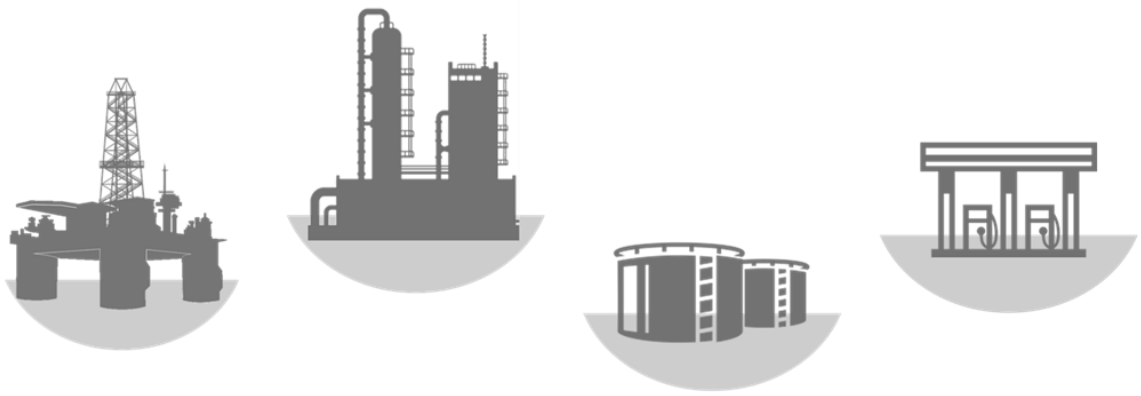
EMPRESA DE PESQUISA ENERGÉTICA

SPECIAL REPORT

RECENT DEVELOPMENTS IN THE BRAZILIAN OIL INDUSTRY



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Recent Developments in the Brazilian Oil Industry
Special Report

Summary

Introduction

The collapse in oil prices in late 2014 and ensuing slow recovery until mid-2017 caused turmoil in the oil sector. Companies and governments had gotten used to prices that had held between US$100 and US$120 per barrel for several years. They had to change and curtail their spending in order to operate under the new conditions. Service contracts were renegotiated and core assets prioritized, reducing costs and preserving short-term supply. At the same time, a severe macroeconomic crisis and instability hit the country particularly hard. The downward movement in oil prices combined with this crisis pushed down activity in the Brazilian oil sector.

The crash in oil prices also put Petrobras, the state-controlled oil company, in a complex situation, which was already delicate after a corruption probe publicized some of its findings. The company had to delay filing its 2014 annual report after its auditor refused to sign off on its results. It had borrowed considerable amounts to invest in exploration & production (E&P), in order to enable the company to increase production from its pre-salt find. These investments contributed to Petrobras becoming the most indebted oil company globally.

The huge debt-load concurred with significant write-downs, a decreasing production from its mature fields due to lack of investments, record-low oil prices and the loss of Brazil´s sovereign investment grade. Up to this point, Petrobras had mostly acted as guarantor of the national fuel supply. Its fuel price policies were not necessarily keeping up with international prices, and it sold imported fuel below the import-price parity for several years. This further eroded the company´s cash flow. By 2016, its liquidity risk forced the company to restructure, further disrupting the sector.

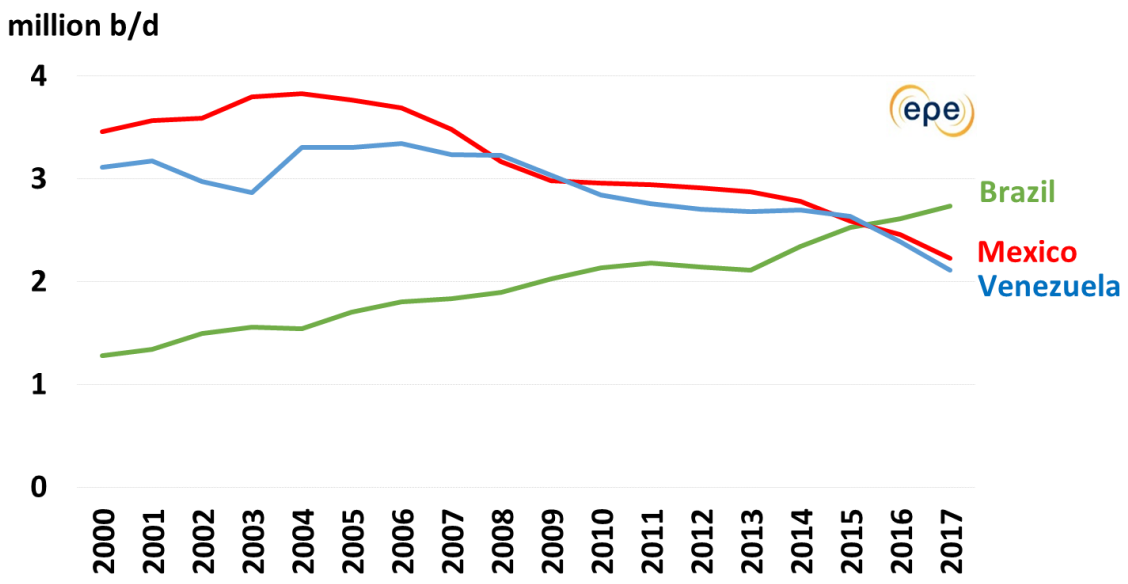
In spite of that, the company managed to start a new phase, with profitability becoming the main driver for decisions in Petrobras. Investments were substantially reduced, especially on downstream, in which the company had hitherto invested considerable amounts. Projects in the prolific pre-salt, even though delayed, were largely maintained due to its importance in this new phase. This was warranted by curbs to development and production costs due to new technologies, good geology and service contract renegotiations. Actions to reduce corporate debt and leverage were prioritized, including a divestment plan. The company put up for sale several of its downstream subsidiaries, mature fields and petrochemical plants, among others, creating opportunities for new players in the Brazilian oil sector.

The sector´s crisis also stimulated the implementation of nationwide institutional changes. The Executive and Legislative revised the regulatory framework through a series of coordinated new laws, executive orders and programs. The main goal was to attract new investments.

Given Brazil's regulatory changes and its resource availability, global majors increased investments in the country's upstream. It is noteworthy that this increase happened in spite of them having reduced exploratory activity and halted most capital-intensive projects globally. Further, some international companies also started showing interest and investing in the Brazilian downstream. The below sections of this report will focus on explaining how key events drove the national oil sector, both upstream and downstream. This report will also detail some of the initiatives undertaken by the Brazilian government, and how the industry managed to start overcoming the oil crisis.

Upstream

Before oil prices dropped in 2014, Brazil´s domestic production had been growing, more than offsetting declines in its mature fields. This resulted in the country becoming Latin America´s top oil producer, surpassing Mexico and Venezuela in 2016, as shown on Graph 1.



Graph 1: Latin America´s Top Oil Producers

Source: BP (2018).

The domestic production growth, especially since the 2013 inflection point, was mainly by virtue of pre-salt Santos Basin´s high productivity, which relied on oil outputs per well above the global oil industry´s average[1]. This high reservoir productivity has required fewer wells per production system, reducing budgeted costs.

Pre-salt continues to attract most investments, and its production already accounts for more than 50% of the national production (ANP, 2018a). The rapid rise in production was enabled by the aforementioned productivity, but was also supported by high drilling success rates[2]. Likewise, continued investments in new technologies improved well construction efficiencies, which reduced drilling and completion times. The combination of these factors allowed a 40% fall in well breakeven costs from 2010 to 2017 (PETROBRAS, 2018a). These factors enabled investment increases in a low price and low investment scenario globally.

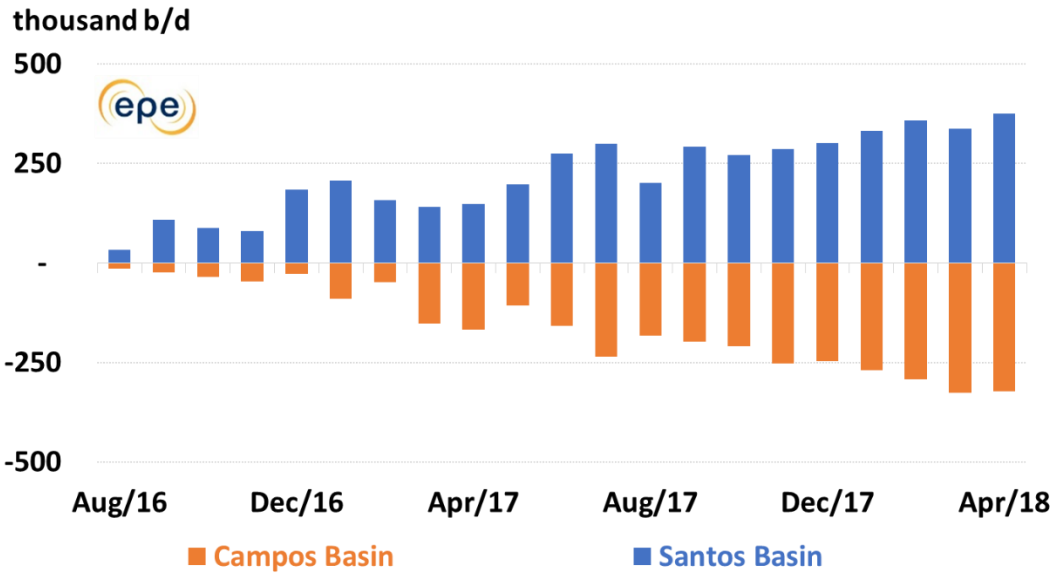
On the other hand, post-salt fields in the Campos Basin have seen declining outputs, as demonstrated on Graph *2*. Focused on capital-intensive pre-salt upstream projects, Petrobras reduced investments in its mature fields, which directly impacts those recovery rates[3]. In order to stimulate new investments, the government has eased mandatory local content regulations, adjusted taxes and royalties, extended the expiration dates of current concession contracts: in short, reduced the regulatory cost for investing in mature fields. Petrobras is also actively trying to divest mature fields[4].

[1] According do Petrobras, average productivity for pre-salt wells in the Santos basin has been 27 thousand b/d. Average productivity per well lies at 15 thousand b/d in the North Sea, and 10 thousand b/d in the Gulf of Mexico. (PETROBRAS, 2014a, 2018a, 2018b)

[2] Pre-salt´s annual drilling success rates in exploration between 2012 and 2015 were all above 80% (IBP, 2017), showing high values when compared to the world average for wildcat drilling (38% success for wells drilled between 2007 and 2012 - NELON *et al*, 2013).

[3] The average recovery rate for the Campos Basin is 24%, and Brazil´s best rate is in the Recôncavo basin, with 33%. Meanwhile, the recovery rate stands at 35% globally, and comes close to 50% in Norway. (ANP, 2018c)

[4] The divestment plan includes oil fields like Roncador (which had 25% of rights sold to Equinor), Azulão (sold to Eneva), Lapa and Iara (rights transferred to Total as part of a strategic cooperation agreement) and some onshore fields that comprise project Topázio, among others.



Graph 2: Oil Production Change from July 2016

Source: ANP (2018b).

Several initiatives were developed seeking to build investor confidence and increase predictability. Among those was the promulgation of Law nº 13,586/2017, regulated by the Normative Instruction RFB nº 1,781/2017, that extended Repetro Sped[5], a special customs program exempting the export and import of goods for the industry of certain taxes until 2040. The exemption was previously set to expire in 2019, provoking uncertainty over future returns on capital. The government also established a special tax regime allowing certain investments to be tax deductible. This was authorized in order to stimulate further investments on new and existing fields. Extensions for the concessions of older fields were also granted in order to improve recovery rates and to stimulate further investments (ANP, 2016). An even more favorable tax regime and incentives are

[5] The President sanctioned Repetro Sped in December 2017. The program includes the reduction of taxes collected by individual states. Important oil and gas producing states such as São Paulo and Espírito Santo have already approved and adhered to Repetro Sped. Rio de Janeiro is the only major producing state that has not adhered to the new program yet. However, the delay in voting to approve the special program by the state assembly has not slowed down other reforms or the bidding rounds for oil fields.

under consideration by a government program led by the Ministry of Mines and Energy (MME[6]) to stimulate onshore oil and gas exploration and production (Reate[7]).

The National Council on Energy Policy (CNPE[8]) removed local content as an auction parameter, and specified predefined and lower percentages for future contracts. The percentages came down from an average 79.5% in the 13th bidding round to values between 18% and 40% for prospective rounds[9].The Brazilian Petroleum Agency (ANP[10]) also regulated the waiver for concession contracts up to the 13th bidding rounds, adapting the previously used percentages according to the new levels set by the CNPE.

Another objective, besides clarity and the reduction of the regulatory cost to operate in Brazil, was to promote predictability. This was achieved with the approval by the CNPE of a schedule of bidding rounds up to 2021, as shown in the Table 1.

Table 1: Brazil Oil and Gas Bidding Rounds Calendar

YEAR	ROUND	REGIME	DATE	DESCRIPTION
2018	4th	Production Sharing	May/18	Pre-salt blocks in the Campos and Santos Basins
	15th	Concession	May/18	Ultra-deepwater and onshore blocks
	5th	Production Sharing	Sep/18	Pre-salt blocks in the Campos and Santos Basins
2019	6th	Production Sharing	Q3 2019	Pre-salt blocks Aram, Sudeste de Lula, Sul and Sudoeste de Jupiter
	16th	Concession	Q3 2019	Ultra-deepwater and onshore blocks
2020	17th	Concession	2020	Deepwater blocks
2021	18th	Concession	2021	Offshore blocks

Source: CNPE (2017b, 2018).

[6] MME: Ministério de Minas e Energia.
[7] Reate: Programa de Revitalização das Atividades de Exploração e Produção de Petróleo e Gás Natural em Áreas Terrestres. It proposes the development of an integrated plan prioritizing specific government policies, regulation and transport infrastructure for onshore fields.
[8] CNPE: Conselho Nacional de Política Energética. Chaired by the Minister for Mines and Energy, the CNPE is an inter-ministerial advisory board to the Brazilian President, responsible for the formulation of energy policies and guidelines.
[9] For the 3rd Production Sharing Round, minimum local content requirements were: i) 18% (global) for the exploratory phase; ii) for the production development phase: 25% for well construction, 40% for offloading systems and 25% for offshore production rigs. (CNPE, 2017a)
[10] ANP: Agência Nacional do Petróleo, Gás Natural e Biocombustíveis. The ANP is the Brazilian oil regulator.

When the pre-salt fields were still in their early stages in 2010, but considerable volumes had already been discovered, the government transferred 5 billion barrels under a rights agreement (Cessão Onerosa) to Petrobras. However, ANP now estimates recoverable resources of at least 11 billion barrels in the ceded areas (ANP, 2018d). In addition to the Búzios field, which already started producing in 2018, Petrobras declared other nine fields ceded under this contract to be commercially viable (PETROBRAS, 2017a). Some of those fields should also be auctioned off, as soon as Petrobras and the Federal Government agree on the terms of the new tender, which could add another 6 billion barrels to the aforementioned bidding calendar in 2019/2020.

Further, CNPE also authorized ANP to keep fields and blocks not awarded in previous bidding rounds on permanent offer. They represent a total of 846 areas or blocks, in thirteen different basins, with a total area of 285,400 km². In July 2018, ANP published the contract notice and model for concession licenses from the permanent offer. In September 2018, CNPE authorized un-awarded pre-salt areas in production sharing bidding rounds to also be permanently put up for sale (MME, 2018).

Another regulatory landmark occurred in November 2016, with the promulgation of the "new pre-salt law" – Law nº 13,365/2016. It altered Law nº 12,351/2010 to entitle Petrobras the option to choose to participate as an operator, with a minimal 30% stake, in consortia formed to explore oil blocks licensed under the production sharing contracts (PSC). Petrobras is no longer obligated to be the sole operator of PSC projects. The state-controlled company now has the option to request a 30% stake in the winning bid, in case it does not win the bid[11].

The bidding rounds following the approval of the new laws were seen as successful, given the interest of international oil companies, record signing bonuses and the volume of investments attached to these contracts. In 2018, the 15th Concession Bidding Round auctioned 22 out of 70 offered areas, with over US$ 2.4 billion received in signing bonuses. In the 4th PSC Round, three out of the four fields had offers, collecting

[11] Petrobras can exercise priority on previously chosen blocks in the bidding round, joining the winning consortium as operator owning a share of 30%, paying the signing bonus proportionately. Since the law was promulgated, Petrobras has manifested interest in six blocks that were offered, being part of the consortium with the best bid in four blocks (Entorno de Sapinhoá, Peroba, Alto de Cabo Frio Central and Dois Irmãos) and adhering to the best proposal in the other two (Uirapuru and Três Marias). Petrobras has manifested interest in Sudoeste de Tartaruga Verde, which was in the 5th PSC.

US$ 0.8 billion in signing bonuses and over US$ 180 million in investment commitments. Global companies like ExxonMobil, Chevron, BP, Qatar Petroleum and CNODC all acquired stakes in these rounds (ANP, 2018e).

In the 5th PSC Round, all the four fields (Saturno, Titã, Pau-Brasil and Sudoeste de Tartaruga Verde in the Campos and Santos Basins) had offers, collecting US$ 1.7 billion in signing bonuses and US$ 250 million in investment commitments. Shell, ExxonMobil, BP and Petrobras are the operators, but Chevron, Qatar Petroleum, Ecopetrol and CNOOC are also part of this investment in Brazil.

Another relevant source of financing for the Brazilian Government is the sale of the Union's oil. Pré-Sal Petróleo S.A. (PPSA)[12] began to sell the country's part of oil production from fields under PSC or Unitization Agreements involving federal areas. Two cargoes have already been sold to Petrobras in May 2018. It also succeeded in auctioning off three years worth of its future share of production from Mero and Sapinhoá fields to Petrobras and one years worth from Lula field to Total[13] (PPSA, 2018). The establishment of a national oil-trading arm has been authorized by Law nº13,679/2018, and is under consideration by PPSA, given the significant amounts of oil the Union will have to market.

[12] PPSA: Empresa Brasileira de Administração de Petróleo e Gás Natural S.A. - Pré-Sal Petróleo S.A. State-owned company whose objective it is to manage the production-sharing contracts and to market the government's share of hydrocarbons. (BRASIL, 2010)

[13] Petrobras acquired the Union´s share of oil production from Mero field for the next 36 months, forecast at 10.6 million barrels. It also acquired the Union´s share of oil production from Sapinhoá field for the next 36 months, forecast at 600 thousand barrels. Total E&P acquired the Union´s share of oil production from Lula field for the next 12 months, forecast at 1.1 million barrels.

Downstream

Petrobras's monopoly over the downstream sector was effectively broken up with the institutional rearrangement brought about by a constitutional amendment[14] EC nº 9/1995[15] in favor of a more competitive and open regime. Refining, import and export activities remained almost a monopoly, due mainly to Petrobras's hold on the Brazilian fuel logistics infrastructure and its strategy for the national fuel supply[16]. Competition has been more effectively introduced on the wholesale of oil products, with challengers contesting BR Distribuidora's (Petrobras subsidiary) market share. ANP´s regulations stimulate the wholesale competition, not allowing the combined ownership of wholesale and retail assets by the same company (ANP, 2014). Such regulation does not exist for refineries and importers.

The recent crisis drove Petrobras to change its strategy for the national fuel supply. One of the new pillars of the company´s leverage reduction program is guaranteeing higher profitability downstream[17]. Accordingly, in October 2016, Petrobras announced a revision in its pricing policy, adopting a monthly frequency for its price updates, effectively trying to match international and national prices. In June 2017, this frequency changed to daily, for the first time subjecting Brazilian consumers to international price fluctuations[18]. The company also declared its intention to sell for at least the international price parity.

[14] EC: Emenda Constitucional.

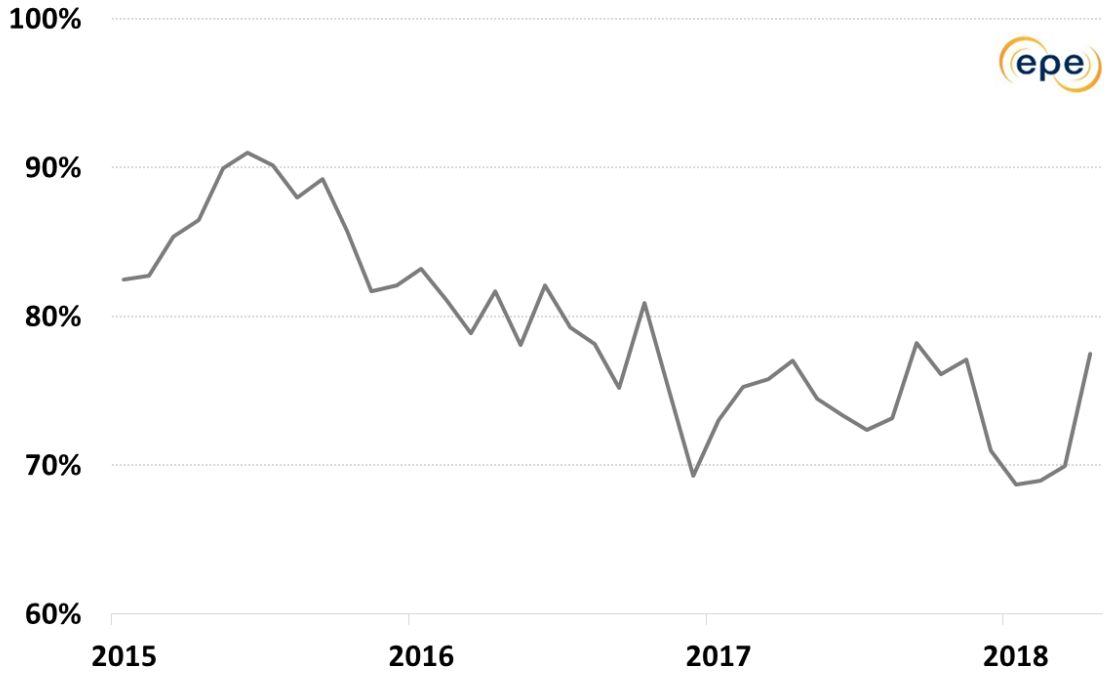
[15] Henceforth, the Federal Law nº 9,478/1997 disciplined the sector. Highlights from this new legislation include an easing of the state monopoly, the creation of a federal regulator (ANP) and the opening up of the sector.

[16] Since the market liberalization, by the end of the 1990's, Petrobras never formally stated that guaranteeing Brazil´s fuel supply was one of its objectives. However, over the years, up until 2008 at least, it repeatedly stated that it would "use its transport and logistics infrastructure to guarantee the national fuel supply and the return on capital for its investors" (PETROBRAS, 2008). However, its strategy repositioned from being "one of five biggest integrated energy companies in the world" in 2014 (PETROBRAS, 2016) to become an "integrated energy company that evolves with society, generating value and with a unique technical capacity" (PETROBRAS, 2014b). Its current presentations show that "the present fuel pricing strategy is based on competition and a balance between imports and local production" (PETROBRAS, 2018c). Therefore, its pricing policy, investments and production before 2016 were not necessarily focused on profit maximization.

[17] In previous years, Petrobras had often sold oil products for less than the international parity price. The company attenuated international price fluctuations, keeping national prices relatively stable.

[18] Not all oil products adopted the daily price revisions. Non-industrial liquefied petroleum gas (LPG) consumers buy smaller recipients (up to 13 kg), and these were shielded from much of the price fluctuations after a seasonal surge in late 2017 that elevated prices considerably.

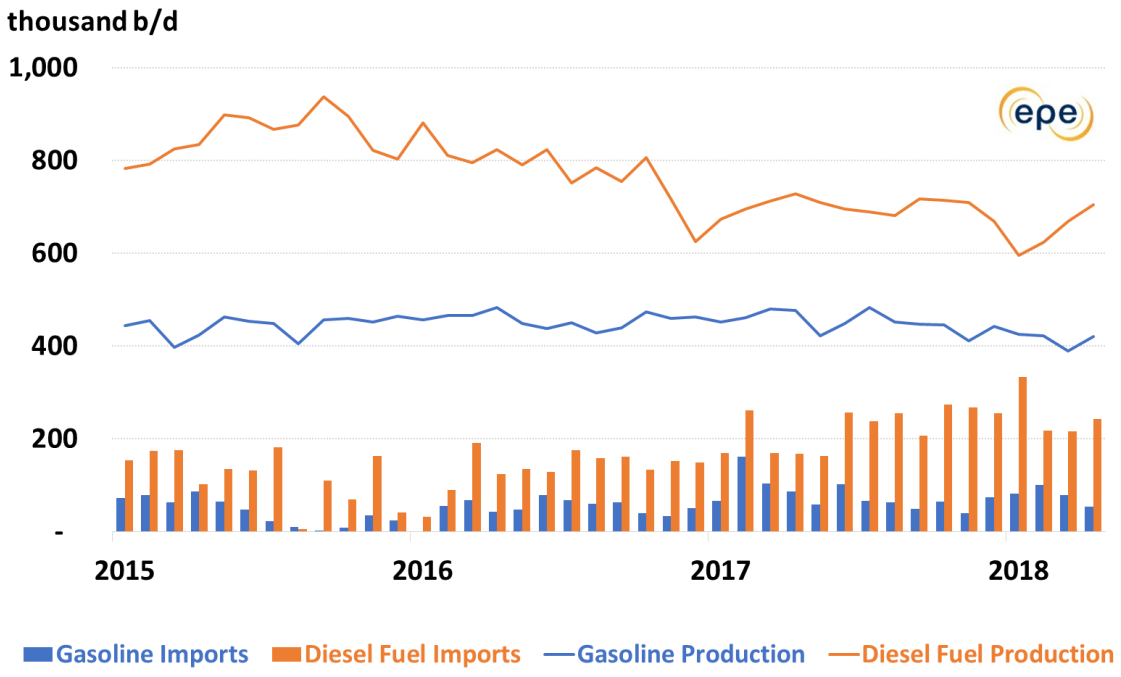
Another consequence of Petrobras's new focus on higher profitability was the collapse in refinery utilization rates. The Graph 3 shows that utilization rates had reached historical highs during the first years of the decade, when maximizing refinery throughput was prioritized to the detriment of profitability.



Graph 3: Mean Brazilian Refining Utilization Rate

Source: EPE (2018a).

Since the beginning of 2017, the average utilization rate oscillated mostly between 70% and 80%, affecting national output of oil products, in particular diesel. Consequently, the volume of fuel imports went up, despite retractions in demand due to the Brazilian economic crisis. Graph 4 illustrates the main oil product imports.



Graph 4: Diesel and Gasoline Production and Imports

Source: EPE (2018a).

Petrobras's new strategic positioning created opportunities throughout the value chain, which includes the divestment plan. The main completed divestitures are the sale of a polyester complex (Petroquímica Suape and Citepe) to Alpek, and of its share in one of the largest sugar and ethanol groups in Brazil (São Martinho). The sale of a natural gas pipeline network (TAG) and a fertilizer plant (Araucária Nitrogenados) had been announced, but has been suspended by the Brazilian Supreme Court[19].

Another significant downstream divestment by Petrobras was the Initial Public Offering (IPO) of BR Distribuidora in December 2017. This was a step further towards a more open market. The sale of Liquigás, Petrobras's subsidiary in LPG distribution, was not approved by Brazil´s Federal Trade Comission (Cade[20]). The allegation was that Liquigás' acquisition by Ultragaz would have excessively concentrated the LPG wholesale market, reducing competition and lowering consumer welfare (CADE, 2018).

[19]The Brazilian Supreme Court (STF: Supremo Tribunal Federal) granted an injunction preventing any state-owned company of selling a majority stake without legislative approval. First, STF is going to finish reviewing the constitutionality of Law nº 13,303/2016 that allows these companies to sell assets without having to perform an auction (STF, 2018).
[20] Cade: Conselho Administrativo de Defesa Econômica.

Even if refineries were running at full capacity, Brazil would still be a net importer of oil products. Until 2016, there were no established competitors set up to import fuel. This circumstance began to change when national fuel prices started to be sold above the import price parity[21]. Independent wholesalers and traders started bringing oil products to Brazil when it became clear the state-owned company would keep prices above the import parity. This strategy helped grow the number of players, as well as their activities. Petrobras's market share in diesel imports declined to a record low of 4.3% in 2017 from 16.4% in 2016 (ANP, 2018f). The loss of market share compelled the company to review its strategy and reduce oil product prices, which now allegedly hover around import parity for most fuels. Its market share in diesel imports already climbed to 9% in the first half of the year (ANP, 2018f).

Once economic growth picks up again, energy demand is projected to grow considerably given Brazil´s low energy per capita use, low GDP per capita and social disparity. An economic growth followed by some wealth distribution will increase oil demand, even in a scenario where electric cars replace much of the gasoline demand (EPE, 2018b). Previously, under a similar outlook, Petrobras would already have been investing in import infrastructure and/or new refining capacity. Except that, with all its capital tied up in pre-salt projects, it is essentially willing to invest only enough to maintain the infrastructure it already possesses[22].

Anticipating potential bottlenecks, the government opened several work fronts in order to facilitate and enable new downstream investments. The preeminent initiative in this front is Combustível Brasil (Brazil Fuel), which is a forum to establish a dialogue between the civil society and the government (ANP, 2017). The main objective is to promote a clear and investment-friendly regulatory environment for downstream expansion. Excessive regulation, unclear and heterogeneous regional taxes, lack of competition, insufficient and excessively concentrated infrastructure are some of the main issues identified so far. These have been analyzed since 2017, and strategies on how to tackle them are under consideration.

[21] Taking advantage of the decline in international prices, Petrobras managed to start selling above import parity without increases in nominal domestic prices.

[22] Petrobras's penultimate business plan, PNG 2017-2021, set apart 25% of its downstream budget for capex in refining and transport infrastructure. This value is almost entirely set apart to finish the SNO_X unit and to build the second train in RNEST refinery. About 50% of the entire budget was set apart for operational continuity (PETROBRAS, 2016). The latest business plan, PNG 2018-2022, shows the same spending targets (PETROBRAS, 2017b).

Concurrently, delegations from China, India and Iran have shown interest in investing in new refineries in the country[23]. Petrobras, which is also interested in foreign investment due to its capital constraints, announced in April 2018 a proposal for selling a majority equity interest in its refining and logistics operations in the northeastern and southern regions of Brazil[24].

Brazil's logistics are largely dependent on road freight, with trucks being responsible for over 90% of the country´s freight energy demand and over 55% of its freight activity (EPE, 2012; EPE, 2016). The economic stimulus package, introduced after the 2008 international crisis, spurred the economy, supporting an above average growth for truck sales and diesel consumption. The national crisis reduced demand for freight haulage from 2015, but the fleet had already grown considerably. This created an oversupply of trucks that depressed freight prices and eroded truckers' earnings. Once international fuel prices started to rise and the national currency (Real) to depreciate, Brazil's nominal diesel prices grew 37% from October 2014 to April 2018. The situation became untenable for these independent truckers, who organized a national strike that immobilized the country's logistics in May 2018.

[23] One example is the signature of a "business model agreement" between Petrobras and CNPC, which details how both companies plan to create a joint venture (80%/20%) to conclude and operate the Comperj refinery in Rio de Janeiro, once a previous study deems the investment viable. (PETROBRAS, 2018d) There have also been talks between the regional governments of Ceará and Maranhão and representatives of China, India and Iran, for the construction of two new refineries in the northeastern region of Brazil (ARGUS, 2018).

[24] The Northeast Region cluster is comprised of two refineries (RLAM and RNEST) and logistical assets (pipelines and terminals) integrated to these refineries. The South Region cluster is comprised of two refineries (Refap and Repar) along with pipelines and terminals associated to these refineries. Petrobras decided to sell a majority stake in these clusters so that a potential buyer could have an incentive to invest downstream. According to the company, its "hegemony brings a low predictability to this market", discouraging investments by other players (PETROBRAS, 2018c). However, this sale is one of those previously mentioned that is currently suspended by the Brazilian Supreme Court (STF, 2018).

The nationwide road blockages caused a shortage of even the most basic items across Brazil, including food, fuel at gas stations and medicines. After about ten days, the government granted subsidies on producers and importers of diesel, reducing taxes on this fuel and establishing a minimum price for road freight transportation. The subsidy for diesel fuel commercialization was established by a provisional measure[25]. Federal taxes (Cide, PIS and Cofins)[26] on diesel were reduced and the minimum freight price policy was introduced with MP nº 832/2018.

Another important policy is RenovaBio, the national biofuel policy introduced by Law nº 13,576/2018. It aims at expanding the use of biofuels by issuing de-carbonization credits (CBio) that will transfer a penalty on fossil fuel sold by wholesalers to biofuel producers. This should stimulate biofuel production and consumption, aiding Brazil to reach its emission targets, and to reduce the growth of its fossil fuel demand.

[25] Provisional measure or MP (Medida Provisória) is a legal instrument akin to an United States Executive Order. It is a prerogative of the President and has the force of law, but expires after 60 days if not authorized by Congress. The President can extend it for another 60 days in case Congress has not voted the order yet. The MP nº 838/2018 and the Decrees nº 9.392/2018 and nº 9.403/2018 instituted this subsidy.

[26] Federal taxes may be amended at the discretion of the President, without congressional approval, as long as the changes respect the boundaries established by law, which normally only stipulate an upper boundary.

Final Remarks

Upon discovery of the pre-salt in 2006, Brazil´s flagship hydrocarbon reserves, national oil companies, service industries and the state started preparing for windfall profits. Scheduled oil auctions were cancelled while the National Congress discussed a new regulatory regime, which came by the end of 2010. Auctions started again in 2013, with new petroleum sharing contracts governing the pre-salt fields, but the crisis and the new regulatory environment resulted in a muted interest from investors.

Investor perception improved towards the end of 2016, by virtue of Congress's approval to changes to the "pre-salt law". Petrobras was no longer obligated to participate in all pre-salt oil blocks as the sole operator, instead being granted the option to participate in the winning consortium as operator with a 30% stake. Furthermore, tax exemptions on the export and import of goods for the industry, set to expire in 2019, were extended until 2040. The return of regular bidding rounds and the introduction and adherence to a licensing schedule also augmented investor confidence. Additionally, many standards and norms were simplified and clarified, and project involvement requirements for domestic oil services were significantly reduced.

The downstream sector also saw government programs promoting regulatory changes and incentives. Addressing issues like competition and access to infrastructure, they intend to spur investments to address issues that limit de sectors' expansion.

All of these changes made investments in Brazil, especially upstream, more predictable and lucrative even in a low price market, paving the way for successful oil auctions and the re-entry of many international oil majors into the Brazilian oil sector.

The pace of change has slowed down in some areas, due mainly to the uncertainty of a new government being sworn in January 1st. However, this has not reduced the interest shown towards Brazil´s oil industry. The change needed to evolve at an even faster rate is already mapped out, and has many supporters among different stakeholders. The reforms already implemented are unlikely to be significantly modified, given that the new legislation was introduced by Congress. This foreseeable regulatory stability, Brazil´s history of adhering to contractual obligations, the high quality of reserves, and the potential demand growth all make Brazil´s oil sector attractive to investments.

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