214,87	1.402,48	1.326,73
1.159,72	1.216,72	1.048,60	1.150,08	1.056,88	977,94	953,08	863,45	1.117,43	1.366,73
-	-	-	-	-	-	-	-	-	-
1,73	-	-	-	-	-	-	-	-	-
201,58	6,76	14,44	236,01	204,32	30,34	27,42	-	-	-
1.788,89	1.564,03	1.470,97	1.219,04	1.666,14	1.501,75	1.648,79	1.407,75	1.157,95	1.268,23
833,57	715,40	909,22	1.082,22	924,20	841,90	801,64	730,75	782,43	682,73
264,94	397,89	455,55	535,23	601,21	612,16	520,23	493,25	523,62	470,27
571,87	449,86	459,90	403,81	432,93	532,55	510,83	486,19	470,96	464,90
221,62	144,84	180,48	206,23	262,97	218,69	316,32	91,33	79,58	70,86
21,99	11,10	5,80	14,37	9,09	10,59	15,83	16,00	13,80	11,94
22,60	7,87	2,49	17,06	2,86	-	-	-	-	-
13.740,54	**12.362,93**	**12.992,95**	**13.916,01**	**14.409,48**	**15.076,50**	**14.690,96**	**12.571,41**	**12.310,98**	**12.024,79**
23,59	**59,88**	**371,85**	**599,68**	**599,34**	**15,98**	**157,36**	**394,53**	**461,03**	**453,34**
13.764,13	**12.422,81**	**13.364,80**	**14.515,70**	**15.008,81**	**15.092,47**	**14.848,32**	**12.965,94**	**12.772,02**	**12.478,12**
105.438,54	**106.540,71**	**106.840,62**	**111.496,02**	**117.327,81**	**123.905,34**	**126.468,03**	**118.448,72**	**110.856,75**	**105.841,30**
13%	*12%*	*13%*	*13%*	*13%*	*12%*	*12%*	*11%*	*12%*	*12%*

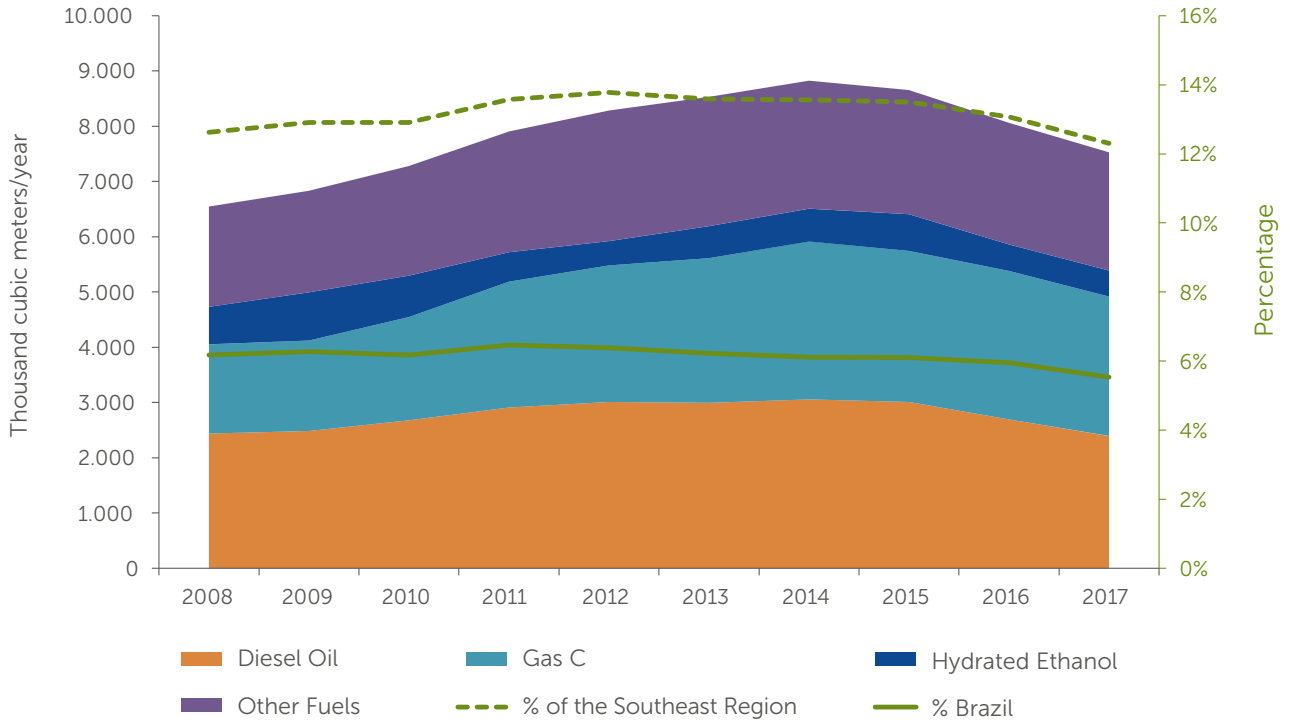
TABLE 11. HISTORY OF THE SALE OF FUELS IN THE STATE OF RIO DE JANEIRO (M^3)

Source: ANP, 2016.

PRODUCT	2000	2001	2002	2003	2004	2005	2006	2007
HYDRATED ETHANOL	232.189,44	155.572,41	157.566,84	98.177,87	109.816,56	180.528,03	224.254,94	359.404,27
GAS C	1.847.747,04	1.772.336,57	1.971.934,25	1.764.595,11	1.848.172,40	1.739.318,62	1.660.802,99	1.635.151,71
DIESEL OIL	2.009.407,79	2.177.979,77	2.253.093,12	2.184.689,66	2.139.262,19	2.188.716,30	2.185.277,21	2.355.824,07
AVIATION GASOLINE	1.506,53	1.469,96	1.185,38	1.130,12	1.170,74	1.027,02	1.127,03	1.391,18
LPG	959.481,37	950.375,39	956.475,14	955.223,09	974.654,23	952.325,81	950.930,15	1.017.120,36
FUEL OIL	990.907,51	904.583,96	568.415,31	213.069,78	131.155,33	130.132,48	62.772,66	55.308,20
AVIATION KEROSENE	611.964,76	699.449,12	636.557,92	519.763,26	575.757,12	653.801,21	637.434,04	739.972,26
ILLUMINATING KEROSENE	14.003,78	20.387,41	22.907,52	8.626,60	6.559,11	2.215,49	1.396,44	1.540,78
Total Fuel Sales	**6.667.208,21**	**6.682.154,58**	**6.568.135,49**	**5.745.275,48**	**5.786.547,69**	**5.848.064,97**	**5.723.995,45**	**6.165.712,82**
% Southeast Region	*14%*	*14%*	*15%*	*14%*	*14%*	*13%*	*13%*	*13%*
% Brazil	*7%*	*7%*	*7%*	*7%*	*7%*	*7%*	*6%*	*6%*

CHART 15. HISTORY OF THE SALE OF FUELS IN RIO DE JANEIRO

Source: ANP, 2018.



* Other include: Aviation Gas, Fuel Oil, Aviation Kerosene, LPG and Illuminating Kerosene.

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
677.059,60	872.813,85	746.457,54	531.759,96	435.277,07	583.074,86	590.305,33	664.315,16	480.808,20	473.762,91
1.616.429,48	1.636.890,68	1.867.262,45	2.280.077,81	2.470.659,32	2.616.821,21	2.861.013,38	2.733.573,24	2.684.903,52	2.522.844,54
2.437.017,43	2.482.817,83	2.681.353,94	2.911.125,70	3.012.725,67	2.994.134,51	3.056.342,64	3.006.992,11	2.693.299,74	2.395.031,23
1.293,58	1.431,03	873,68	757,01	1.248,18	1.752,68	1.587,46	1.236,61	961,28	1.017,84
953.916,58	939.740,93	972.766,95	1.002.220,31	1.007.498,80	1.004.884,56	1.013.770,60	995.802,74	1.005.056,44	1.008.900,53
63.832,01	47.046,85	44.379,52	42.595,96	29.268,36	31.017,41	28.206,36	21.863,91	14.722,36	33.409,83
793.209,62	851.160,77	968.722,66	1.134.095,69	1.329.814,67	1.302.283,07	1.273.409,98	1.230.295,51	1.176.461,74	1.095.103,65
962,31	17,02	5,83	24,39	0,04	0,53	6,76	13,46	592,10	462,10
6.543.720,62	**6.831.918,95**	**7.281.822,57**	**7.902.656,82**	**8.286.492,12**	**8.533.968,82**	**8.824.642,51**	**8.654.092,74**	**8.056.805,39**	**7.530.532,61**
13%	*13%*	*13%*	*14%*	*14%*	*14%*	*14%*	*13%*	*13%*	*12%*
6%	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*

TABLE 12. AVERAGE FUEL PRICES FOR DISTRIBUTOR AND FOR THE CONSUMER

Source: ANP, 2018.

PRODUCT	LOCATION	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Gas	**R$/l**														
Distributor Price	Rio de Janeiro	1,89	2,11	2,32	2,27	2,26	2,28	2,33	2,49	2,48	2,60	2,72	3,05	3,42	3,60
	Brazil	1,85	2,09	2,28	2,21	2,22	2,23	2,29	2,42	2,40	2,50	2,61	2,95	3,28	3,34
Resale Price	Rio de Janeiro	2,12	2,34	2,56	2,53	2,55	2,57	2,65	2,83	2,85	3,00	3,13	3,55	3,92	4,11
	Brazil	2,18	2,44	2,65	2,60	2,60	2,61	2,66	2,78	2,78	2,91	3,02	3,42	3,75	3,81
Ethanol	**R$/l**														
Distributor Price	Rio de Janeiro	1,05	1,37	1,66	1,44	1,43	1,44	1,58	1,95	1,91	1,94	2,11	2,27	2,80	2,85
	Brazil	1,12	1,45	1,69	1,47	1,50	1,49	1,64	1,93	1,94	2,01	2,11	2,23	2,73	2,75
Resale Price	Rio de Janeiro	1,29	1,56	1,88	1,70	1,68	1,71	1,87	2,24	2,23	2,29	2,45	2,73	3,24	3,31
	Brazil	1,47	1,70	1,97	1,75	1,77	1,77	1,94	2,20	2,23	2,31	2,44	2,62	3,13	3,18
GNV	**R$/m³**														
Distributor Price	Rio de Janeiro	0,65	0,65	0,68	0,75	1,03	1,10	1,12	1,22	1,27	1,32	1,34	1,41	1,44	1,61
	Brazil	0,80	0,86	0,96	1,03	1,20	1,29	1,28	1,31	1,36	1,42	1,49	1,59	1,70	1,78
Resale Price	Rio de Janeiro	1,10	1,10	1,15	1,27	1,56	1,54	1,56	1,66	1,66	1,68	1,74	1,95	2,10	2,25
	Brazil	1,14	1,24	1,38	1,47	1,66	1,73	1,72	1,72	1,80	1,88	1,98	2,18	2,40	2,48
Diesel	**R$/l**														
Distributor Price	Rio de Janeiro	1,27	1,51	1,64	1,65	1,81	1,83	1,74	1,76	1,82	1,99	2,17	2,45	2,68	2,78
	Brazil	1,31	1,56	1,69	1,70	1,84	1,84	1,76	1,79	1,86	2,08	2,26	2,56	2,76	2,78
Resale Price	Rio de Janeiro	1,49	1,76	1,90	1,89	2,05	2,08	2,02	2,04	2,10	2,27	2,47	2,80	3,06	3,22
	Brazil	1,45	1,70	1,84	1,83	2,01	2,06	2,01	2,03	2,07	2,37	2,56	2,89	3,11	3,20
LPG	**R$/13 kg**														
Distributor Price	Rio de Janeiro	24,04	24,29	25,66	25,76	25,41	26,24	27,89	27,95	27,59	27,01	27,44	28,97	34,04	38,09
	Brazil	26,54	26,53	28,05	28,35	28,18	29,24	30,47	30,97	31,80	32,98	34,43	37,53	41,38	45,09
Resale Price	Rio de Janeiro	28,70	29,31	31,03	31,84	31,73	34,02	37,92	37,58	37,88	39,22	42,20	45,97	50,45	55,77
	Brazil	31,73	31,77	33,70	34,46	34,68	36,60	38,69	39,22	40,12	42,34	44,80	50,55	56,65	61,82

CHART 16. AVERAGE FUEL PRICES FOR THE CONSUMER IN BRAZIL

Source: ANP, 2018.

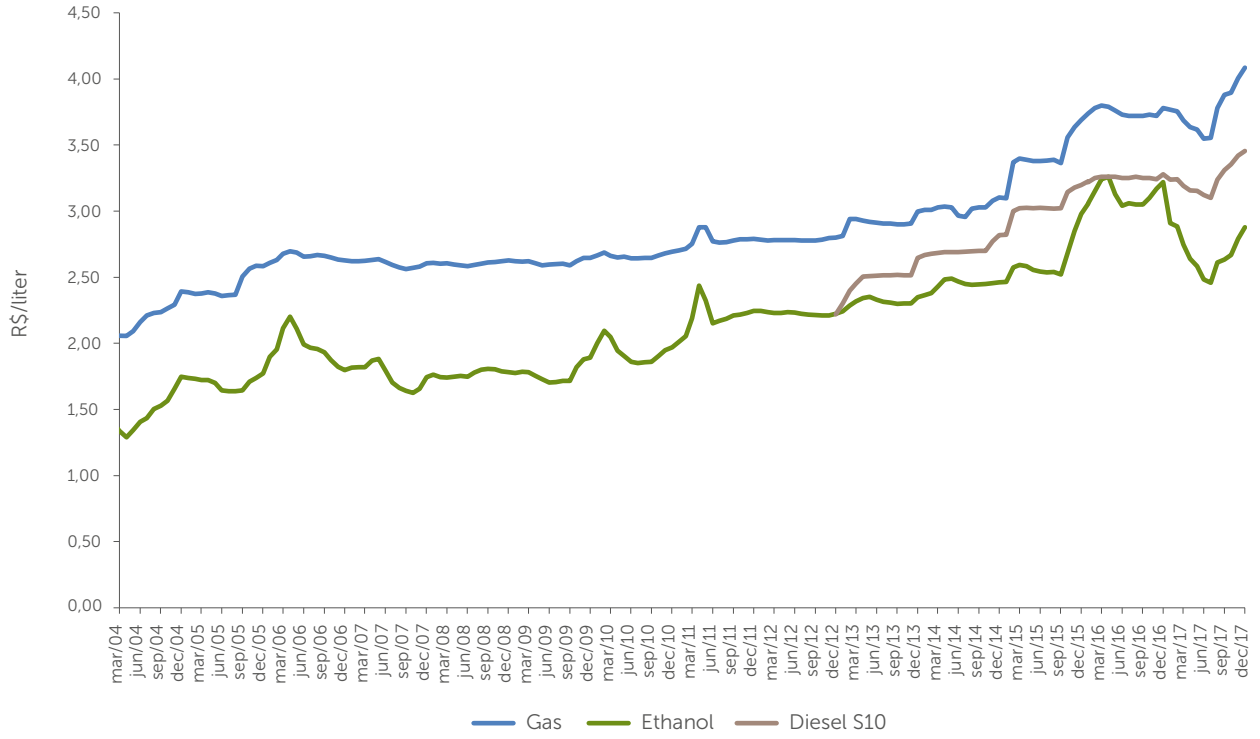
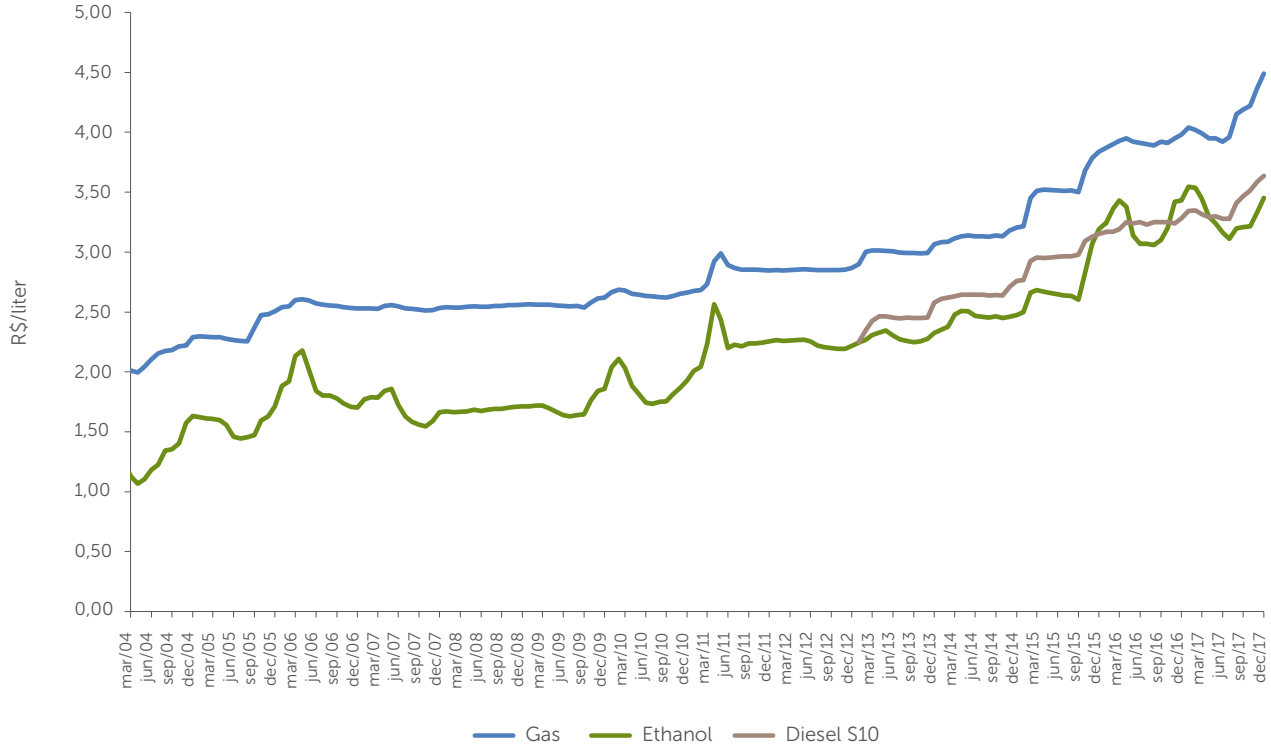


CHART 17. AVERAGE FUEL PRICES FOR THE CONSUMER IN RIO DE JANEIRO

Source: ANP, 2018.



CHAPTER 3

RESEARCH, DEVELOPMENT AND INNOVATION

Innovation as Agenda for Development

BNDES's article

The Oil and Gas market has, for years, been responsible for most of the investments in the Brazilian economy, with over 10% of the country's Fixed Gross Capital Formation. The fact of owning an oil province like the pre-salt, whose oil is of high quality, and whose fields of a very high productivity with the potential for huge reserves, places Brazil in a leading position in the exploration and production of offshore oil.

Despite taking into account the increase in environmental restrictions and growing use of renewable energies, oil and gas, which are the main sources of primary energy worldwide, will still be in high demand for decades. The use of oil and natural gas (O&G), through their derivatives and petrochemicals, goes far beyond energy supply. Contemporary society is extremely dependent on products and services that use them every day, directly or indirectly. Thus, although a relative decline in its share of the energy matrix is expected, there will indeed be an absolute increase in O&G production in the coming years.

The International Energy Agency (IEA) highlights the relevance of Brazil, which will become responsible for the production of about 50% of the world's offshore oil in 2040, about 5.2 million barrels/day. For this, investments in the Brazilian O&G sector in the order of US$ 1 trillion will be necessary, with 87% in exploration and production (E&P), 5% in refinement and the rest in oil and gas transportation.

The potential of oil for the generation of wealth for a nation is not only based on its exploitation and commercialization. On the contrary, world examples show that it is technological and industrial development, under the innovation vector, that guarantee competitiveness and wealth generation in the long run. Through innovation, it is possible to increase productivity, the constant reduction of costs, the insertion in the global supply chain, and increase the environmental sustainability of the sector over time. It is important for the country to guarantee instruments capable of maintaining a strong agenda of innovation in the sector on a regular and permanent basis.

The main source of funds to promote the innovation of the O&G sector in Brazil comes from the contractual obligation to invest in research, development and innovation (RD&I) in the contracts of operators with the National Oil, Natural Gas and Biofuel Agency (ANP). This resource is distributed by means of pre-established percentages and not by a criterion that meets the need to enable an innovation project in its various phases of development.

It would be important to have a model, or a new complementary instrument, in which the research and innovation project is, by itself, the key point of the decision on the distribution of the resources of ANP's RD&I clause. That is, the allocation of resources would depend on the merit inherent to innovation projects and their development phase, regardless of whether they are located in universities, in operators, or in companies of the supply chain. Naturally, innovation projects with the greatest technological challenges to be supported can involve these groups of players simultaneously, without forgetting that the locus of innovation, in the sense of bringing innovative products to market, is in companies.

This new instrument would be a Development Fund for Innovation in the O&G sector to complement the existing ones. Mandatory resources of the RD&I clause not invested could, alternatively, be applied in this fund which, by mission, would be responsible for supporting research and innovation projects. The financial support would suit the profile of the companies (operators/supply chain) and universities, but, above all, the profile of the innovation project. The Fund would share the risk of developing the innovation projects with the companies. Not through equity interest, but through refundable and non-reimbursable financial support, boosting investments in innovation in the O&G sector. As a focus, the application of its resources would focus mainly on disruptive and transformative innovations that could revolutionize the way of producing offshore oil, increasing investments and export bias of the country's goods and services in the future, as presented in the book "BNDES Visão 2035: Brasil, um país desenvolvido" [BNDES 20135 Vision: Brazil, a developed country].

The sector's technological innovation agenda should prioritize projects that materialize the expected benefits of

the concepts of digitization, big data, remote operation, aligned with development of the submarine factory in the future. For this, cooperation between oil companies, their suppliers and technology centers will be paramount. This agenda should also include innovation projects that promote environmental sustainability, for example, seeking to make CO_2 capture and energy efficiency economically viable.

The incentive mechanisms for innovation should also be linked to the local content policy (PCL), which in turn, in addition to innovation, should encourage competitiveness, productivity, export and the generation of skilled jobs in the country. PCL must always be calibrated to enable its noble mission of developing an economically sustainable and internationally competitive production chain. A PCL that benefits one party to the detriment of others will not be successful, but one that is able to make viable economic gains appropriate to exploratory activity, the related industrial activity, and also ensure the sustainability of investments in the long run.

Lastly, BNDES Finame's new methodology, in principle, qualifies the local content considering the technological content of the product and the company's efforts in innovation, export, productivity and the generation of qualified employment, essential factors for competitiveness and sustainability in the long term. It would be important for the PCL of the O&G sector to incorporate these concepts, especially with regard to innovation.

Charts and tables

CHART 19. OBLIGATION OF INVESTMENTS IN R,D&I OF PETROBRAS AND OTHER CONCESSIONAIRES

Source: ANP, 2018.

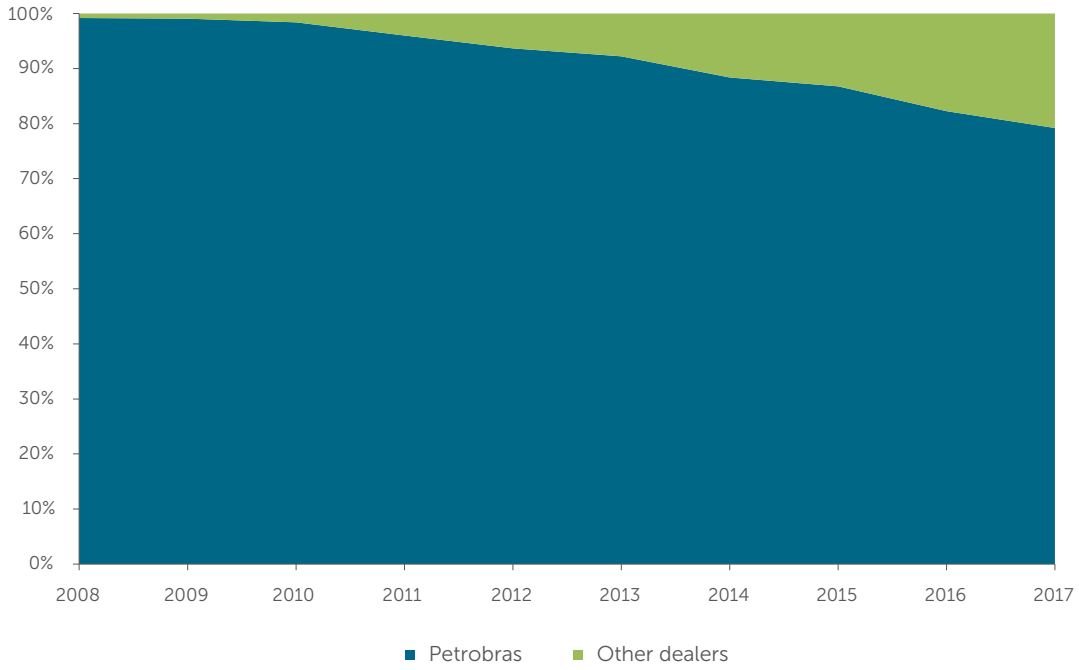


CHART 20. RESOURCES OF THE R,D&I CLAUSE AUTHORIZED BY ANP

Source: ANP, 2018.

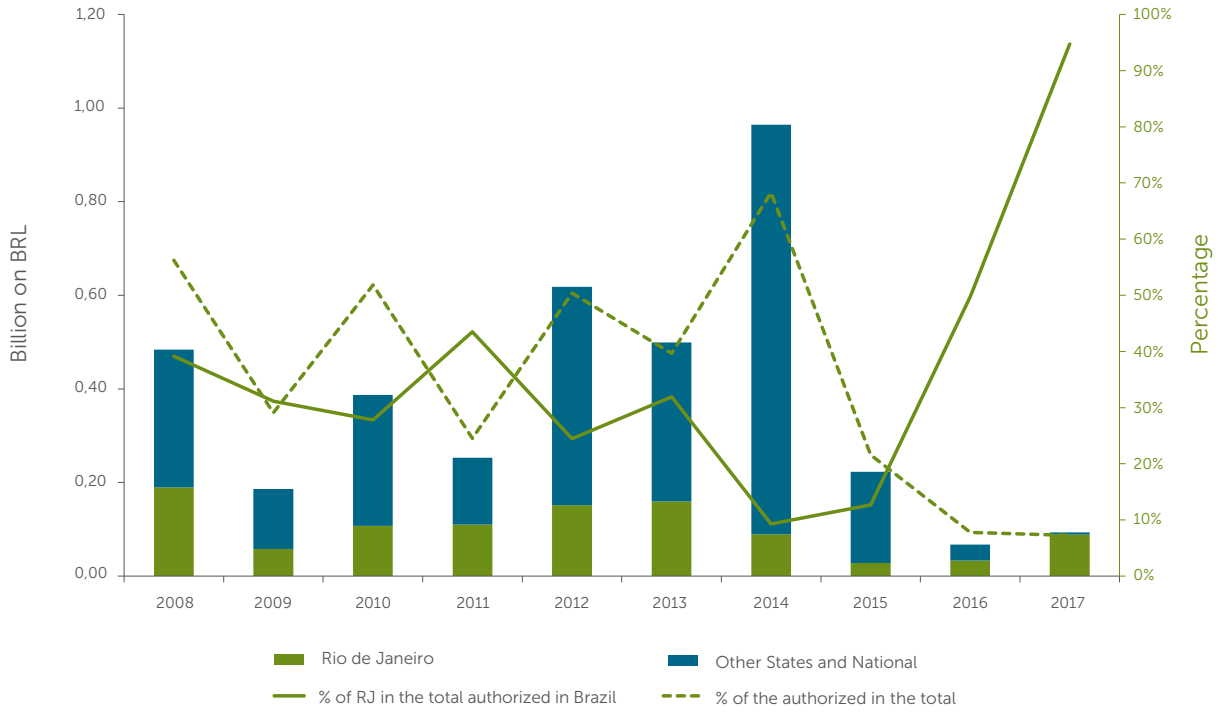


TABLE 13. RESOURCES OF THE R,D&I CLAUSE AND INVESTMENT IN PROJECTS IN RIO DE JANEIRO

Source: ANP, 2018.

RESOURCES IN (R$)	2006	2007	2008	2009	2010
Total R,D&I Resources	616.389.336,14	616.503.266,32	860.858.232,82	638.882.283,84	746.917.020,36
Total Authorized by ANP	580.521.540,33	430.386.595,95	484.139.861,98	186.024.905,56	387.189.728,09
% authorized in Rio de Janeiro	**32%**	**40%**	**39%**	**31%**	**28%**

* Reduction in the participation of states in resources of the R,D&I Clause was due to the increase in transfers to projects classified as National

TABLE 14. RESOURCES OF THE R,D&I CLAUSE INVESTED BY BRAZILIAN STATE (EM R$)

Source: ANP, 2018.

STATES	Up to 2015	2016	2017	Total
RJ	1.262.907.058,58	33.603.579,18	88.723.733,41	1.296.510.637,76
SP	425.222.976,50	6.213.145,02	13.552.451,78	431.436.121,52
RS	185.761.418,11	12.533.892,04	4.613.616,79	198.295.310,15
PE	178.700.860,48	313.809,50	-	179.014.669,98
RN	161.866.114,53	-	2.386.702,90	161.866.114,53
SC	130.077.987,40	6.125.398,73	-	136.203.386,14
Others*	2.296.846.721,28	8.721.461,89	23.583.599,59	2.305.568.183,17
Brazil	**4.641.383.136,88**	**67.511.286,37**	**132.860.104,48**	**4.708.894.423,25**

* Others include: BA, MG, SE, ES, PA, CE, PR, DF, MA, AL, PB, AM, GO, MS, PI, TO, MT and those projects that are carried out in more than one state (called "Miscellaneous" by ANP)

2011	2012	2013	2014*	2015*	2016	2017
1.031.896.895,04	1.226.686.690,65	1.259.866.956,23	1.407.565.231,01	1.030.956.397,00	861.964.182,76	1.292.000.000,00
252.909.837,26	618.155.230,26	499.414.596,32	964.211.481,75	225.778.042,58	67.511.286,37	93.662.857,24
44%	**24%**	**32%**	**9%**	**13%**	**50%**	**64%**

TABLE 15. R,D&I RESOURCES INVESTED BY OPERATOR (EM R$)
Source: ANP, 2018.

OPERATOR	UP TO 2016	2017	TOTAL BASE	UP TO 2016 RJ	2017 RJ	%RJ OF THE TOTAL
Petrobras	4.372.251.444,02	73.989.225,76	**4.446.240.669,78**	1.178.566.241,97	33.692.757,64	*46%*
BG	193.927.954,40		**193.927.954,40**	73.691.543,09		*0%*
Statoil	36.700.317,10		**36.700.317,10**	5.739.944,05		*0%*
Shell	23.510.770,37	265.598.643,98	**289.109.414,35**	64.000,00	59.970.099,60	*21%*
Petrogal	26.334.151,61	2.628.848,00	**28.962.999,61**	11.214.699,87		*0%*
Sinochem	16.964.172,67	1.905.000,00	**18.869.172,67**	11.021.172,61		*0%*
Repsol	10.363.982,02	3.223.405,52	**13.587.387,54**	6.050.941,55		*0%*
Queiroz Galvão	9.621.165,41		**9.621.165,41**	3.928.839,76		*0%*
Chevron	6.365.973,55		**6.365.973,55**	4.832.132,28		*0%*
PGN	5.566.580,70		**5.566.580,70**			*0%*
Frade Japão	3.157.523,11		**3.157.523,11**			*0%*
BP	2.321.857,73		**2.321.857,73**			*0%*
GeoPark	672.903,42		**672.903,42**	643.188,42		*0%*
ONGC	503.790,00		**503.790,00**			*0%*
Brasoil	236.250,00		**236.250,00**			*0%*
QPI	192.288,56		**192.288,56**	192.288,56		*0%*
Rio das Contas	111.100,61		**111.100,61**	111.100,61		*0%*

CHAPTER 4

SOCIOECONOMIC IMPACTS

Evaluation of the labor market in the oil production chain

Sistema FIRJAN's article

Labor market movements represent an important thermometer of economic activities insofar as they are related to the expectation, performance and production of companies.

In recent years, the main employment data had shown a trajectory of significant retractions in the Rio de Janeiro State Oil and Gas Chain, and although there is still no recovery in the sector, more recent information already shows signs of weakening of the oil crisis.

For the record, in 2017, the oil sector in Rio de Janeiro was formed by 82.2 thousand workers. In comparison with the previous year, the period is still marked by a drop of -2.6% of jobs (-2.2 thousand). However, this result is considerably less intense than the falls recorded in the previous two years: -8.3% in 2016 (-7.7 thousand) and -4.1% in 2015 (-3.9 thousand).

The movements of the Rio de Janeiro chain follow the Brazilian pace, which also shows a reduction in the intensity of decline in 2017. However, results in Brazil are at a higher level than in Rio de Janeiro, since the national labor market has been less impacted since the beginning of the crisis. Thus, the reduction of the national chain's fall rate, presented in 2017, brings the Brazilian oil sector closer to stability than the sector of Rio de Janeiro (-0.9% in Brazil, compared to -2.6% in Rio de Janeiro).

In spite of the movements, the importance of the state in the national oil chain is indisputable: 16.4% of all employees in the Brazilian oil sector are from Rio de Janeiro, and although this figure has been slightly reduced in recent years (17.5% in 2016 and 18.3% in 2015), the state remains Brazil's second biggest oil employer.

First, there is the state of São Paulo, which concentrates 22.0% of the national workforce of the sector (110 thousand employees). However, we must bear in mind that the two biggest employers in the oil chain - São Paulo and Rio Janeiro - have very different operating profiles. The oil chain is divided into three major links encompassing several activities: the Exploration & Production (E&P) link, the Supply link and the Supply Chain link. In São Paulo, almost all of the employees work in the Supply link (97.1%) - which also occurs in many Brazilian states. While in Rio de Janeiro, although Supply (60.3%) workers also prevail, the main highlight is the extraction itself. With 29.7 thousand employees in the link, Rio is the country's main oil producer, with a market more than six times bigger than that of Bahia - the second most active state in the chain (4.4 thousand).

Reaffirming the state's relevance in the extraction, Rio de Janeiro concentrates 64.7% of the entire national Exploration & Production workforce, and in the evolutionary analysis this representativeness practically continues (+0.3 p.p. in relation to 2016). This is because in 2017 the amount of Rio de Janeiro's extractive labor falls at a pace similar to that of the national amount.

Still evaluating the Rio de Janeiro movement, the chain links have different behaviors among them. E&P and the Supply Chain follow the trend of the oil chain as a whole: in terms of the labor market, both are beginning to feel the crisis more strongly in 2015 (when there is a reduction of -9.7% in E&P and of -11.2% in the supply chain), experiencing the worst retraction in 2016 (-17.3% in E&P and -15.2% in the supply chain), and in 2017 having less accentuated negative variations (-3.0% in E&P and -7.7% in the supply chain). For Supply, the movements are quite different, since the market retraction only manifests itself in 2016 (-1.4%) and intensifies in 2017 (-2.1%), unlike that recorded for the other links and for the chain as a whole.

Detailing the movement of each chain, for the Exploration & Production, the shrinking of the labor market portrayed in the previous paragraph corresponds to the termination of 917 jobs, driven by the Oil and Natural Gas Extraction Activities (-1,212 jobs, equivalent to -7.0%), as opposed to the increase of Activities to support oil and natural gas extraction (+295 stations, equivalent to + 2.0%) - the only activity within the oil chain that presented relevant positive results. While in Supply, the activity that most influenced the reduction of the link was the Manufacture of oil refinery products (-965 stations, equivalent to -6.2%). Finally, the Supply Chain is made up of only the activity of Manufacture of machinery and equipment for the exploration and extraction of oil, which had a reduction of 240 jobs in the period (-7.7%).

Regarding the profile of workers in Rio de Janeiro's oil chain, just over a quarter of the occupations are related to activities of the services and trade group (26.3%). Next, there are those requiring a higher level (representing 23.4% of the employees), occupations related to the production of industrial goods and services (18.9%) and, finally, occupations of a technical level, corresponding to 16.6% of professionals in the Rio de Janeiro chain.

It is important to point out that this distribution varies for the different links of the production chain, according to the essence of each one of the activities. In the Supply link, for example, employees that work in activities linked to services and trade (43.2%), as shown in the chain's total, prevail. However, in this link the concentration is more than 17 p.p. above, while Exploration & Production and the Supply Chain present higher concentration in the group of high-school level technicians, 29.5% and 35.3% respectively. The scientific professions appear as the second most relevant group in all the links (24.2% in Supply, 22.4% in E&P and 19.4% in the Supply Chain).

Regarding the occupations themselves, there is a great concentration in certain positions and almost half of the workers in the sector are distributed in only 10 occupations. The most present profession in the Rio de Janeiro oil chain is that of Gas Station Attendant: in Rio de Janeiro, 1 in 5 workers in the sector has this profession, accounting for 17.9 thousand in the entire state (21.2%). Then there are Oil Exploration Operators (4,261, equivalent to 5.0%) and Administrative Assistants (2,960, equivalent to 3.5%).

In order to understand the most frequent positions in the different levels of education, it is clear that among the most qualified occupations, which generally require a higher level, the most common are Administrators (1,817, equivalent to 2.2%) and industrial mechanical engineers (1,734, equivalent to 2.1%).

In occupations that require technical level of education, within the Rio de Janeiro oil chain, the most frequent are Mechanical Technicians (2,421, equivalent to 2.9%), Occupational Safety Technicians (1,536, equivalent to 1.8%) and Instrumentation Technicians (1,056, equivalent to 1.3%).

While in operational-level positions, in addition to the Oil Exploration Operators already mentioned in the 10 largest occupations in the sector (4,261, equivalent to 5.0%), there are Oil Platform Workers (1,245, equivalent to 1.5%) and Oil and Gas Well Drill Workers (792, equivalent to 0.9%).

Finally, for those activities related to services and sales, the highlights are Retailers (792, equivalent to 0.9%) and Car Washers (564, equivalent to 0.7%) - together with the abovementioned Gas Station Attendants 17,884, equivalent to 21.2%).

Regarding the demographic characteristics, the professionals of the chain are concentrated in the age groups between the age of 30 and 49 (56.3%), regardless of the link, and the level of education in Rio de Janeiro is much higher than that recorded in the national oil chain: in Rio de Janeiro, the percentage with higher education (38.2%) is more than double that recorded at the national level (14.4%), and, on the other hand, the concentration of workers with high school education is considerably higher in Brazil (57.9% versus 39.1% in RJ).

This difference in level of education in the Rio/Brazil oil chain is influenced by the Supply links and Supply chain, in which Rio de Janeiro's level of education is substantially higher than the Brazilian level: to illustrate, in Rio de Janeiro, 31.3% of workers in Supply have complete Higher education, compared to 10.4% in Brazil and in the link of the supply chain, the percentage of higher education is 40.0% in RJ and 25.3% in Brazil. In the E&P link, in turn, there are no significant disparities in the level of education of the country and state – in both locations about 50% of employees have at least Higher Education.

When it comes to the remuneration of workers in the oil sector, Rio de Janeiro is also prominent in comparison to other states and has the highest paid professionals in the country: the average salary of the Rio de Janeiro oil chain is R$ 11,374.00 – value 2.5 times higher than the national average (R$ 4,504) and almost twice the second highest remuneration in the country (Sergipe – R$ 6,358). This disparity of income is justified by two reasons. First, the Exploration & Production link is the highest paid in the oil sector both in Brazil (R$ 14,796) and in Rio (R$ 15,292) and, as seen, Rio de Janeiro is the state with the most workers in these activities. Another influential factor is the gap in remuneration observed mainly in the supply link: in these activities, the average monthly income in Rio de Janeiro is R$ 9,183 – almost three times higher than in Brazil (R$ 3,379).

Charts and tables

CHART 22. EVOLUTION OF COLLECTION FROM GOVERNMENT PARTICIPATIONS IN THE STATE AND MUNICIPALITIES OF RIO DE JANEIRO
Source: ANP, 2018.

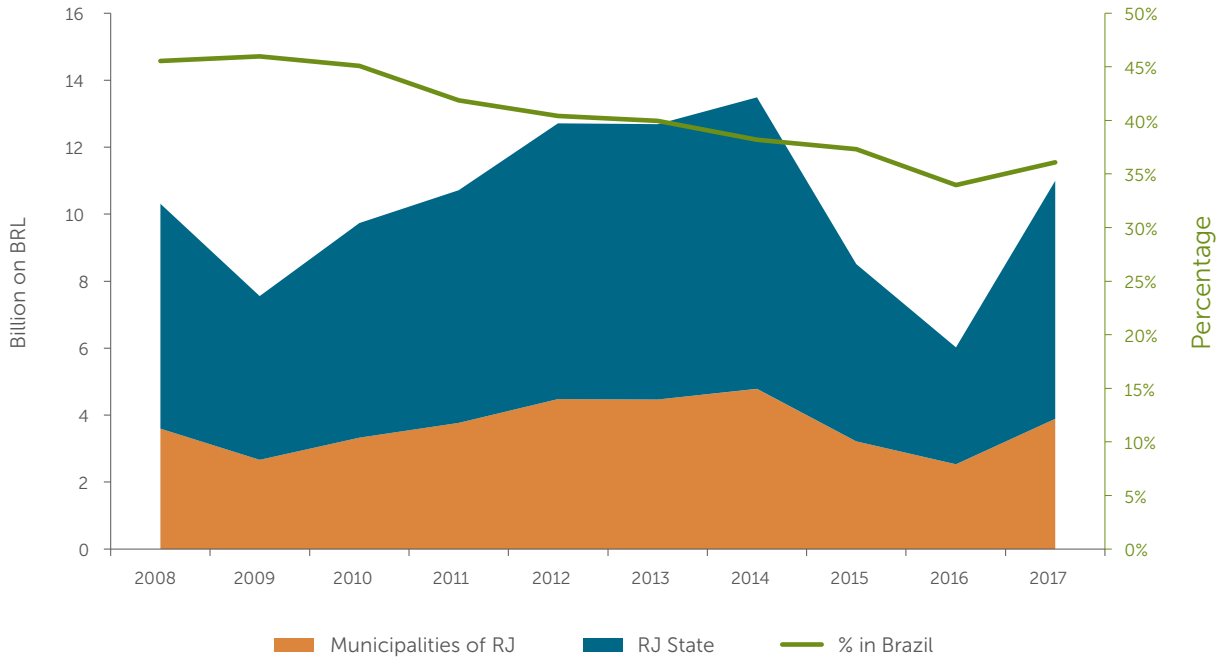


CHART 23. HISTORY OF TOTAL EMPLOYEES IN THE OIL PRODUCTION CHAIN
Source: ANP, 2018.

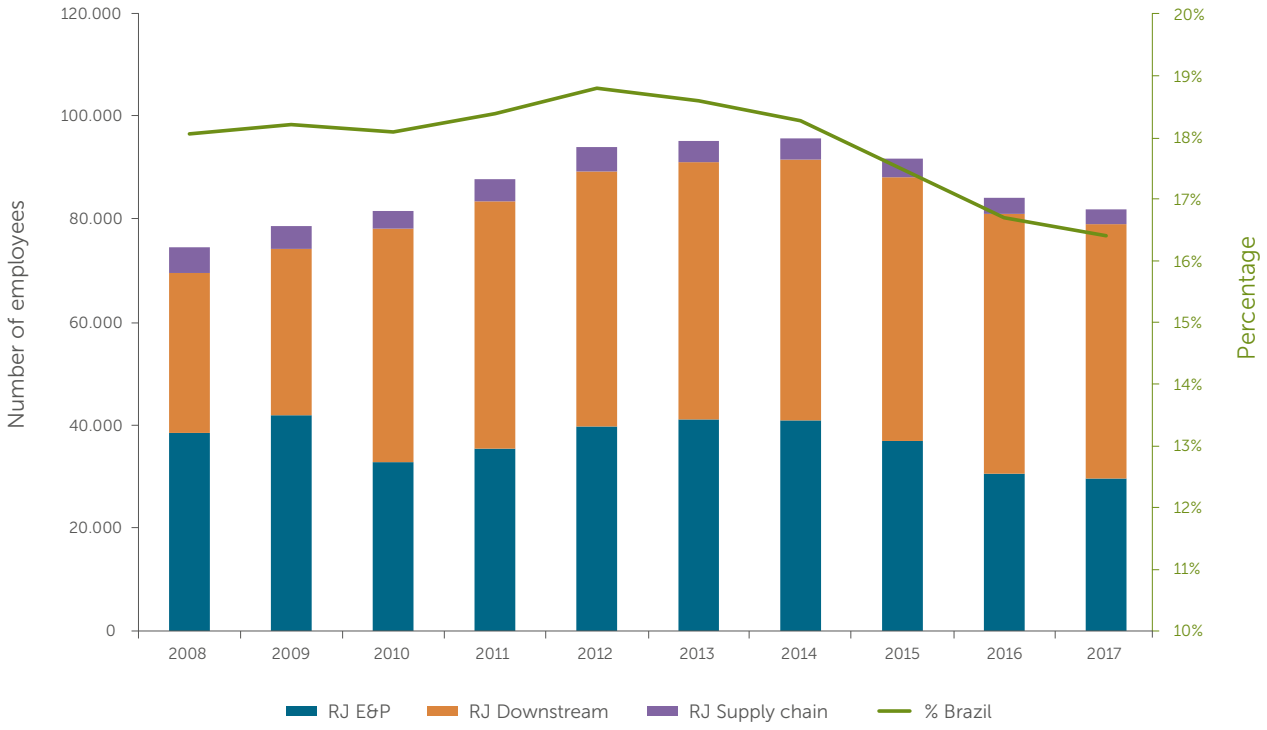


TABLE 16. EVOLUTION OF EMPLOYEES IN THE OIL PRODUCTION CHAIN

Source: Rais e Caged.

LINKS OF THE CHAIN	2006	2007	2008	2009	2010	2011
E&P	32.397	29.381	38.631	42.050	32.909	35.549
Downstream	29.948	31.368	31.152	32.476	45.560	48.196
Supply Chain	3.467	3.269	5.017	4.388	3.392	4.314
Total	**65.812**	**64.018**	**74.800**	**78.914**	**81.861**	**88.059**
% of Brazil in E&P	*63%*	*58%*	*61%*	*63%*	*64%*	*64%*
% of Brazil in the Downstream	*10%*	*10%*	*9%*	*9%*	*12%*	*12%*
% of Brazil in the Supply Chain	*69%*	*63%*	*72%*	*68%*	*56%*	*58%*
% of Brazil in the Total	*18%*	*17%*	*18%*	*18%*	*18%*	*18%*

TABLE 17. PROFESSIONAL INFORMATION ON THE OIL PRODUCTION CHAIN BY LARGE GROUPS

Source: Rais, 2018.

	DOWNSTREAM		E&P		SUPPLY CHAIN		TOTAL	
OCCUPATIONS - LARGE GROUPS	RJ	% IN THE RJ LINK	RJ	% IN THE RJ LINK	RJ	% IN THE RJ LINK	RJ	% IN THE RJ LINK
Services and sales	21.898	43,2%	312	1,0%	27	0,9%	22.237	26,3%
Scientific professions - higher education	12.279	24,2%	6.859	22,4%	605	19,4%	19.743	23,4%
Workers in the production of industrial goods and services	4.303	8,5%	9.594	31,3%	594	19,0%	14.491	17,2%
High school level technicians	3.883	7,7%	9.044	29,5%	1.104	35,3%	14.031	16,6%
Administrative services	4.737	9,3%	2.202	7,2%	492	15,7%	7.431	8,8%
Directors and managers	3.044	6,0%	1.781	5,8%	218	7,0%	5.043	6,0%
Maintenance and repair	533	1,1%	853	2,8%	85	2,7%	1.471	1,7%
Overall Total	**50.677**	**100,0%**	**30.645**	**100,0%**	**3.125**	**100,0%**	**84.447**	**100,0%**

2012	2013	2014	2015	2016	2017
39.895	41.274	41.044	37.053	30.651	29.734
49.713	50.124	50.872	51.386	50.691	49.611
4.751	4.141	4.148	3.685	3.125	2.885
94.359	**95.539**	**96.064**	**92.124**	**84.467**	**82.230**
63%	*66%*	*66%*	*65%*	*64%*	*65%*
12%	*11%*	*11%*	*11%*	*11%*	*11%*
59%	*50%*	*47%*	*34%*	*35%*	*35%*
19%	*19%*	*18%*	*18%*	*17%*	*16%*

TABLE 18. OTHER PROFESSIONAL INFORMATION ON THE OIL CHAIN

Source: Rais, 2018.

10 BIGGEST PROFESSIONS OF THE CHAIN	RJ	RJ IN TOTAL
Gas station attendant	17.884	21,2%
Oil exploration operator	4.261	5,0%
Administrative assistant	2.960	3,5%
Mechanical technician	2.421	2,9%
Administrator	1.817	2,2%
Industrial mechanical engineer	1.734	2,1%
Office assistant, in general	1.640	1,9%
Chemical engineer (oil and rubber)	1.638	1,9%
Occupational safety technician	1.536	1,8%
System development analyst	1.438	1,7%
AGE GROUP	**RJ**	**RJ IN TOTAL**
UNTIL 24	7.304	8,8%
25 TO 29	11.338	13,4%
30 TO 39	30.484	36,1%
40 TO 49	17.112	20,3%
50 TO 64	17.268	20,4%
65 OR MORE	961,0	1%

TABLE 19. HISTORY OF THE COLLECTION OF ROYALTIES AND SPECIAL PARTICIPATION IN THE STATE AND MUNICIPALITIES (MILLIONS ON BRL)

Source: ANP, 2018.

		2002	2003	2004	2005	2006	2007	2008
Total Government Participations	Municipalities of RJ (R$)	989,11	1.488,11	1.650,09	2.121,87	2.684,96	2.434,86	3.590,68
	RJ State (R$)	1.667,29	2.869,04	3.086,34	4.018,84	5.100,60	4.362,15	6.717,13
	Total Brazil (R$)	**5.694,17**	**9.393,81**	**10.314,80**	**13.173,08**	**16.543,53**	**14.668,15**	**22.647,70**
	% Brazil	*47%*	*46%*	*46%*	*47%*	*47%*	*46%*	*46%*
Special Participation	Municipalities of RJ (R$)	248,91	490,32	511,17	675,06	863,47	699,65	1.113,59
	RJ State (R$)	995,63	1.961,30	2.044,67	2.700,24	3.453,87	2.798,62	4.454,35
	Total Brazil (R$)	**2.510,18**	**4.997,43**	**5.271,98**	**6.967,00**	**8.839,99**	**7.177,53**	**11.710,79**
	% Brazil	*50%*	*49%*	*49%*	*49%*	*49%*	*49%*	*48%*
Royalties	Municipalities of RJ (R$)	740,21	997,79	1.138,92	1.446,81	1.821,49	1.735,21	2.477,09
	RJ State (R$)	671,66	907,74	1.041,66	1.318,60	1.646,73	1.563,53	2.262,77
	Total Brazil (R$)	**3.183,99**	**4.396,38**	**5.042,83**	**6.206,09**	**7.703,54**	**7.490,61**	**10.936,91**
	% Brazil	*44%*	*43%*	*43%*	*45%*	*45%*	*44%*	*43%*

TABLE 18 CONTINUED. OTHER PROFESSIONAL INFORMATION ON THE OIL CHAIN

Source: Rais, 2018.

LEVEL OF EDUCATION	RJ	RJ IN TOTAL
Illiterate	20	1,0%
Up to Some 5th grade	348	0,4%
Complete Elementary School 5th Grade	767	0,9%
6ª a 9ª Fundamental	1.738	2,1%
Complete Elementary School	8.231	9,7%
Some High School	3.687	4,4%
Complete High School	33.038	39,1%
Some Higher Education	1.909	2,3%
Complete Higher Education	32.264	38,2%
Masters	2.109	2,5%
Doctorate	356	0,4%
Average Yield	**R$ 11.374**	

2009	2010	2011	2012	2013	2014	2015	2016	2017
2.665,97	3.328,14	3.766,53	4.479,82	4.469,24	4.782,24	3.217,30	2.532,54	3.885,24
4.884,83	6.406,95	6.949,28	8.232,04	8.222,19	8.705,98	5.294,65	3.493,26	7.115,09
16.436,52	**21.600,00**	**25.629,47**	**31.491,27**	**31.805,81**	**35.358,51**	**25.174,07**	**17.739,39**	**30.469,85**
46%	*45%*	*42%*	*40%*	*40%*	*38%*	*34%*	*34%*	*36%*
793,86	1.095,08	1.112,48	1.317,11	1.310,04	1.373,05	746,47	408,31	1.084,51
3.175,45	4.380,34	4.480,24	5.268,45	5.240,16	5.492,21	2.985,88	1.507,27	4.464,03
8.452,81	**11.670,01**	**12.641,52**	**15.855,17**	**15.497,18**	**16.827,52**	**11.310,14**	**5.910,62**	**15.167,67**
47%	*47%*	*44%*	*42%*	*42%*	*41%*	*35%*	*32%*	*37%*
1.872,10	2.233,06	2.654,05	3.162,71	3.159,20	3.409,18	2.470,83	2.124,23	2.800,73
1.709,38	2.026,61	2.469,05	2.963,58	2.982,03	3.213,77	2.308,76	1.985,99	2.651,06
7.983,71	**9.929,99**	**12.987,95**	**15.636,10**	**16.308,62**	**18.530,98**	**13.863,93**	**11.828,77**	**15.302,18**
45%	*43%*	*39%*	*39%*	*38%*	*36%*	*39%*	*35%*	*36%*

TABLE 20. PAID GOVERNMENT PARTICIPATIONS BY FIELD AND COMPARISON BY MUNICIPALITY

Source: ANP, 2018.

FIELD	ROYALTIES	SPECIAL PARTICIPATION	TOTAL PAID GOV. PARTICIPATIONS BY THE FIELD	AVERAGE % BY CONFRONTATIONAL MUNICIPALITIES	
ALBACORA	283.690.365,52	27.107.856,55	310.798.222,07	CAMPOS DOS GOYTACAZES-RJ	65,0
				CARAPEBUS-RJ	3,2
				QUISSAMA-RJ	31,9
ALBACORA LESTE	260.017.123,43	39.829.663,85	299.846.787,28	CAMPOS DOS GOYTACAZES-RJ	69,4
				QUISSAMA-RJ	30,6
ANEQUIM	3.272.718,33	34.798.854,17	38.071.572,50	CAMPOS DOS GOYTACAZES-RJ	50,0
				MACAE-RJ	47,8
				RIO DAS OSTRAS-RJ	2,2
BAGRE	691.068,64	0,00	691.068,64	CAMPOS DOS GOYTACAZES-RJ	50,0
				MACAE-RJ	29,6
				RIO DAS OSTRAS-RJ	20,4
BARRACUDA	296.219.514,83	18.739.640,07	314.959.154,90	CABO FRIO-RJ	8,7
				CAMPOS DOS GOYTACAZES-RJ	50,0
				CASIMIRO DE ABREU-RJ	18,2
				RIO DAS OSTRAS-RJ	23,2
BIJUPIRÁ	54.060.134,36	0,00	54.060.134,36	CABO FRIO-RJ	50,0
				CAMPOS DOS GOYTACAZES-RJ	50,0
BONITO	24.612.594,35	0,00	24.612.594,35	ARMACAO DOS BUZIOS-RJ	24,1
				CABO FRIO-RJ	25,9
				CAMPOS DOS GOYTACAZES-RJ	47,6
				QUISSAMA-RJ	2,4
BÚZIOS	13.030.391,18	0,00	13.030.391,18	SAQUAREMA-RJ	37,5
				MARICA-RJ	62,5
CARAPEBA	37.783.985,74	0,00	37.783.985,74	CAMPOS DOS GOYTACAZES-RJ	50,0
				CARAPEBUS-RJ	34,6
				MACAE-RJ	4,1
				QUISSAMA-RJ	11,3
CARATINGA	156.349.815,47	600.539,52	156.950.354,99	ARMACAO DOS BUZIOS-RJ	3,3
				CABO FRIO-RJ	45,7
				CAMPOS DOS GOYTACAZES-RJ	50,0
				CASIMIRO DE ABREU-RJ	1,0
CHERNE	41.354.063,19	0,00	41.354.063,19	CAMPOS DOS GOYTACAZES-RJ	50,0
				RIO DAS OSTRAS-RJ	50,0
CONGRO	8.455.467,72	0,00	8.455.467,72	CABO FRIO-RJ	5,3
				CAMPOS DOS GOYTACAZES-RJ	50,0
				CASIMIRO DE ABREU-RJ	11,5
				RIO DAS OSTRAS-RJ	33,2
CORVINA	5.610.061,47	0,00	5.610.061,47	CABO FRIO-RJ	6,0
				CAMPOS DOS GOYTACAZES-RJ	50,0
				CASIMIRO DE ABREU-RJ	19,8
				RIO DAS OSTRAS-RJ	24,3
ENCHOVA	14.992.241,20	0,00	14.992.241,20	CABO FRIO-RJ	44,9
				CAMPOS DOS GOYTACAZES-RJ	49,3
				CASIMIRO DE ABREU-RJ	5,1
				QUISSAMA-RJ	0,7
ENCHOVA OESTE	14.133.455,28	0,00	14.133.455,28	ARMACAO DOS BUZIOS-RJ	3,4
				CABO FRIO-RJ	46,6
				CAMPOS DOS GOYTACAZES-RJ	16,2
				QUISSAMA-RJ	33,8
ESPADARTE	13.385.025,34	0,00	13.385.025,34	ARARUAMA-RJ	0,5
				ARMACAO DOS BUZIOS-RJ	16,9
				ARRAIAL DO CABO-RJ	0,8
				CABO FRIO-RJ	27,9
				CAMPOS DOS GOYTACAZES-RJ	44,5
				MARICA-RJ	3,4
				NITEROI-RJ	0,9
				QUISSAMA-RJ	4,1
				RIO DE JANEIRO-RJ	0,9
				SAQUAREMA-RJ	0,2
FRADE	108.603.497,33	0,00	108.603.497,33	PRESIDENTE KENNEDY-ES	100,0
				SAO JOAO DA BARRA-RJ	20,0
				CAMPOS DOS GOYTACAZES-RJ	80,0
GAROUPA	16.511.820,90	0,00	16.511.820,90	CAMPOS DOS GOYTACAZES-RJ	50,0
				CARAPEBUS-RJ	1,7
				MACAE-RJ	48,3
GAROUPINHA	1.376.326,59	0,00	1.376.326,59	CAMPOS DOS GOYTACAZES-RJ	50,0
				MACAE-RJ	50,0
ITAPU	106.623.443,84	0,00	106.623.443,84	MARICA-RJ	100,0
LINGUADO	95.876,24	0,00	95.876,24	ARMACAO DOS BUZIOS-RJ	32,5
				CABO FRIO-RJ	17,5
				QUISSAMA-RJ	50,0
LULA	4.748.880.161,45	7.067.989.624,26	11.816.869.785,71	RIO DE JANEIRO-RJ	43,1
				NITEROI-RJ	48,9
				MARICA-RJ	8,0
MALHADO	5.133.346,18	0,00	5.133.346,18	CABO FRIO-RJ	1,7
				CAMPOS DOS GOYTACAZES-RJ	50,0
				CASIMIRO DE ABREU-RJ	12,8
				RIO DAS OSTRAS-RJ	35,5

TABLE 20 CONTINUED. PAID GOVERNMENT PARTICIPATIONS BY FIELD AND COMPARISON BY MUNICIPALITY

Source: ANP, 2018.

FIELD	ROYALTIES	SPECIAL PARTICIPATION	TOTAL PAID GOV. PARTICIPATIONS BY THE FIELD	AVERAGE % BY CONFRONTATIONAL MUNICIPALITIES	
MARIMBÁ	74.903.345,92	0,00	74.903.345,92	ARMACAO DOS BUZIOS-RJ	6,1
				CABO FRIO-RJ	43,9
				CAMPOS DOS GOYTACAZES-RJ	50,0
MARLIM	775.331.447,94	330.168.071,37	1.105.499.519,31	CAMPOS DOS GOYTACAZES-RJ	50,0
				MACAE-RJ	20,4
				RIO DAS OSTRAS-RJ	29,6
MARLIM LESTE	383.161.573,42	12.027.121,92	395.188.695,34	CAMPOS DOS GOYTACAZES-RJ	50,0
				CARAPEBUS-RJ	1,6
				CASIMIRO DE ABREU-RJ	1,3
				MACAE-RJ	20,7
				RIO DAS OSTRAS-RJ	26,4
MARLIM SUL	941.397.126,31	585.973.164,57	1.527.370.290,88	ARMACAO DOS BUZIOS-RJ	4,4
				CABO FRIO-RJ	28,1
				CAMPOS DOS GOYTACAZES-RJ	50,0
				CASIMIRO DE ABREU-RJ	6,3
				RIO DAS OSTRAS-RJ	11,2
NAMORADO	40.105.579,58	0,00	40.105.579,58	CAMPOS DOS GOYTACAZES-RJ	50,0
				MACAE-RJ	3,7
				RIO DAS OSTRAS-RJ	46,3
PAMPO	65.953.036,25	0,00	65.953.036,25	ARMACAO DOS BUZIOS-RJ	21,0
				CABO FRIO-RJ	29,0
				QUISSAMA-RJ	50,0
PAPA-TERRA	48.037.376,35	0,00	48.037.376,35	CABO FRIO-RJ	46,7
				ARMACAO DOS BUZIOS-RJ	53,3
PARATI	1.271.554,80	0,00	1.271.554,80	CAMPOS DOS GOYTACAZES-RJ	50,0
				CARAPEBUS-RJ	3,0
				MACAE-RJ	46,3
				RIO DAS OSTRAS-RJ	0,6
PARGO	12.286.422,12	0,00	12.286.422,12	CAMPOS DOS GOYTACAZES-RJ	50,0
				CARAPEBUS-RJ	32,7
				QUISSAMA-RJ	17,3
PEREGRINO	334.271.640,23	0,00	334.271.640,23	MACAE-RJ	9,9
				RIO DAS OSTRAS-RJ	6,7
				CASIMIRO DE ABREU-RJ	30,8
				CABO FRIO-RJ	5,9
				ARMACAO DOS BUZIOS-RJ	0,7
				ARRAIAL DO CABO-RJ	40,5
				PARATI-RJ	5,5
PIRAÚNA	2.027.913,18	0,00	2.027.913,18	CABO FRIO-RJ	50,0
				CAMPOS DOS GOYTACAZES-RJ	50,0
POLVO	41.230.506,46	0,00	41.230.506,46	PARATI-RJ	3,9
				ITAGUAI-RJ	0,2
				RIO DE JANEIRO-RJ	2,5
				CARAPEBUS-RJ	47,4
				MANGARATIBA-RJ	43,5
				QUISSAMA-RJ	2,5
RONCADOR	1.403.266.255,58	1.230.753.109,64	2.634.019.365,22	PRESIDENTE KENNEDY-ES*	100,0
				CAMPOS DOS GOYTACAZES-RJ	68,2
				SAO JOAO DA BARRA-RJ	31,8
SALEMA	21.315.681,55	0,00	21.315.681,55	CABO FRIO-RJ	50,0
				CAMPOS DOS GOYTACAZES-RJ	50,0
SAPINHOÁ	1.382.939.165,89	2.115.082.136,04	3.498.021.301,93	ILHABELA-SP**	100,0
				RIO DE JANEIRO-RJ***	100,0
TAMBAÚ	777.635,06	0,00	777.635,06	MARICA-RJ	100,0
TARTARUGA VERDE	57.131.931,28			ARRAIAL DO CABO-RJ	2,2
				ARARUAMA-RJ	1,5
				CABO FRIO-RJ	5,6
				MARICA-RJ	20,6
				NITEROI-RJ	11,3
				QUISSAMA-RJ	37,2
TUBARÃO MARTELO	36.430.309,29	0,00	36.430.309,29	PARATI-RJ	13,5
				MACAE-RJ	36,5
				CARAPEBUS-RJ	50,0
URUGUÁ	74.582.006,09	0,00	74.582.006,09	MARICA-RJ	100,0
VERMELHO	19.406.448,16	0,00	19.406.448,16	CAMPOS DOS GOYTACAZES-RJ	50,0
				QUISSAMA-RJ	50,0
VIOLA	7.165.521,38	0,00	7.165.521,38	CAMPOS DOS GOYTACAZES-RJ	50,0
				CARAPEBUS-RJ	1,8
				MACAE-RJ	36,4
				RIO DAS OSTRAS-RJ	11,7
VOADOR	12.697.373,03	0,00	12.697.373,03	CAMPOS DOS GOYTACAZES-RJ	50,0
				MACAE-RJ	45,3
				RIO DAS OSTRAS-RJ	4,7

*Average percentage of Roncador field from the production witin Espirito Santo's state offshore limits that confronts the municipalitie.
**Average percentage of Sapinhoá field from the production witin São Paulo's state offshore limits that confronts the municipalitie.
***Average percentage of Sapinhoá field from the production witin Rio de Janeiro's state offshore limits that confronts the municipalitie.

TABLE 21. EXPORT OF THE OIL MARKET IN US$ AND % OF BRAZIL

Source: Secex/MDIC.

YEAR	TOTAL	CRUDE OIL	COKE AND PETROLEUM DERIVATIVES	PRODUCTS OF PETROCHEMICAL ORIGIN	REPETRABLE PRODUCTS		
					FLOATING PLATFORMS AND VESSELS	OTHER REPETRABLE PRODUCTS	TOTAL REPETRO PRODUCTS
2007	10.087,7	8.410,0	865,8	247,6	555,7	8,6	564,3
2008	13.845,1	12.515,7	1.092,5	226,9	0,0	10,0	10,0
2009	10.089,5	9.046,9	822,4	181,1	0,0	39,2	39,2
2010	15.890,1	14.929,4	811,7	146,0	0,0	3,0	3,0
2011	22.596,3	19.979,2	858,4	275,9	1.042,7	440,1	1.482,8
2012	21.984,5	18.467,2	1.755,8	240,5	670,1	851,0	1.521,1
2013	15.032,5	11.709,6	1.218,1	159,9	1.430,3	514,6	1.944,9
2014	16.374,7	12.944,5	829,4	150,8	1.982,9	467,0	2.450,0
2015	11.647,9	8.965,4	462,9	171,6	1.527,9	520,2	2.048,0
2016	12.136,0	7.955,5	230,3	227,4	3.255,7	467,3	3.722,9
2017	15.187,0	13.122,5	558,0	189,0	903,8	413,7	1.317,5
				% BRAZIL			
2007	59%	94%	20%	12%	82%	1%	32%
2008	60%	91%	22%	12%	0%	1%	0%
2009	63%	97%	26%	9%	0%	3%	3%
2010	69%	92%	26%	7%	0%	0%	0%
2011	72%	92%	19%	10%	98%	29%	57%
2012	69%	91%	32%	9%	46%	44%	45%
2013	51%	90%	26%	7%	18%	28%	20%
2014	60%	79%	20%	6%	99%	22%	60%
2015	58%	76%	24%	7%	79%	27%	53%
2016	63%	79%	17%	9%	89%	28%	70%
2017	64%	79%	28%	72%	100%	25%	52%

TABLE 22. IMPORT OF THE OIL MARKET IN US$ AND % OF BRAZIL

Source: Secex/MDIC.

YEAR	TOTAL	CRUDE OIL	COKE AND PETROLEUM DERIVATIVES	PRODUCTS OF PETROCHEMICAL ORIGIN	REPETRABLE PRODUCTS		
					FLOATING PLATFORMS AND VESSELS	OTHER REPETRABLE PRODUCTS	TOTAL REPETRO PRODUCTS
2007	2.819,3	2.264,3	270,2	115,7	3,3	165,7	169,0
2008	4.753,0	3.834,4	433,4	190,8	1,0	293,3	294,4
2009	2.857,6	2.177,1	242,6	145,4	22,6	269,9	292,5
2010	3.796,1	2.588,9	646,1	213,7	22,1	325,3	347,4
2011	4.921,6	3.561,3	670,7	253,5	2,1	434,1	436,2
2012	5.104,8	3.940,5	466,0	257,1	6,3	434,8	441,1
2013	4.257,1	2.964,7	407,0	261,3	4,6	619,5	624,2
2014	5.219,0	3.694,4	327,9	274,4	390,0	532,4	922,4
2015	4.018,5	2.026,7	235,8	208,9	1.157,8	389,3	1.547,1
2016	2.294,3	999,5	227,7	206,6	627,3	233,1	860,5
2017	2.238,3	1.473,9	337,6	188,8	1,7	236,3	238,0
				% BRAZIL			
2007	13%	19%	4%	4%	85%	13%	13%
2008	15%	23%	4%	5%	39%	16%	16%
2009	15%	24%	5%	5%	33%	17%	18%
2010	13%	26%	5%	5%	89%	16%	16%
2011	12%	25%	4%	5%	60%	18%	18%
2012	13%	29%	3%	5%	33%	17%	17%
2013	10%	18%	2%	4%	13%	20%	20%
2014	12%	24%	2%	5%	83%	18%	27%
2015	16%	27%	3%	5%	93%	17%	43%
2016	14%	34%	3%	5%	100%	12%	33%
2017	11%	50%	28%	48%	68%	16%	16%

FINAL CONSIDERATIONS

OIL MARKET: CATALYST OF A PRO-DEVELOPMENT CYCLE

Sistema FIRJAN's article

The wheel has turned again and the oil and gas market in Brazil already has a more positive outlook of the future. And, in this new scenario, Rio de Janeiro once again played a leading role.

In addition to the projects under development, this could be clearly seen with the result of the 15th Bidding Round for Exploratory Blocks, conducted by ANP. The state of Rio de Janeiro was the highlight, with the highest volume of signature bonus collection, totaling 98% of the revenue, occurred in the areas acquired in Rio de Janeiro waters, with 80% of the 15 blocks offered in the state.

In the short term, these opportunities result in investment mainly in increasing the geological knowledge of our areas. On the other hand, it is only with the continuous supply of new areas that we will be able to give the sustainability of the necessary investment and return to society.

Thus, the exploratory areas offered in 2018 may require demands of around US$ 500 million in geophysical data collection and processing; drilling, profiling, cementation and completion of wells; seismic studies; and chartering and operation of special vessels (drills and sea support).

Still on E&P, supporting in the short term, until 2021, 12 offshore production systems are scheduled to enter into operation in the state of Rio de Janeiro. These projects, besides boosting the economy of the state and the country, with the demand for goods and services and generation of jobs, will also support the future production curve and all its beneficial effects for society, whether in the form of government collections or in jobs in the investment phase and in the consequent operation of these assets.

In this case, if we disregard projects that have already begun contracting or building of assets, there will be another US$ 40 billion in investment.

For the supply segment, in view of the supply crisis that we experienced in the middle of May 2018, and in order to boost the domestic economy, the Legislative Assembly of the State of Rio de Janeiro - ALERJ, approved the equalization of the ICMS Tax rate of diesel to our neighboring states in the southeast region. Still in the downstream segment, we had the resumption of contracting for completion of the Petrochemical Complex of Rio de Janeiro.

On the one hand, we advance in downstream, but we still need to work hard to build our capacity to add value to our oil extraction activities. It is important to stress that this expansion of our refining capacity must be accompanied by an increase in the number of agents acting in this segment of the market. Only then, we will be able to implement instruments that stimulate gains in efficiency and productivity that only a competitive market can foster.

Thus, what is evident when evaluating the oil market is that Exploration and Production is the starting point of the gains, but it is not the only one. This segment should then be used as a generator and booster of the results, all those upstream, downstream and also those areas which, at first, are not related.

So the key question is how can we make the implementation of E&P projects faster and also maximize returns to the country. And this is where investment in Research, Development and Innovation stands out.

For oil company investments,the R,D&I financial resources is a way of shortening the implementation times of projects through internal gains in competitiveness. For the supply chain, we must use the strength of E&P to work all the bottlenecks that prevent the continuous improvement of our competitiveness. For this, it is important for the companies operating in this segment to also be closer to the reality of the Brazilian goods and services suppliers, especially those smaller companies with reduced investment capacity.

In such cases, the partnership with international companies, would not only boost our competitiveness, but also put us in a more advanced position for international operations and expansion for supply to other markets. We will thus have diversity of buyers and greater sustainability of our industrial activities.

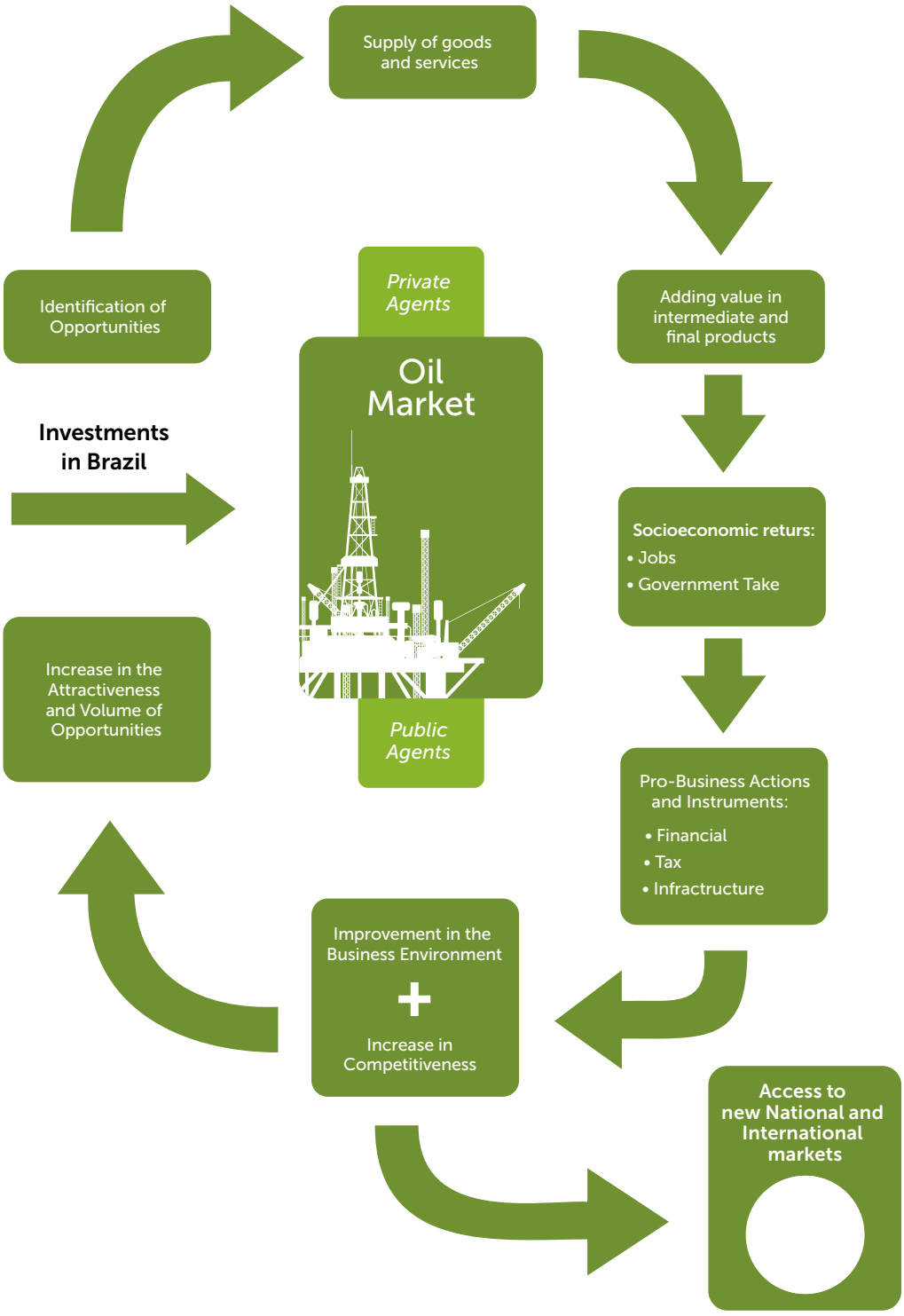
In addition, the proactive performance of government entities should be aimed at providing investors with the business environment conducive to making the wheels turn not only faster but also with lower levels of intercurrence. Therefore, the correct signals to the market and the availability of various convergent and aligned instruments are necessary for competitiveness gains, including financing, tax, environmental and infrastructure issues.

We will thus be using oil as a driver of our productive capacities, and we will be building a country focused on the ability to adapt and be included in the global economy with greater sustainability.

The FIRJAN System thus believes in a vision of a Country Pro-Development Cycle, with the oil market as a catalyst, as shown in Figure 2. Therefore, we work to identify, with the main agents of this market, which wheels are the ones that hold and which push the development of Rio de Janeiro and Brazil.

It is with this objective that FIRJAN acts to bring the opportunities closer to the market's reality, and through the **Rio de Janeiro Oil Industry Yearbook**, today in its third edition, to bring together in a single document a qualified, quantified evaluation and guide for the decision-making of these agents that build one of the most important pillars of the economy of the state and country: the oil.

FIGURE 2. COUNTRY PRO-DEVELOPMENT CYCLE – OIL MARKET AS CATALYST
Source: Own elaboration.



APPENDIX

GLOSSARY

A

Anhydrous Fuel Ethanol: ethyl alcohol intended to make up the mixture with gasoline A in the formulation of gasoline C in a proportion defined by applicable legislation.
API Grade: scale created by the American Petroleum Institute (API) and the National Bureau of Standards, to measure the relative density of liquids.
Asphalt: petroleum derivative, made up of heavy hydrocarbons and regulated by ANP Resolution no. 2, of 01/14/2005.
Aviation Gasoline: oil derivative used as fuel for aircraft with spark ignition engines. It is currently regulated by ANP Resolution no. 17, dated 07/26/2006.
Aviation Kerosene (AVK): oil derivative used as fuel in aircraft turbines. It is currently regulated by ANP Resolution no. 37, dated 12/1/2009.

B

Barrel of oil equivalent (boe): unit of energy equivalence, used to represent different energy sources according to the energy value contained in one barrel of oil.
Barrel per day (bpd): unit used to refer to the daily production of oil barrels.
Bidding Round: action organized by ANP, whose objective is the auction between companies and consortiums interested in acquiring exploratory areas in concessions or sharing.
Biofuel: substance obtained from renewable biomass, used in the generation of energy.
Biodiesel: fuel produced from vegetable oils extracted from various raw materials. Currently, by determination of the ANP, biodiesel is being added in the proportion of 5% to diesel of fossil origin.
Brent: basket of oils produced in the North Sea, having API grade of 39.4º, sulfur content of 0.34% and coming from the *Brent* and *Ninian* oil systems.

C

Commodity: term that designates a specific and standardized good in its raw state, which has commercial importance worldwide, such as coffee, cotton, petroleum, metallic and non-metallic minerals, among others. These goods are traded on commodities and futures exchanges.
Concession: model of concession of an area for exploration and production of oil and natural gas for an operating company or exploration consortium, held through an open bidding round, organized by ANP.
Consortium: a group of companies that acquire an area to carry out oil and/or natural gas exploration and production activities.
Cracking: hydrocarbon refining process, aimed at reducing larger and more complex molecules into simpler and lighter molecules to increase the proportion of lighter and more volatile products. This process can be carried out by thermal or catalytic means.

D

Deep waters: oceanic waters located at any distance from the coast with depth of the seabed of 300-1,500 meters.

Diesel Oil: oil derivative, used as fuel in automobiles, buses, SUVs (Sport Utility Vehicle), vans, trucks, small sea vessels, large machines, locomotives, ships and electric generators, among others.

Distributor: agent, whose activity is characterized by the purchase and resale of products such as fuels, lubricants, asphalts, other oil derivatives, natural gas and bottled liquefied gas (LPG) carried out by specialized companies, in bulk (by wholesale) for the retail network or large consumers.

Downstream: refers to the transportation and distribution of products of the oil industry, from the refinery to the distribution companies (in the case of natural gas and liquefied petroleum gas, for example) or to points of sale to the final consumer (gasoline, aviation kerosene, diesel oil, lubricants, etc.) or to industrial establishments (manufacturers of synthetic rubber, plastics, fertilizers, antifreeze, pesticides, pharmaceutical products, etc.).

E

Ethanol: liquid biofuel derived from renewable biomass, mainly composed of ethyl alcohol, and which can be used in spark-ignited internal combustion engines, in other forms of energy generation or in the petrochemical industry. It is currently regulated by Law no. 12490, dated 09/16/2011.

Exploratory Block: geographically delimited areas related to a sedimentary basin, where oil and natural gas exploration activities are carried out, by the Concession, Sharing or Onerous Assignment model.

Exploratory Well: well drilled for the conduction of geological studies to verify the conditions of the explored reservoir.

F

Field: area producer of oil or natural gas, coming from one or more exploratory blocks, from reservoirs located in different geological horizons.

Fuel Oil: petroleum derivative made up of heavier fractions from the atmospheric distillation of oil, which is widely used as industrial fuel in boilers and kilns.

G

Gasoline A: petroleum derivative free of oxygenated components and used fuel in automotive vehicles equipped with spark ignition engines. It is currently regulated by ANP Resolution no. 40, dated 10/25/2013.

Gasoline C: fuel obtained from the mixture of gasoline A and anhydrous ethanol fuel, in the proportions defined by the legislation in force. It is currently regulated by ANP Resolution no. 40, dated 10/25/2013.

Government Participations: refers to all financial or physical appropriations that the government makes in accordance with the production of oil and/or natural gas. Currently, they are government participations in royalties, special participation, payment for area retention and percentage of surplus in oil - in the case of sharing.

H

Hydrocarbon: chemical compound consisting solely of carbon and hydrogen atoms. Petroleum and natural gas are examples of hydrocarbons.

Hydrous Ethanol Fuel (EHC): hydrous ethyl alcohol fuel or hydrous ethanol fuel is the ethanol intended for sale at the dealer point for the final consumer in motor vehicles. It is currently regulated by ANP Resolution no. 7, dated 02/09/2011 and also by ANP Resolution no. 7, dated 02/21/2013.

I

Injector Well: every well that has the injection of different substances to stimulate the production of hydrocarbons as purpose.

K

Kerosene: petroleum derivative consisting of hydrocarbon fractions following gasoline and prior to diesel in the distillation of oil, and which can be used as jet fuel (see Aviation Kerosene), domestic heating, lighting – Illuminating Kerosene, solvents and insecticides.

L

Liquefied Petroleum Gas (LPG): Mixture of hydrocarbons with high vapor pressure, obtained from natural gas in special process units, maintained in the liquid phase under special surface storage conditions.

Lubricating Oil: oil derivative commonly used to reduce friction and wear of parts and equipment.

M

Midstream: segment of the oil value chain that includes refining activities.

Mining or Production: set of coordinated operations aimed at the extraction of oil and/or natural gas from a reservoir, as well as its preparation for movement. Oil production activities were regulated by Law No. 9478, dated 08/06/1997.

Multiplier Effect: effect observed when an investment generates a final added value greater than the one initially applied. This increase occurs because investment generates jobs and increases the purchasing power of individuals, and as a result stimulates the demand for various goods and services of the economy. An example can be seen when the establishment of the oil industry in a municipality ends up also stimulating trade and investments in infrastructure, among others.

N

Naphtha: petroleum product used as raw material of the petrochemical industry for the production of ethene and propene, in addition to other liquid fractions such as benzene, toluene and xylenes. Naphtha can also be used to generate gas for domestic use through an industrial process.

National Oil, Natural Gas and Biofuel Agency (ANP): body that regulates the oil, natural gas and biofuel market in Brazil. It is worth mentioning that the matters related to the distribution of natural gas are subject to state regulation (see Agenersa).

Natural gas: hydrocarbons remaining in the gaseous state under normal atmospheric conditions of temperature and pressure.
Natural Vehicle Gas (NVG): nomenclature given for the use of natural gas in order to be a fuel in motor vehicles.

O

Offshore: term meaning located in the sea.
Oil, Crude Oil or Raw Oil: see Petroleum.
Onerous Assignment: model for the assignment of an exploratory area to Petrobras - bilateral negotiation, by means of counterpart of the payment of a certain amount, which was regulated by Law 12276, dated June 30, 2010, limiting the exploitation to up to 5 billion boe.
ONIP: National Oil Industry Organization.
Onshore: term meaning located on land.
Operating Company: company responsible for conducting and performing exploration and production activities in the area, following the parameters established in the concession, sharing or onerous assignment entered into with ANP.
Organization of the Petroleum Exporting Countries (Opec): a multinational organization made up of Angola, Algeria, Libya, Nigeria, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates, Ecuador and Venezuela, established in 1960 to coordinate the oil policies of its members.

P

Paraffin: oil derivative made up of paraffinic solid hydrocarbons obtained in the process from lubricating oils, being widely used in the candle, paper, tarpaulin, battery, dry cell, dairy product industries, meat plants and some chemical products.
Petroleum: any liquid hydrocarbon in its natural state, such as crude and condensed oil, whose exploration and production is regulated by Law 9478 of 08/06/1997.
Petroleum Coke: oil derivative from the petroleum resulting from the process of cracking heavy residues (coking), consisting of 90-95% of carbon. It is commonly used in the manufacture of calcined coke by the aluminum industry and the manufacture of electrodes, in the production of steel coke, for example.
Petroleum Derivatives: products from processes aimed at physicochemical transformation of oil.
Pre-salt: geological formation located beneath the salt layer.
Probable Reserves: volume of oil and/or natural gas with a lower recovery estimate than proven reserves.
Production Sharing: oil, natural gas exploration and production model, which provides for not only the payment of royalties but also the physical division of hydrocarbon production minus the cost incurred in exploration and production activities. It is currently regulated by Law no. 12351, dated 12/22/2010.
Production Well: is the well that aims to exploit the hydrocarbon resources found in the reservoirs and considered commercial.

Possible Reserves: volume of oil and/or natural gas which, from the analysis of geo-scientific data, is indicated as less likely to recover than the probable and proven reserves.
Post-salt: geological formation located above the salt layer.
Proven Reserves: volume of oil and/or natural gas with a high degree of certainty that the quantity to be recovered will be at least 90% of the estimated value.

R

Refining or Refinement: set of processes whose purpose is the transformation of petroleum into byproducts, called petroleum derivatives.
Repetro: is a special customs regime for the export and import of goods to be used for survey and mining of oil and natural gas deposits.
Reserves: volumes of oil and natural gas considered to be commercially recoverable, commonly categorized according to the degree of certainty about the recovery of these volumes.
Reservoir: geological formation with specific oil and/or natural gas storage properties.
Round Zero: the first round of bidding conducted under Article 34 of the Petroleum Law, on August 6, 1998, for Petrobras to sign concession contracts for those fields that were in production. For blocks with commercial discoveries, the company was guaranteed its rights to continue exploration and development activities.
Royalties: financial compensation paid monthly by concessionaires, regardless of the volume of production in the field. The funds obtained are distributed among States, Municipalities, the Brazilian Navy Command, Ministry of Science and Technology and the Special Fund, administered by the Ministry of Finance.

S

S-10 Diesel Oil: variation of diesel oil, which is passed by processes to reduce the sulfur content, maximum limit of 10 mg/kg. Currently regulated by ANP Resolution no. 50, dated 12/23/2013.
Sedimentary Basin: geological formation where sedimentary rocks accumulate, where fossil resources such as oil and natural gas, and aquifer may or may not be found.
Shale: refers to an unconventional oil produced from fragments of bituminous shale and through pyrolysis, hydrogenation or thermal dissolution. These processes convert the organic matter inside the rock (kerogen) into synthetic oil and gas.
Shallow waters: oceanic waters located at any distance from the coast with depth of the seabed of 0-300 meters.
Solvent: petroleum derivative in liquid form used as dissolvent for solid and/or liquid substances.
Special Participation: extraordinary financial compensation owed by the oil and/or natural gas concessionaires in cases of large production volume, which is assessed on a quarterly basis. Special participation is currently regulated by Decree no. 2705, dated 08/03/1998.
Special Well: well that aims to allow the carrying out of specific operations, which does not fit the definitions of exploratory or production wells.
Survey or Exploration: activities to evaluate the area, aiming at the identification of reservoirs with evidence of hydrocarbons.

T

TCF (Trillion Cubic Feet): a volumetric series commonly used to measure the volume of natural gas production and reserves.

Total Reserves: sum of estimated volumes to be recovered from proven, probable and possible reserves.

U

Ultra-deep waters: oceanic waters located at any distance from the coast with depth of the seabed of more than 1,500 meters.

Upstream: the upstream segment of the oil value chain encompasses all stages from the preliminary exploration to the extraction and transportation of the resource.

V

Value chain: set of several production stages that add value to the final product marketed, considering production of the raw material as the start.

W

WTI (West Texas Intermediate): reference price for contracts for the purchase and sale of oil widely used in the Atlantic Basin, based on the quality of crude oil produced in Texas.

APPENDIX

MAIN REGULATIONS IN 2017

COMPLEMENTARY LAW Nº. 160, OF 08/07/2017 – FEDERAL OFFICIAL GAZETTE (DOU) 08/08/2017 - Drafts an agreement that allows States and the Federal District to deliberate on the remission of tax credits, constituted or not, resulting from tax or financial-tax exemptions, incentives and benefits established in disagreement with the provisions of item "g" of subsection XII of paragraph 2 of art. 155 of the Federal Constitution, and the reinstitution of the respective tax or financial-tax exemptions, incentives and benefits; and amends Law Nº. 12.973 of May 13, 2014.

LAW Nº. 13.540, OF 12/18/2017 - FEDERAL OFFICIAL GAZETTE 12/19/2017 – Amends Laws Nºs. 7.990, dated December 28, 1989, and 8.001, dated March 13, 1990, to dispose on the Financial Compensation for the Exploration of Mineral Resources (CFEM).

LAW Nº. 13.576, OF 12/26/2017 – FEDERAL OFFICIAL GAZETTE 12/27/2017 – Drafts the National Biofuel Policy (RenovaBio) and gives other provisions.

LAW Nº. 13.586, OF 12/28/2017 – FEDERAL OFFICIAL GAZETTE 12/29/2017 – Drafts the tax treatment of exploration and development activities in the oil or natural gas field; establishes a special tax regime for the exploration, development and production of oil, natural gas and other fluid hydrocarbons; amends Laws Nºs. 9.481 of August 13, 1997 and 12.973 of May 13, 2014; and revokes Decree-Law Nº. 62, of November 21, 1966.

DECREE Nº. 9.041, OF 05/02/2017 – FEDERAL OFFICIAL GAZETTE 05/03/2017 – Regulates Law Nº. 12.351, dated December 22, 2010, to dispose on the preemptive rights for Petróleo Brasileiro S.A. - Petrobras to act as operator in the consortiums formed for the exploration and production of blocks to be contracted under the production sharing regime.

DECREE Nº. 9.042, of 05/02/2017 - FEDERAL OFFICIAL GAZETTE 05/03/2017 – Amends Decree Nº. 2.705, of August 3, 1998, which defines criteria for calculation and collection of government participations referred to in Law Nº. 9.478, of August 6, 1997, applicable to oil and natural gas exploration, development and production activities.

DECREE Nº. 9.082, OF 06/26/2017 - FEDERAL OFFICIAL GAZETTE 06/27/2017 – Establishes the Brazilian Forum on Climate Change.

DECREE Nº. 9.101, OF 07/20/2017 - FEDERAL OFFICIAL GAZETTE 07/21/2017 – Amends Decree Nº. 5.059, of April 30, 2004, and Decree Nº. 6.573, of September 19, 2008, which reduce the tax rates of the PIS/PASEP Contribution and the Social Security Financing Contribution - COFINS levied on import and marketing of gasoline, diesel oil, liquefied petroleum gas (LPG), aviation kerosene and alcohol.

DECREE Nº. 9.112, OF 07/28/2017 – FEDERAL OFFICIAL GAZETTE 07/28/2017 – Extra Issue – RECTIFIED FEDERAL OFFICIAL GAZETTE 07/31/2017 – Extra Issue – Drafts the participation in the Supervisory Boards referred to in art. 6 of Complementary Law Nº. 159, dated May 19, 2017, until the creation of their positions in committee and amends Decree Nº. 6.573, of September 19, 2008, which reduces the tax rates of PIS/PASEP Contribution and Social Security Financing Contribution - COFINS levied on the importation and sale of alcohol, including for fuel purposes.

DECREE Nº. 9.128, OF 08/17/2017 - FEDERAL OFFICIAL GAZETTE 08/18/2017 – Amends Decree Nº. 6.759, of February 5, 2009, which regulates the administration of customs activities, and the inspection, control and taxation of foreign trade operations.

DECREE Nº. 9.174, OF 10/18/2017 - FEDERAL OFFICIAL GAZETTE 10/19/2017 – Provides on the qualification of federal public infrastructure projects in the electric power, oil and natural gas sectors, within the scope of the Presidency of the Republic's Investment Partnerships Program.

DECREE Nº. 9.177, OF 10/23/2017 - FEDERAL OFFICIAL GAZETTE 10/24/2017 – Regulates art. 33 of Law Nº. 12.305, of August 2, 2010, which establishes the National Solid Waste Policy, and complements art. 16 and art. 17 of Decree Nº. 7.404, of December 23, 2010 and gives other provisions.

DECREE Nº. 9.187, OF 11/01/2017 - FEDERAL OFFICIAL GAZETTE 11/03/2017 – Regulates the extension of thermoelectric power generation concessions referred to in Law Nº. 12.783, of January 11, 2013, and gives other provisions.

DECREE Nº. 9.192, OF 11/06/2017 - FEDERAL OFFICIAL GAZETTE 11/07/2017 – RECTIFIED DOU 08.11.2017 – Regulates Law Nº. 12.783, of January 11, 2013, to provide on the bidding of distribution and transmission concessions associated with the transfer of control of a legal entity providing public electric power service, and gives other provisions.

DECREE Nº. 9.252, OF 12/28/2017 - FEDERAL OFFICIAL GAZETTE 12/29/2017 – Establishes the methodology for calculating the reference value referred to in art. 2, caput, subsections II and III, of Law Nº. 8.001, of March 13, 1990.

CNPE [NATIONAL ENERGY POLICY COUNCIL] RESOLUTION Nº. 1, OF 01/11/2017 – Establishes the Energy Information Management Committee, with the purpose of guaranteeing the integration, coherence, quality and timeliness of energy information and statistics, necessary for the formulation of policies and actions for sustainable development of the Country.

CNPE RESOLUTION Nº. 2, OF 02/02/2017 – Authorizes the conduction of the second round of bids for exploratory blocks of oil and natural gas under the production sharing regime in the pre-salt area and approves the technical and economic parameters of the respective contracts.

CNPE RESOLUTION Nº. 3, OF 02/02/2017 – Extends the deadline for submission of the final report of the Working Group established by CNPE Resolution Nº. 6 of August 2, 2016 to propose general guidelines for energy policy to the oil and natural gas exploration and production activities.

CNPE RESOLUTION Nº. 4, OF 02/02/2017 – Recommends ANP to analyze the extension of the Exploration Phase of the oil and natural gas exploration and production block contracts of the 11th Bidding Round.

CNPE RESOLUTION Nº 5, OF 03/16/2017 – Establishes guidelines for changing the methodology used to calculate the Reference Price of Oil by the National Oil Agency (ANP).

CNPE RESOLUTION Nº. 6, OF 04/11/2017 – Authorizes conduction of the Fourteenth Bidding Round for oil and natural gas exploration and production blocks.

CNPE RESOLUTION Nº. 7, OF 04/11/2017 – Establishes guidelines for the definition of Local Content in unitised areas and approves the Local Content requirements for Bidding Rounds of areas for exploration and production of oil and natural gas to be conducted by the National Oil, Natural Gas and Biofuel Agency - ANP.

CNPE RESOLUTION Nº. 8, OF 04/11/2017 – Recommends to the National Oil, Natural Gas and Biofuel Agency (ANP) to analyze the extension of the Exploration Phase of the oil and natural gas exploration and production block contracts of the 12th Bidding Round.

CNPE RESOLUTION Nº. 9, OF 04/11/2017 – Authorizes the conduction of the Third Bidding Round under the Production Sharing Regime in the Pre-salt Area and approves the technical and economic parameters of the areas offered.

CNPE RESOLUTION Nº. 10, OF 04/11/2017 – Establishes guidelines for the multiannual planning of bids for blocks and fields for the exploration and production of oil and natural gas, as well as for their conduction in the 2018 - 2019 biennium, in terms of Law Nº. 9.478 of August 6, 1997, and Law Nº. 12.351 of December 22, 2010.

CNPE RESOLUTION Nº. 11, OF 04/11/2017 – Drafts the guidelines for the importation of biofuels.

CNPE RESOLUTION Nº. 12, OF 05/12/2017 – Establishes the technical and economic parameters of bidding for electric power generation concessions.

CNPE RESOLUTION Nº. 13, OF 06/08/2017 – Establishes the participation of Petróleo Brasileiro S.A (Petrobras) in the blocks of the Second and Third Bidding Rounds under the production sharing regime.

CNPE RESOLUTION Nº. 14, OF 06/08/2017 – Establishes strategic guidelines for the biofuel policy to be proposed by the Executive Power, creates the Ethanol Supply Monitoring Committee and the Biodiesel Supply Monitoring Committee, and gives other provisions.

CNPE RESOLUTION Nº. 15, OF 06/08/2017 – Establishes strategic guidelines for development of the market for fuels, other petroleum derivatives and biofuels, with the purpose of supporting the proposal of measures that contribute to the guarantee of national supply, and gives other measures.

CNPE RESOLUTION Nº. 16, OF 06/08/2017 – Amends the multiannual plan of bidding rounds for blocks for exploration and production of oil and natural gas for the 2018 - 2019 biennium, approved by CNPE Resolution Nº. 10 of April 11, 2017.

CNPE RESOLUTION Nº. 17, OF 06/08/2017 – Establishes the Policy for the Exploration and Production of Oil and Natural Gas, defines its guidelines and guides the planning and execution of bids, in terms of Law Nº. 9.478 of August 6, 1997, and Law Nº. 12.351 of December 22 of 2010, and gives other provisions.

CNPE RESOLUTION Nº. 18, OF 06/08/2017 – Establishes guidelines regarding the application of penalties due to lack of fuel for electric power generation agents and fuel suppliers.

CNPE RESOLUTION Nº. 19, OF 08/22/2017 – Amends Resolution Nº. 12, of May 12, 2017, which establishes the technical and economic parameters of bidding for electric power generation concessions.

CNPE RESOLUTION Nº. 21, OF 11/09/2017 – Authorizes the conduction of the Fourth Bidding Round under the Production Sharing Regime in the Pre-salt Area and approves the technical and economic parameters of the areas offered.

CNPE RESOLUTION Nº. 22, OF 11/09/2017 – Authorizes conduction of the Fifteenth Bidding Round of blocks for oil and natural gas exploration and production.

CNPE RESOLUTION Nº. 23, OF 11/09/2017 – Establishes the mandatory addition, in volume, of ten percent biodiesel to the diesel oil sold to the final consumer.

CNPE RESOLUTION Nº. 25, OF 12/19/2017 – Establishes the participation of Petróleo Brasileiro S.A. (Petrobras) in the blocks of the Fourth Bidding Round under the production sharing regime.

ANP RESOLUTION Nº. 660, OF 01/02/2017 - FEDERAL OFFICIAL GAZETTE 01/04/2017 – Art. 1: Amends Art. 1 of ANP Resolution Nº. 30, of August 6, 2013, published in the Federal Official Gazette of August 9, 2013, which enters into effect with the following wording: "Art. 1 The Biodiesel production activity, which includes construction, expansion of capacity, modification and operation of a production plant, subject to prior and express authorization by ANP, is regulated by this Resolution and by ANP Technical Regulation Nº. 02/2013, an integral part of this Resolution."

ANP RESOLUTION Nº. 661, OF 01/04/2017 - FEDERAL OFFICIAL GAZETTE 01/05/2017 – Art. 1: Amends the Preamble to ANP Resolution Nº. 33, of October 30, 2007, which enters into effect with the following wording: "Considering the edition of CNPE Resolution Nº. 5, dated October 3, 2007, of the National Energy Policy Council, which establishes general guidelines for conducting auctions for the acquisition of biodiesel, due to the legal obligation established in Law Nº. 13.033, of September 24, 2014. Considering the specific guidelines established by the Ministry of Mining and Energy and based on the CNPE regulation, CNPE Resolution Nº. 5, of October 3, 2007, for the conduction of auctions for the acquisition of biodiesel, to be promoted by the National Oil, Natural Gas and Biofuel Agency (ANP)"

ANP RESOLUTION Nº. 662, OF 01/12/2017 - FEDERAL OFFICIAL GAZETTE 01/16/2017 – Art. 1: Amends section II of article 29 of ANP Resolution Nº. 51, of 11/30/2016, which enters into effect with the following wording: "II - up to 180 (one hundred and eighty) days to comply with art. 18, paragraph 1, item "a", and paragraph 2, items "a" and "b" of this Resolution;".

ANP RESOLUTION Nº. 663, OF 01/18/2017 - FEDERAL OFFICIAL GAZETTE 01/19/2017 – Establishes procedures and documentary requirements for the reversal of precautionary measures of interdiction and seizure applied in economic activities that are part of the national supply of fuels.

ANP RESOLUTION Nº. 664, OF 01/18/2017 - FEDERAL OFFICIAL GAZETTE 01/19/2017 – Establishes the minimum prices of oils produced in the month of December 2016.

ANP RESOLUTION Nº. 665, OF 01/18/2017 - FEDERAL OFFICIAL GAZETTE 01/19/2017 – Establishes the reference prices of natural gas produced in the month of December 2016.

ANP RESOLUTION Nº. 666, OF 02/15/2017 - FEDERAL OFFICIAL GAZETTE 02/16/2017 – Establishes the minimum prices of oils produced in the month of January 2017.

ANP RESOLUTION Nº. 667, OF 02/15/2017 - FEDERAL OFFICIAL GAZETTE 02/16/2017 – Establishes the reference prices of natural gas produced in the month of January 2017.

ANP RESOLUTION Nº. 668, OF 02/15/2017 - FEDERAL OFFICIAL GAZETTE 02/16/2017 – Revokes regulatory acts in disagreement with ANP's regulatory framework.

ANP RESOLUTION Nº. 669, OF 02/17/2017 - FEDERAL OFFICIAL GAZETTE 02/20/2017 - REP. FEDERAL OFFICIAL GAZETTE OF 03/09/2017 - RECTIFIED FEDERAL OFFICIAL GAZETTE 03/23/2017 - Establishes specifications for the basic types of oil and their marketing rules.

ANP RESOLUTION Nº. 670, OF 03/08/2017 - FEDERAL OFFICIAL GAZETTE 03/09/2017 – Amends Annex IV of ANP Resolution Nº. 27 of June 16, 2016.

ANP RESOLUTION Nº. 671, OF 03/15/2017 - FEDERAL OFFICIAL GAZETTE 03/16/2017 – Amends the wording of article 14 of ANP Resolution Nº. 10/2016.

ANP RESOLUTION Nº. 672, OF 03/15/2017 - FEDERAL OFFICIAL GAZETTE 03/16/2017 – Establishes the minimum prices of oils produced in the month of February 2017.

ANP RESOLUTION Nº. 673, OF 03/15/2017 - FEDERAL OFFICIAL GAZETTE 03/16/2017 – Establishes the reference prices of natural gas produced in the month of February 2017.

ANP RESOLUTION Nº. 674, OF 03/23/2017 - FEDERAL OFFICIAL GAZETTE 03/24/2017 – Amends ANP Technical Regulation Nº. 3/2015, approved by ANP Resolution Nº. 50/2015, to modify the deadline established in item 7.10 (a).

ANP RESOLUTION Nº. 675, OF 04/19/2017 - FEDERAL OFFICIAL GAZETTE 04/24/2017 – Establishes the minimum prices of oils produced in the month of March 2017.

ANP RESOLUTION Nº. 676, OF 04/19/2017 - FEDERAL OFFICIAL GAZETTE 04/24/2017 – Establishes the reference prices of natural gas produced in the month of March 2017.

ANP RESOLUTION Nº. 677, OF 05/17/2017 - FEDERAL OFFICIAL GAZETTE 05/18/2017 – Establishes the minimum prices of oils produced in the month of April 2017.

ANP RESOLUTION Nº. 678, OF 05/17/2017 - FEDERAL OFFICIAL GAZETTE 05/18/2017 – Establishes the reference prices of natural gas produced in the month of April 2017.

ANP RESOLUTION Nº. 679, OF 05/25/2017 - FEDERAL OFFICIAL GAZETTE 05/26/2017 – Amends articles: 44 of ANP Resolution Nº. 49 of 11/30/2016, 29 of ANP Resolution Nº. 51 of 11/30/2016 and the sole paragraph of Article 36 of ANP Resolution Nº. 51 of 11/30/2016.

ANP RESOLUTION Nº. 680, OF 06/05/2017 - FEDERAL OFFICIAL GAZETTE 06/06/2017 – Provides on the obligations regarding the quality control of imported products, to be met by the importer and by the inspection firm hired by the latter, throughout the national territory.

ANP RESOLUTION Nº. 681, OF 06/05/2017 - FEDERAL OFFICIAL GAZETTE 06/06/2017 – RECTIFIED FEDERAL OFFICIAL GAZETTE OF 11/17/2017 - Updates ANP regulations in alignment with the new rule of quality control of imported products.

ANP RESOLUTION Nº. 682, OF 06/23/2017 - FEDERAL OFFICIAL GAZETTE 06/26/2017 – Establishes the minimum prices of oils produced in the month of May 2017.

ANP RESOLUTION Nº. 683, OF 06/23/2017 - FEDERAL OFFICIAL GAZETTE 06/26/2017 – Establishes the reference prices of natural gas produced in the month of May 2017.

ANP RESOLUTION Nº. 684, OF 06/29/2017 - FEDERAL OFFICIAL GAZETTE 06/30/2017 – Provides on the amendment of ANP Resolution Nº. 40, of October 25, 2013, which refers to the specifications of automotive gasoline and quality control obligations, to be met by the various economic agents that commercialize the product throughout the national territory.

ANP RESOLUTION Nº. 685, OF 06/29/2017 - FEDERAL OFFICIAL GAZETTE 06/30/2017 – Establishes rules for the approval of quality control and the specification of biomethane from landfills and wastewater treatment plants for vehicular use and residential, industrial and commercial facilities to be marketed throughout the national territory.

ANP RESOLUTION Nº. 686, OF 06/29/2017 - FEDERAL OFFICIAL GAZETTE 06/30/2017 – Amends ANP Resolution Nº. 26, of August 30, 2012.

ANP RESOLUTION Nº. 687, OF 06/29/2017 - FEDERAL OFFICIAL GAZETTE 06/30/2017 – Provides on the amendment of ANP Resolution Nº. 52, of December 29, 2010, which establishes the specifications of waterway fuels by the various economic agents throughout the national territory.

ANP RESOLUTION Nº. 688, OF 07/05/2017 - FEDERAL OFFICIAL GAZETTE 07/06/2017 – Establishes the cases in which economic agents may adopt remedial measures in order to adjust their conduct to the provisions of the applicable legislation and avoid the application of penalties.

ANP RESOLUTION Nº. 689, OF 07/05/2017 - FEDERAL OFFICIAL GAZETTE 07/06/2017 – Updates ANP Resolution Nº. 42 of August 19, 2011, in order to adapt it to the experience acquired since its publication.

ANP RESOLUTION Nº. 690, OF 07/17/2017 - FEDERAL OFFICIAL GAZETTE 07/18/2017 – Establishes the minimum prices of oils produced in the month of June 2017.

ANP RESOLUTION Nº. 691, OF 07/17/2017 - FEDERAL OFFICIAL GAZETTE 07/18/2017 – Establishes the reference prices of natural gas produced in the month of June 2017.

ANP RESOLUTION Nº. 692, OF 07/17/2017 - FEDERAL OFFICIAL GAZETTE 07/18/2017 – RECTIFIED FEDERAL OFFICIAL GAZETTE 08/02/2017 - Regulates the extraordinary installment referred to in Provisional Measure Nº. 780 of May 19, 2017.

ANP RESOLUTION Nº. 693, OF 08/15/2017 - FEDERAL OFFICIAL GAZETTE 08/16/2017 – Establishes the minimum prices of oils produced in the month of July 2017.

ANP RESOLUTION Nº. 694, OF 08/15/2017 - FEDERAL OFFICIAL GAZETTE 08/16/2017 – Establishes the reference prices of natural gas produced in the month of July 2017.

ANP RESOLUTION Nº. 695, OF 08/28/2017 - FEDERAL OFFICIAL GAZETTE 08/29/2017 – Amends the wording of article 44, II, "a" and "b", III and V of ANP Resolution Nº. 49/2016 and of articles 29, I, II, III and 36, sole paragraph of ANP Resolution Nº. 51/2016.

ANP RESOLUTION Nº. 696, OF 08/31/2017 - FEDERAL OFFICIAL GAZETTE 09/01/2017 – RECTIFIED FEDERAL OFFICIAL GAZETTE 10/03/2017 - Amends the current regulation to include methanol in the definition of solvent and make ANP's control of this product more effective.

ANP RESOLUTION Nº. 697, OF 08/31/2017 - FEDERAL OFFICIAL GAZETTE 09/01/2017 – Establishes the registration of methanol handling and storage terminals and pipelines.

ANP RESOLUTION Nº. 698, OF 09/6/2017 - FEDERAL OFFICIAL GAZETTE 09/8/2017 – Amends ANP Resolution No. 25, of July 8, 2013.

ANP RESOLUTION Nº. 699, OF 09/06/2017 - FEDERAL OFFICIAL GAZETTE 09/08/2017 – Establishes procedures for coding wells, defining the Well Result, Well Status, and sending various reports to monitor ANP's activities in wells.

ANP RESOLUTION Nº. 700, OF 09/13/2017 - FEDERAL OFFICIAL GAZETTE 09/14/2017 – Amends the deadline of the transitional provision of ANP Resolution Nº. 10, of March 14, 2016.

ANP RESOLUTION Nº. 701, OF 09/14/2017 - FEDERAL OFFICIAL GAZETTE 09/15/2017 – RECTIFIED FEDERAL OFFICIAL GAZETTE 09/27/2017 - Establishes the minimum prices of oils produced in the month of August 2017.

ANP RESOLUTION Nº. 702, OF 09/14/2017 - FEDERAL OFFICIAL GAZETTE 09/15/2017 – RECTIFIED FEDERAL OFFICIAL GAZETTE 09/27/2017 - Establishes the reference prices of natural gas produced in the month of August 2017.

ANP RESOLUTION Nº. 703, OF 09/26/2017 - FEDERAL OFFICIAL GAZETTE 09/27/2017 – RECTIFIED FEDERAL OFFICIAL GAZETTE 10/04/2017 AND FEDERAL OFFICIAL GAZETTE 11/23/2017 - Establishes the criteria for fixing the reference price of oil produced monthly in each field.

ANP RESOLUTION Nº. 704, OF 09/29/2017 - FEDERAL OFFICIAL GAZETTE 10/02/2017 – Revokes ANP Resolution Nº. 1 of January 6, 2014, which drafts additives for automotive fuels, and gives other provisions.

ANP RESOLUTION Nº. 705, OF 10/11/2017 - FEDERAL OFFICIAL GAZETTE 10/13/2017 – Establishes the minimum prices of oils produced in the month of September 2017.

ANP RESOLUTION Nº. 706, OF 10/11/2017 - FEDERAL OFFICIAL GAZETTE 10/13/2017 – Establishes the reference prices of natural gas produced in the month of September 2017.

ANP RESOLUTION Nº. 707, OF 10/18/2017 - FEDERAL OFFICIAL GAZETTE 10/19/2017 – Provides for the amendment of ANP Resolution Nº. 3 of January 19, 2011, which establishes the Compulsory Marking Program for Products and determines the identification through the marking of liquid hydrocarbons not intended for the formulation of gasoline or diesel oil.

ANP RESOLUTION Nº. 708, OF 10/25/2017 - FEDERAL OFFICIAL GAZETTE 10/26/2017 – REP. FEDERAL OFFICIAL GAZETTE 11/16/2017 - Decides to provide, on the basis of Resolutions: CNPE Nº. 4/2017, published in the Federal Official Gazette on 02/10/2017 and CNPE Nº. 8/2017, published in the Federal Official Gazette on 04/27/2017, the signature of additives to the concession contracts of the Eleventh and Twelfth Bidding Rounds for the Exploration Phase for a term of two (2) years, with conditions.

ANP RESOLUTION Nº. 709, OF 11/14/2017 - FEDERAL OFFICIAL GAZETTE 11/16/2017 – Amends ANP Resolutions Nºs. 49 and 51, both of November 30, 2016.

ANP RESOLUTION Nº. 710, OF 11/14/2017 - FEDERAL OFFICIAL GAZETTE 11/16/2017 – Establishes the minimum prices of oils produced in the month of October 2017.

ANP RESOLUTION Nº. 711, OF 11/14/2017 - FEDERAL OFFICIAL GAZETTE 11/16/2017 – Establishes the reference prices of natural gas produced in the month of October 2017.

ANP RESOLUTION Nº. 712, OF 11/24/2017 - FEDERAL OFFICIAL GAZETTE 11/27/2017 – Extends the deadline referred to in article 21 of ANP Resolution Nº. 696, of August 31, 2017.

ANP RESOLUTION Nº. 713, OF 12/13/2017 - FEDERAL OFFICIAL GAZETTE 12/14/2017 – Amends ANP Resolution Nº. 22, of Friday, April 11, 2014.

ANP RESOLUTION Nº. 714, OF 12/18/2017 - FEDERAL OFFICIAL GAZETTE 12/19/2017 – Establishes the minimum prices of oils produced in the month of November 2017.

ANP RESOLUTION Nº. 715, OF 12/18/2017 - FEDERAL OFFICIAL GAZETTE 12/19/2017 – Establishes the reference prices of natural gas produced in the month of November 2017.

APPENDIX

CHARTS AND FIGURES

APPENDIX

TABLES

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