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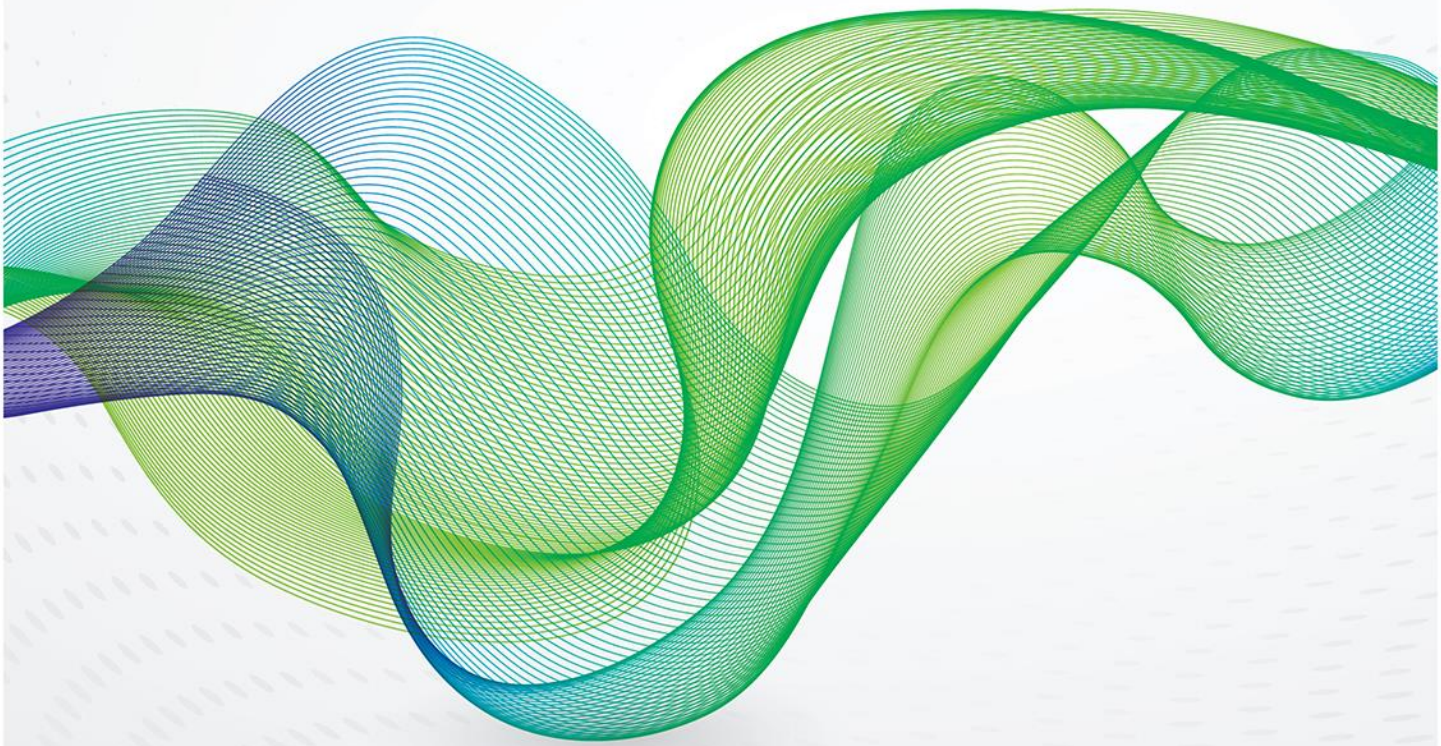
Brazil upstream bid rounds – evolve to grow

Brazil to become a top 5 oil producer by 2030?



OXFORD ENERGY COMMENT

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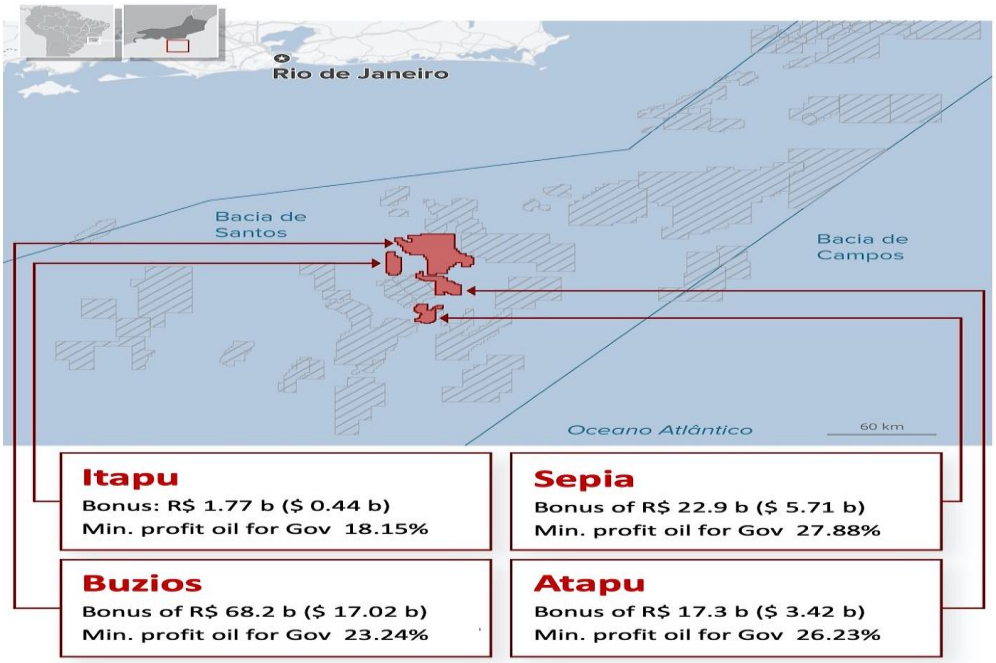
Brazil transfer of rights area auction

When Brazil's Senate passed a bill in mid-October 2019 defining the distribution of proceeds from the enormous offshore region known as the 'Transfer of Rights' area (TOR) [Figure 1] in the prolific Brazilian pre-salt exploration and production region, it was a key milestone that set in motion the largest oil bidding round in history, according to the Brazilian authorities.[1] Wood Mackenzie indicated that Brazil's TOR auction was the largest offering of discovered oil reserves since Iraq opened up its oil fields in 2009; however, access is not inexpensive. The four fields may cost more than $50 billion – $25 billion in licensing fees and profit oil share to be given to Pre-Sal Petroleo SA (the special purpose Brazilian state company responsible for managing the government pre-salt oil share) and payments to Petrobras which could represent another $25 billion or more (according to government officials) for investments already made.[2]

Figure 1: Transfer of Rights Auction Area



Source: ANP

Note: Brazilian Government estimates signing bonuses of R$ 106,5 billion ($26.6 billion) for 4 pre-salt areas in the Santos Basin

On 6 November, if all blocks had been sold, the auction winners would have been obliged to pay to the Brazilian Government a combined signing bonus of nearly R$106.5 billion ($26.6 billion[3]). This sum is to be shared: R$34.6 billion ($8.64 billion) to Petrobras, R$10.8 billion ($2.70 billion) to States, R$10.8 billion ($2.70 billion) to Municipalities, R$2.16 billion ($0.54 billion) to Rio de Janeiro (where the reserves are located), and R$48.14 billion ($12.02 billion) to the Federal Government.[4]

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[1] Gram Slattery, 'How Brazil's $26 bln oil rights auction works', Reuters, 16 October 2019.
[2] Peter Millard, 'Giant Brazil offshore oil find might be expensive for Exxon', *World Oil*, 1 November 2019
[3] Gram Slattery, 'Terms of massive Brazil oil auction "rather difficult" – Petrogal CEO', Reuters, 29 October 2019.
[4] Darlan Alvarenga, Karina Trevizan, e Luisa Melo, 'Cessão onerosa: o que é e o que está em jogo no megaleilão do pré-sal', G1, 4 November 2019.

According to Brazil's National Agency of Petroleum, Natural Gas and Biofuels (ANP), the TOR area with the four fields (Atapu, Buzios, Itapu, and Sepia) covers an area of 1,385 square kilometres (km^2) some 175 to 375 km south of Rio de Janeiro in the Santos basin; it is estimated to hold 6 to 15 billion barrels of oil (almost twice as much as Norway's or Mexico's oil reserves) in addition to the 5 billion barrels already granted to Petrobras in an agreement made between the Brazilian Government and Petrobras in 2010. At that time, Petrobras raised $70 billion in the world's largest-ever share offering, and paid the Brazilian Government R$74.8 billion ($42.5 billion) for the rights to extract 5 billion barrels.[5,6]

Following the 2010 agreement, Petrobras began declaring parts of the TOR area commercially viable in 2013 and started a renegotiation process with the Brazilian Government which lasted six years. The complex agreement contained provisions to revise some terms when fields were declared commercially viable – considering changes in oil prices, production costs, and other elements. In April 2019, after President Jair Bolsonaro had taken office in January, an economic and energy team and a new chief executive officer for Petrobras were appointed, and agreement was reached to pay Petrobras a $9 billion TOR payment to settle the dispute, enabling the TOR bidding round to be scheduled for October. This was later postponed to 6 November.[7]

The TOR area is unique, as Petrobras has performed significant exploration work which reduces the exploration risk in the area. Petrobras has exercised its preferential rights to be the operator in Buzios and Itapu, and will have at least a 30 per cent participation in those zones. Petrobras has signalled that it will compete to win, and has stated its intention to use the $9 billion TOR payment agreed with the Brazilian Government. To date, in the TOR area, Petrobras is only producing oil from Buzios and has extracted 120.9 million barrels, or 2.42 per cent of the 5 billion barrels to which it is entitled.

The Buzios field (formerly Franco) was discovered in 2010; it covers an area of 416 km^2 situated 200 km off the coast of Rio de Janeiro at water depths ranging from 1,600 meters to 2,100 meters, and is estimated to hold 4.5 billion barrels of oil reserves. ANP stated that the field is not linked with the adjacent 3–4 billion-barrel Iara field controlled by Petrobras, Shell, and Galp, and does not have discovered gas, making it easier and more profitable to develop. The first production from Buzios was achieved in April 2018, and Petrobras aims to produce 3.058 billion barrels of oil equivalent from the field.[8]

The Brazilian pre-salt area has reservoirs very deep below a salt layer and has been proven to hold enormous volumes of light oil – estimated between 50 to 100 billion barrels of recoverable crude.[9] Buzios is considered the crown jewel of the TOR, and commands a 64 per cent share of the total auction signing bonus.

Fourteen companies were approved for participation in the TOR auction: BP plc, Chevron Corp., China National Oil and Gas Exploration and Development Corp. (CNODC), China National Offshore Oil Corp. (CNOOC), Ecopetrol SA, Equinor ASA, Exxon Mobil Corp., Galp Energia SGPS SA, Petrobras, Petronas, Qatar Petroleum, Royal Dutch Shell plc, Total SA and Wintershall Dea GmbH. Total, Galp, and BP announced that they believed the assets were becoming expensive and would not, therefore, participate in the auction. Ecopetrol, Qatar Petroleum, and Wintershall were approved to participate as non-operating members of a consortium. Shell, CNOOC, and CNODC have production assets relatively close to the TOR area and may be able to develop operating synergies with lower costs.

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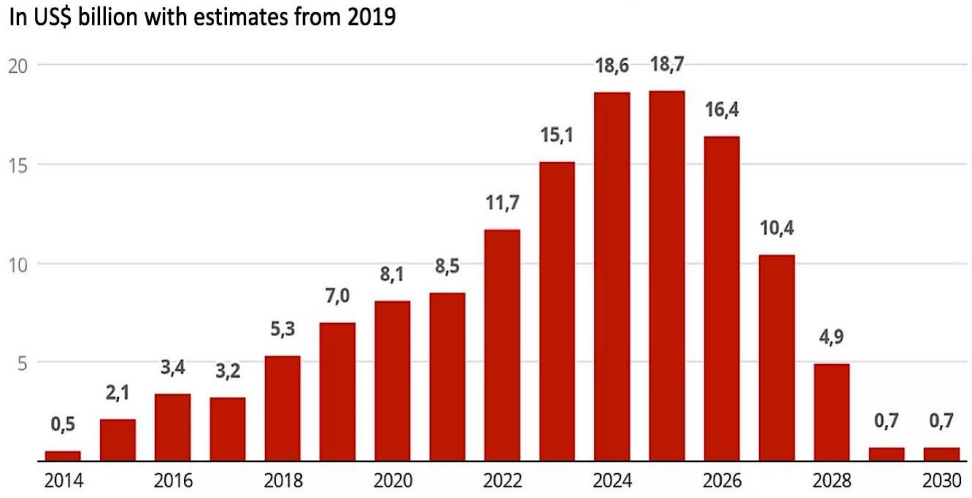
[5] Darlan Alvarenga, Karina Trevizan, e Luisa Melo, 'Cessão onerosa: o que é e o que está em jogo no megaleilão do pré-sal', G1, 4 November 2019.
[6] Peter Millard, 'Giant Brazil offshore oil find might be expensive for Exxon', *World Oil*, 1 November 2019.
[7] Gram Slattery, 'How Brazil's $26 bln oil rights auction works', Reuters, 16 October 2019.
[8] Buzios Field, Santos Basin, Offshore Technology, https://www.offshore-technology.com/projects/buzios-formerly-franco-field-cesso-onerosa-region-santos-basin/.
[9] Denise Luna and Brian Ellsworth, 'Brazil sees second major offshore oil discovery', Reuters, 14 May 2010.

Companies or consortia with winning bids in the TOR auction will need to find agreement with Petrobras regarding compensation for its previous expenditure on exploratory work and infrastructure in the TOR area, and also conclude a 'co-participation' agreement for the operation phase of the winning bids. The deadline for winning parties to finalize agreement with Petrobras is 2021.

Investments and oil production

The director general of ANP estimates that R$1.5 trillion ($375 billion) will need to be invested over the next ten years. The Brazilian Petroleum, Gas and Biofuels Institute (IBP), the industry association representing oil and natural gas producers, estimates $135 billion will be invested in exploration, drilling, and production up to 2030, with a peak of nearly $19 billion in 2024–25 [Figure 2[10]].

Figure 2: Investments in the Transfer of Rights Area



Source: IBP

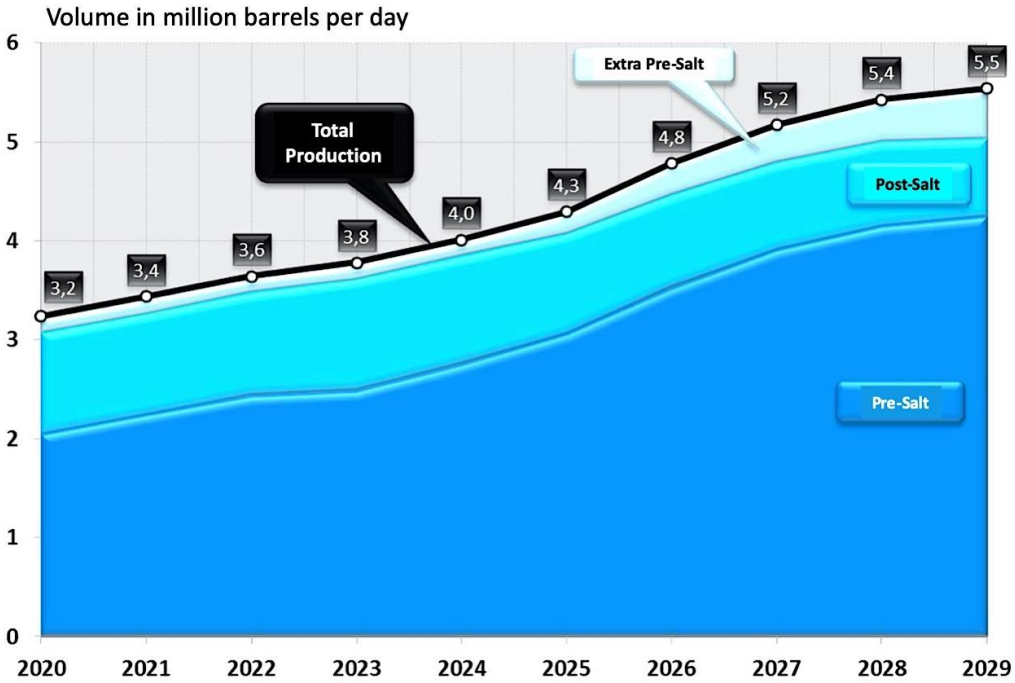
As the TOR area involves proven reserves, the start of additional production is expected to occur in four or five years, as opposed to the five to seven years in areas where reserves are yet to be discovered. Following the TOR auction, the ANP estimates that Brazilian production will grow by 1.2 million barrels per day (mbpd). According to Wood Mackenzie, the four areas in Brazil's TOR auction could be producing an extra 1.4 mbpd by 2030.[11] The ANP also estimates that the number of producing platforms would increase from 105 to 170 and the IBP estimates 388,000 new jobs would be created by 2025. According to ANP, Brazil could increase oil exports from 1.2 mbpd (currently) to a level of 4–5 mbpd by 2030, while royalties and taxes paid to Government are estimated to increase from approximately R$60 billion ($15 billion) currently, to R$70 billion ($17.5 billion) from 2024, and reach R$300 billion ($75 billion) by 2030.[12]

In its latest ten-year plan, Empresa de Pesquisa Energetica (EPE), the energy research arm of the Ministry of Mines and Energy of Brazil, forecasts that Brazilian oil production will reach 4 mbpd by 2024; the pre-salt fields of Buzios, Lula, Mero, Sepia, and Atapu (representing 69 per cent of production during the plan period) will be largely responsible for sustaining this level of production up to the end of the plan period in 2029. In the Petrobras business plan 2019–23, three additional production modules are planned for Buzios by 2021 and an additional four production modules are planned for the fields of Atapu (1), Mero (2), and Sepia (1). EPE forecasts Brazilian oil production will

[10] Darlan Alvarenga, Karina Trevizan e Luisa Melo, 'Cessão onerosa: o que é e o que está em jogo no megaleilão do pré-sal', G1, 4 November 2019.
[11] Peter Millard, 'Giant Brazil offshore oil find might be expensive for Exxon', *World Oil*, 1 November 2019.
[12] Darlan Alvarenga, Karina Trevizan e Luisa Melo, 'Cessão onerosa: o que é e o que está em jogo no megaleilão do pré-sal', G1, 4 November 2019.

reach 5.5 mbpd in 2029, largely due to discovered pre-salt reserves that are under evaluation and development in the Santos and Campos basins and in the ultra-deep water in the basins of Sergipe–Alagoas in the Brazilian Northeast region. The expected figure of 5.5 mbpd [Figure 3] for total Brazilian oil production in 2029 is 111 per cent larger than the figure for 2018, when it reached 2.6 mbpd, making the country the world's fourth or fifth largest producer (depending on the evolution of Canadian and Iranian oil production), after the USA, Saudi Arabia, and Russia. Brazil is currently the ninth-largest oil producer improving from eighth position in 2018.

Figure 3: Brazil Oil Production Forecast



Source: Ten Year Plan (EPE)

The largest contributions to oil production over the ten-year plan period come from producing assets in ultra-deep water (representing 82 per cent of national production) and deep water (11 per cent). Onshore production represents only 3 per cent, but the onshore revitalization programme REATE 2020, is expected to yield significant improvements by 2030. Currently, the pre-salt represents 59 per cent of national production and is expected to grow to 77 per cent up to the end of 2029, largely due to growth in Mero field and TOR assets in the Santos basin. Post-salt is expected to contribute 14 per cent of national production, primarily from the Campos basin, and the balance of 9 per cent is expected to come from the extra pre-salt.[13]

Auction results

The TOR auction had Petrobras as the clear winner, securing the crown jewel Buzios field in a consortium (Petrobras: 90 per cent shareholding; CNODC, and CNOOC: 5 per cent each), offering the minimum profit oil bid of 23.24 per cent. Petrobras also secured 100 per cent of the Itapu field with the minimum profit oil bid of 18.15 per cent.

[13] Ministry of Mines and Energy, 'PDE 2029: Investimentos em infraestrutura energética devem alcançar R$2,3 trilhões', 21 October 2019.

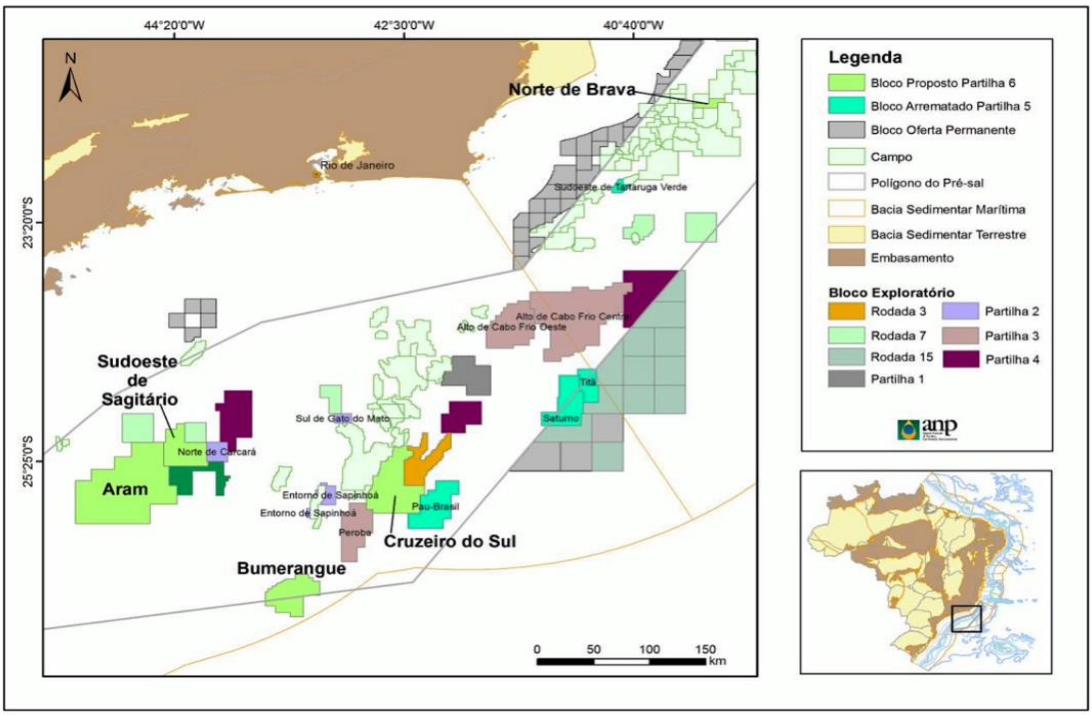
The TOR auction managed to raise R$70 billion ($17.5 billion), or 66 per cent of the intended result. The Atapu and Sepia fields had no offers, failing to raise the R$36.6 billion ($9.2 billion) expected for the Brazilian Government; they will be included in a future ANP bid round under the same business model, or a modified one to be reviewed by ANP and CNPE (the National Energy Policy Council).

On 7 November, the day after the massive TOR auction, the Sixth Production Sharing Bid Round of the pre-salt [Figure 5] offered five blocks with the following area, unrisked P50 volume of oil initially in place, and signature bonus:

1)	Norte de Brava	[148 km^2, 814 million, R$600 million],
2)	Cruzeiro do Sul	[1,860 km^2, 4.65 billion, R$1.15 billion],
3)	Sudoeste de Sagitario	[1,036 km^2, 1.54 billion, R$500 million],
4)	Aram	[4,476 km^2, 29 billion, R$5.05 billion],
5)	Bumerangue	[1,119 km^2, 3.63 billion, R$550 million].

Aram could be one of the three largest oil accumulations of the pre-salt Santos basin, and represents 73 per cent of the total potential volume initially in place in the auction.[14] Aram is located to the north of the giant Carcara discovery in Equinor's BM-S-8 block. Thirteen companies were approved to participate: BP, Chevron, CNODC, CNOOC, Ecopetrol, Exxon, Murphy, Petrobras, Petronas, Qatar Petroleum, Repsol Sinopec, Shell, and Wintershall Dea.

Figure 4: 6th Production Sharing Bid Round Acreage



Source: ANP

Petrobras and CNODC (with 80 per cent and 20 per cent participation respectively) presented the sole bid for the Aram block, agreeing to pay the R$5.05 billion ($1.25 billion) signature bonus and offering the Federal Government the minimum profit oil share of 29.96 per cent.

[14] '6th Production Sharing Bidding Round', ANP, http://rodadas.anp.gov.br/en/6th-production-sharing-bidding-round/seminars.

Was the outcome of the bid round auctions positive?

From a Government perspective, 66 per cent of the TOR auction objective was achieved raising R$70 billion ($17.5 billion) in signing bonuses – a net inflow of $8.5 billion after the $9 billion payment to Petrobras mentioned above. Government missed the opportunity to raise an additional $9.1 billion in this auction, but it can offer the same areas in 2020 under the same or modified terms, realize a higher net present value, and contribute to government finances. (The original 2010 agreement between the Brazilian Government and Petrobras had involved waiting 40 years to auction surplus reserves beyond the 5 billion barrels agreed with Petrobras.)

Petrobras asset sales have raised $12 billion this year so far:

- the TAG gas pipeline for R$33.5 billion ($8.6 billion) in April,
- the controlling stake in BR Distribuidora (fuel distributor) for R$9.6 billion ($2.55 billion) in July,
- Liquigas LPG business for R$3.7 billion ($919 million) in November.[15]

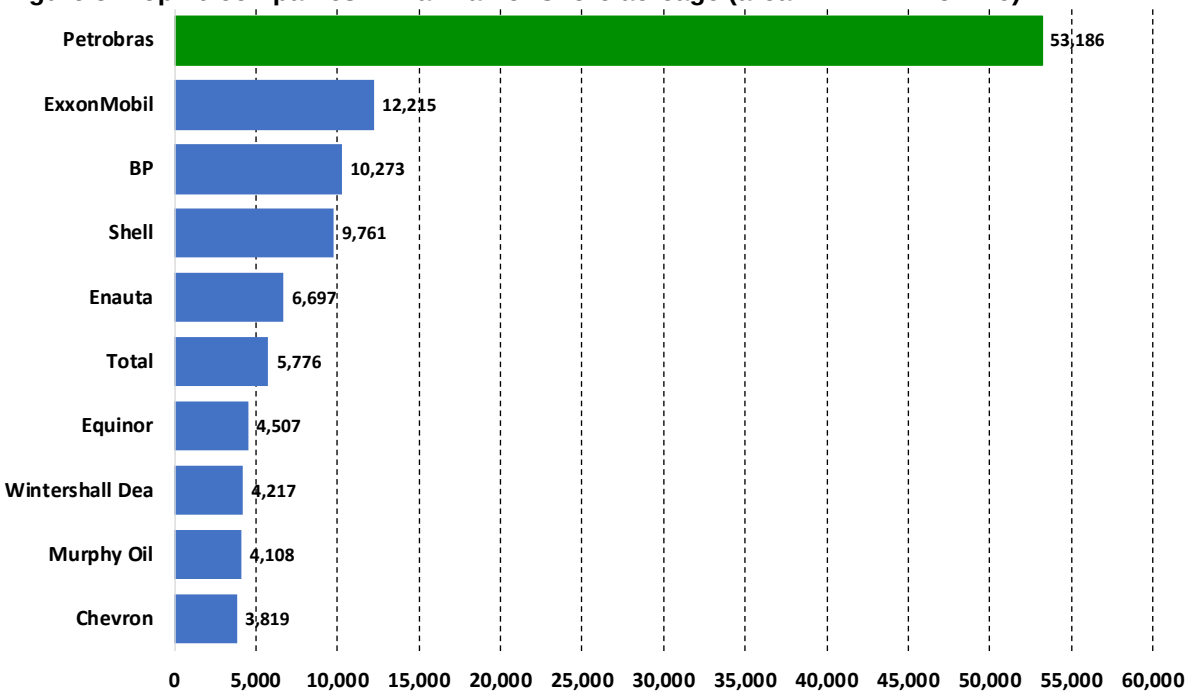
Asset sales, together with the $9 billion TOR settlement agreed with the Brazilian Government, enabled Petrobras to spend $16.9 billion in acquiring three world class upstream assets with significant economic upside, while still reducing its debt by $4 billion.

As a result of both bid rounds, Petrobras has increased its offshore acreage by 5,475 km^2, giving it a total of 53,186 km^2 and allowing the company to maintain a clear leadership in the Brazilian pre-salt region. Petrobras controls an offshore acreage area equivalent to the sum of the total areas held by eight international companies: ExxonMobil, BP, Shell, Total, Equinor, Wintershall Dea, Murphy Oil, and Chevron which together control 54,676 km^2 of offshore acreage [Figure 5].

Despite the positive outcomes for the Brazilian Government and Petrobras, international media reaction to the TOR auction was mixed, indicating steep prices, complex sharing rules, overlapping exploration and production regimes, expectation that the auction would mark a shift away from nationalistic oil policies, realization that larger expenditures would be needed from Petrobras to develop the fields with limited reimbursement from its 10 per cent partners, failure to attract participation from the large IOCs, and lower than expected government income from the auction. Petrobras shares lost 1 per cent and the Brazilian Real lost 2 per cent on the day of the TOR auction.[16,17]

[15] Nicola Pamplona, 'Petrobras vende Liquigas por R$3.7 bilhoes para consorcio de Copagaz e Itausa', Folha de Sao Paulo, 7 November 2019.
[16] Sabrina Valle, Peter Millard, and Luiza Ferraz, 'Brazil oil auction a "Total Disaster" as bidders stay away', Bloomberg, 6 November 2019.
[17] Bryan Harris, Carolina Pulice, and Andres Schipani, 'Brazil's blockbuster oil auction falls flat', *Financial Times*, 6 November 2019.

Figure 5: Top 10 companies – Brazilian offshore acreage (area in km^2 in Nov '19)



Source: Wood Mackenzie, ANP

In many ways, the TOR auction, with an unprecedented 10 billion barrels of reserves, was comparable with the auction conducted by Iraq in 2009 after the end of the Gulf War. The Iraqi auction was also considered to be economically unattractive but IOCs competed for upstream access in a country re-entry opportunity, to develop closer ties with the new Iraqi Government for additional future business. The majority of IOCs are already present in Brazil with growing portfolios, they have a good understanding of the fiscal and regulatory framework, and engage widely with Government entities and local industry.

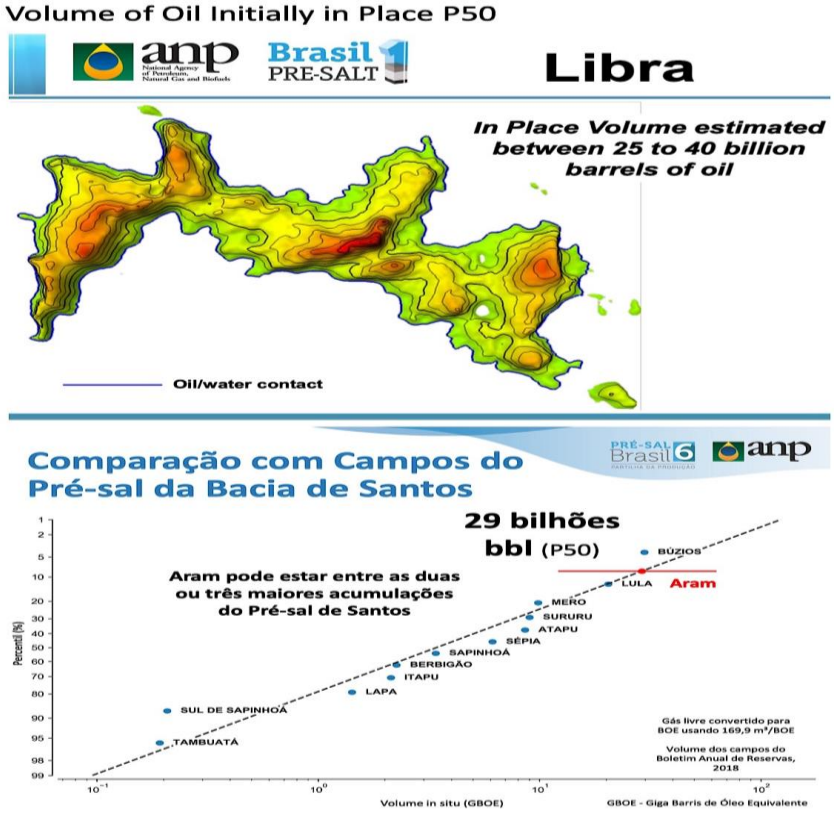
The TOR auction and crown jewel Buzios field was not perceived as sufficiently attractive by IOCs due to:

1) de-risked estimate of 3 billion barrels of recoverable reserves;
2) current production of 400 kbbl/d with four production units which have cost Petrobras about $20 billion;
3) requirement for the winner of the auction to agree with Petrobras a participation agreement (*after* winning the auction – creating an asymmetrical negotiation which most IOCs would avoid), compensation for previous expenditure, and access to a valuable asset;
4) payment of a high signature bonus of $17 billion.

The TOR auction in many ways was more akin to a reserve acquisition transaction with a potential upside, but with some commercial risks and an upfront cost deemed too high by IOCs.

The strong position of Petrobras in the Brazilian pre-salt – benefiting from preferential rights and diminished competition and interest from IOCs – did not deter major Chinese National Oil Companies (NOCs) keen to enlarge their equity positions in promising new sources of energy supply. China National Oil and Gas Exploration and Development Corporation (CNODC) participated in the Buzios and Aram winning bids, and China National Offshore Oil Corporation (CNOOC) participated in the Buzios winning bid.

Figure 6: Geological Assessment



Source: ANP

Brazil–China energy relationship increases in importance

The results of both the November 2019 auctions have reinforced the deep commercial ties between Brazil and China, with significant activities in agricultural and mining commodities, and close to 75 per cent of Petrobras' oil exports.

China and Brazil have already concluded strategic energy investments, to name a few:

- Libra and Mero fields (8–15 billion and 3.3 billion of oil reserves, respectively) where CNOOC and China National Petroleum Corporation (CNPC) each holds a 10 per cent shareholding,[18]
- COMPERJ, a $14 billion refinery project under construction (150,000 bpd initial phase) in Rio de Janeiro where CNPC is a 20 per cent shareholder as part of an integrated energy project that includes the Marlim oil field cluster (Marlim, Voador, Marlim Sul, and Marlim Leste) in the Campos basin,[19]
- the construction by China Petroleum & Chemical Corporation (Sinopec) of a significant section of the 1,387 km Gasene gas pipeline ($1.3 billion project) connecting the States of Espirito Santo and Bahia, for which the China Development Bank loaned $750 million to Sinopec in 2008.[20]

[18] Mero Oil Field, Libra Oil Field, Offshore Technology, www.offshore-technology.com.
[19] Robert Brelsford, 'Petrobras, CNPC advance partnership on Comperj refinery, Marlim field', *Oil & Gas Journal*, 23 October 2018.
[20] 'CDB loans $750 million USD for GASCAC Pipeline' (Project ID 35918), https://china.aiddata.org/projects/35918.

With partnerships in Libra (the largest pre-salt block with 4 to 15 billion barrels of oil reserves), Mero (3 billion barrels), the Marlim oil field cluster, Buzios, and Aram [Figure 6], China has gained access to leading pre-salt blocks in partnerships with Petrobras, Shell, and Total which will greatly enhance its NOCs' geological and operational knowledge when considering additional future opportunities.

As Brazil continues its trajectory to double its current oil production, the importance of China in the Brazilian energy scene is only likely to increase – as a Petrobras partner, independent investor, potential future operator, and the main importer of Brazilian oil. In 2018 China increased its oil imports from Brazil to $16.2 billion, making it the sixth largest exporter to China; this figure was 76.7 per cent higher than the previous year. Brazilian oil exports represent 6.8 per cent of total Chinese oil imports, and the country has the potential to become a top 3 oil exporter to China by 2030, surpassing Oman, Iraq, and Angola.[21]

Auction changes needed for additional growth

As the Brazilian pre-salt region matures and Petrobras successfully refocuses its activities in the upstream sector, the Brazilian authorities will need to consider adjustments to legislation and auction framework to increase attractiveness and competition, in order to allow the country to secure the necessary investments to further develop their world-class underground mineral resources. This should enable Brazil to convert these resources into above-ground socio-economic wealth for the country.

The National Energy Policy Council (CNPE) decides between either holding pre-salt bidding rounds or hiring Petrobras directly, in order to preserve the national interest and achieve other energy policy objectives. The blocks and the technical and economic parameters of the production sharing agreement are defined by CNPE, and the bidding round is promoted and conducted by the ANP.

The Brazilian pre-salt areas are auctioned under the production sharing regime created in 2010. The Brazilian Government owns the oil, and exploration and production companies are partners in the economic activity. Government determines the auction signing bonus, and the winner of the auction is the company or consortium offering the highest percentage of profit oil (after discounting the exploration and production costs) to Government. As part of this model, Petrobras was the sole operator of pre-salt assets, with a minimum 30 per cent participation, until the legislation changed in 2016 allowing international companies to operate; however, this still provided Petrobras with pre-emptive rights to operate with a minimum 30 per cent share.

In the concession regime, which has not yet been utilized for pre-salt assets, the concessionary assumes the exploration and production risk, but will own the oil and gas discovery. The concessionary pays the signature bonus, royalties, and a 'special participation' in the case of fields with large production volumes. In such bidding rounds, companies or consortia offer an amount for the signature bonus and a minimum exploratory programme with seismic and exploration wells. The most advantageous bid – in accordance with bid round terms and conditions – wins and receives the right to explore the area.

Brazil held five bidding rounds during 2017–18 focusing on the pre-salt region. The auctions sold 72 blocks achieving $8.0 billion in signature bonus [Table 1]. ANP estimates the combined auctions added 2.5 mbpd to peak oil production and $112 billion in new investments. In 2019, Brazil sold another 15 blocks achieving $20.9 billion in signature bonus. Excluding the TOR auction, the total signature bonuses achieved by concession rounds and by production sharing rounds during this period were almost the same at around $5.7 billion – with one key difference – the results achieved under the concession regime greatly exceeded original Government expectations, indicating a higher degree of competition for the assets on offer.

[21] Daniel Workman, 'Top 15 Crude Oil Suppliers to China', World's Top Exports, 6 October 2019.

Table 1: Brazilian Upstream Bid Rounds 2017–2019

Upstream Bid Round	Date	Expected Proceeds (R$ Billion)	Proceeds Achieved (R$ Billion)	% Achieved	Proceeds Achieved ($ Billion)
14th Concession	27/09/2017	1.90	3.80	200%	1.20
2nd and 3rd Production Sharing	27/10/2017	7.70	6.15	80%	1.89
15th Concession	29/03/2018	4.80	8.00	167%	2.40
4th Production Sharing	07/06/2018	3.20	3.15	98%	0.83
5th Production Sharing	28/09/2018	6.82	6.82	100%	1.70
16th Concession	09/10/2019	3.20	8.90	278%	2.17
Transfer of Rights	06/11/2019	106.50	69.96	66%	17.46
6th Production Sharing	07/11/2019	7.85	5.05	64%	1.25
Total Bid Round Results		**141.97**	**111.83**	**79%**	**28.90**
Sub-Total of Concession Rounds		9.90	20.70	209%	5.77
Sub-Total of Production Sharing		25.57	21.17	83%	5.67
Sub-Total of Transfer of Rights		106.50	69.96	66%	17.46

Source: ANP

In interviews after the TOR auction and the 6th production sharing bid round in November 2019, the Director General of ANP, the Minister of Mines and Energy, and the Secretary for Petroleum, Natural Gas and Biofuels indicated the need to reflect on the necessary changes required to increase participation in future upstream bid rounds.[22] Potential changes likely to be considered involve: 1) Review the pre-emption mechanism where Petrobras can declare pre-emptive rights for a block without being obliged to make a binding offer for the block; 2) Cease to provide Petrobras with a pre-emption right under the pre-salt production sharing contract; and/or 3) Offer pre-salt blocks under the concession contract framework.

Senator Jose Serra pushed forward in 2016 for changes in pre-salt production sharing contracts, ending the requirement for Petrobras to be the sole pre-salt operator with a minimum 30 per cent participation, and agreed with the current compromise of a pre-emptive right. Senator Serra is the author of a new bill (PL 3178/2019) to end the Petrobras pre-emptive right on pre-salt assets and allow CNPE the opportunity to decide if pre-salt areas are to auctioned under the production sharing or the concession regime. This bill has received favourable appreciation by the Senate Service and Infrastructure Committee and has support from the Ministry of Economy technical team.[23] The recent TOR auction and production sharing bid round results are likely to intensify support for the approval of PL 3178/2019 prior to 2020 bid rounds.

What's next for Brazil's upstream oil?

Given the significant portfolio building activity by Petrobras, IOCs, and NOCs, together with the sheer volume of signing bonuses paid over the last three years – R$112 billion ($29 billion) – the industry focus has shifted to finding, developing, and producing as much oil and gas as possible to confirm the operational and economic attractiveness of the upstream assets. The era of billion-sized blocks with record-breaking signature bonuses could be coming to an end, or at least to a pause for a while, as the demand for such capital-intensive mega upstream assets is not unlimited.

IOCs seek for opportunities with exploration risk, a chance to operate, and the economic upside to leverage their technical, operational, and financial competences. NOCs seek similar opportunities, but as representatives of foreign governments their commercial requirements can be more flexible, depending on a broader list of objectives and business between countries.

[22] 'Governo avalia que Petrobras inibiu a concorrencia pelo pre-sal', EPBR, 7 November 2019.
[23] Larissa Fafa, 'Jose Serra chama de blefe atuacao da Petrobras na 6a rodada do pre-sal', EPBR, 7 November 2019.

As Brazil remains on target to deliver 5.5 mbpd of oil by 2030, doubling national production in ten years, greater attention should to be paid to the attraction and development of the national human talent needed for the upstream industry and the wide array of technical and operational service providers. Brazil also needs to consider how to attract additional upstream players and indigenous companies to develop the smaller upstream assets onshore and offshore, and optimize the large offshore assets during their decline phase, when the large IOCs and NOCs consider farming out and moving to more promising assets elsewhere.

The challenge for Government, policy makers, and the regulator is to strike a balance between the speed of development and the level of value creation desired for the Brazilian upstream oil and gas sector, and how much economic interest and value the country is willing to concede to IOCs and foreign NOCs to achieve those objectives. Government agencies and the regulator are all acting with a welcome sense of urgency and pragmatism to produce as much of the wealth underground as possible while there is suitable demand for hydrocarbons. Ideally, the socio-economic multiplier of this industry should be maximized to ensure a lasting and relevant benefit is created for the country ahead of the expected drop in hydrocarbon consumption, as the world transitions to a society and economy with lower hydrocarbon use.