

RESULTS ESTIMATE OF PRODUCTION SHARING CONTRACTS

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MINAS E ENERGIA



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This study was conducted by Pre-Sal Petróleo, with the collaboration of the EPBR Agency, and aims to estimate, for the coming years, the investments and the oil and gas production, resulting from the 17 production sharing contracts (14 in force and three to be signed in March 2020). The study presents data up to 2032. We are aware, however, that the impact of the production sharing regime in Brazil will be much greater than that estimated here.

The 7th and 8th Rounds are scheduled for 2020 and 2021. During this period, the Sepia and Atapu blocks will also be offered again in a new Transfer of Rights Surplus Round. The results of the new contracts will certainly increase the projection.

PRODUCTION SHARING CONTRACTS

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The first production sharing contract was signed in October 2013 with the consortium formed by Petrobras (operator), Shell, Total, CNPC and CNOOC for the Libra area, in the Santos Basin, as a result of the 1st Production Sharing Round, promoted by the Brazilian National Agency for Petroleum, Natural Gas and Biofuels (ANP)

Under the production sharing regime, the Federal Government receives a share of the oil and natural gas production from each agreement. In the case of Libra, the consortium will transfer to the Federal Government 41.65% of the profit oil, a fraction that must be adjusted according to well productivity and oil price.

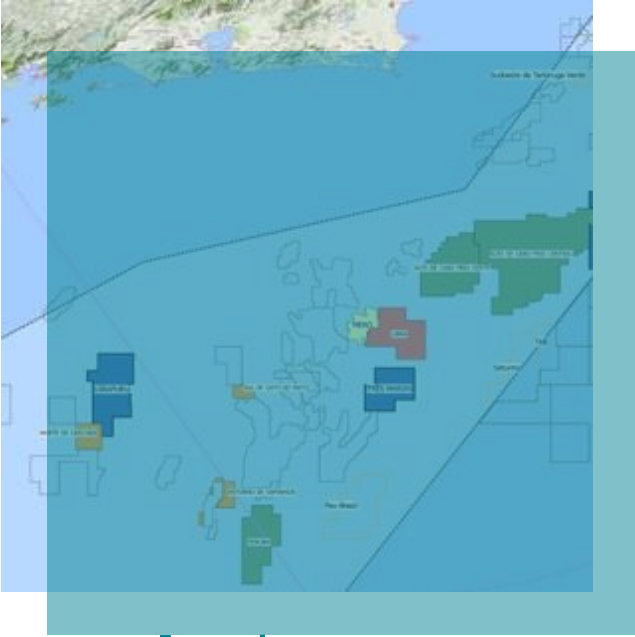


Photo: Petrobras Agency – FPSO Pioneiro de Libra



Also in 2013, the activities of Pré-Sal Petróleo were initiated, a public company linked to the Ministry of Mines and Energy (MME), which has, among its missions, the management of production sharing contracts.

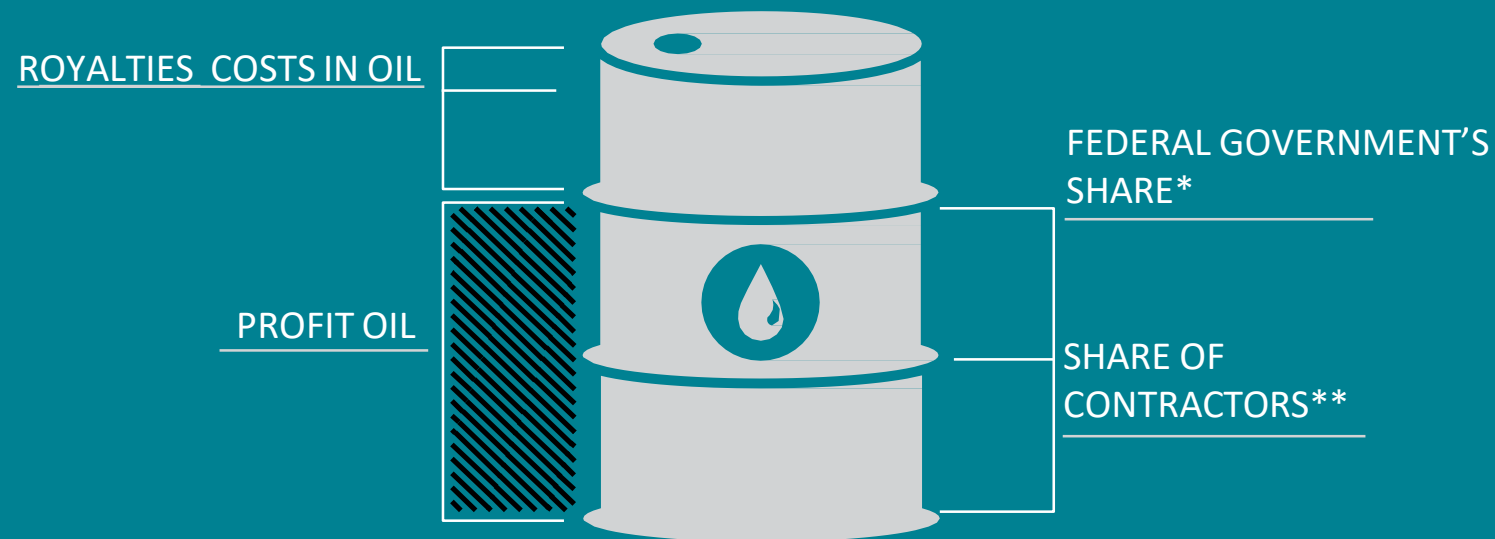
Today 14 Production Sharing Contracts (CPPs) are in force (Rounds 1 to 5). In March 2020, three other contracts will be signed, resulting from the Transfer of Rights Surplus Round and the 6th Production Sharing Round, which took place in November 2019. Operations and investments are carried out by 14 oil companies, which are part of consortia.



The Pre-Salt Polygon and the areas considered strategic - characterized by the low exploratory risk and high potential for production of oil and natural gas - are exploited under the production sharing regime. This model is used in places with great reserves and a large oil production volume.

In Brazil, aiming at preserving the national interest, the National Energy Policy Council (CNPE) authorizes the bidding of the areas, to be carried out by ANP. During the bidding rounds there are disputes for each block. In the current auction model, the bonus is fixed, and the participating consortium members that offer the largest share of profit oil to the Federal Government are considered the winners.

To calculate the share of the Federal Government and of the other partners in each project, the royalties paid and all the costs required by the operation, the so-called cost in oil, are deducted from the total production of each field. All the surplus is shared between the Federal Government, according to the percentage offered in the auction, and the contracted companies.



**Federal Government's Share: it varies with each contract, depending on the oil surplus offered by the consortium in the auction.*

***Share of contractors: established according to the participation of the partners in the consortium.*

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THE BRAZILIAN PRE-SALT

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The Pre-Salt Polygon is one of the largest oil provinces in the world. Several discoveries of giant and supergiant fields have been made in this area located between the Campos and Santos Basins, in deep waters of the Brazilian Continental Shelf.

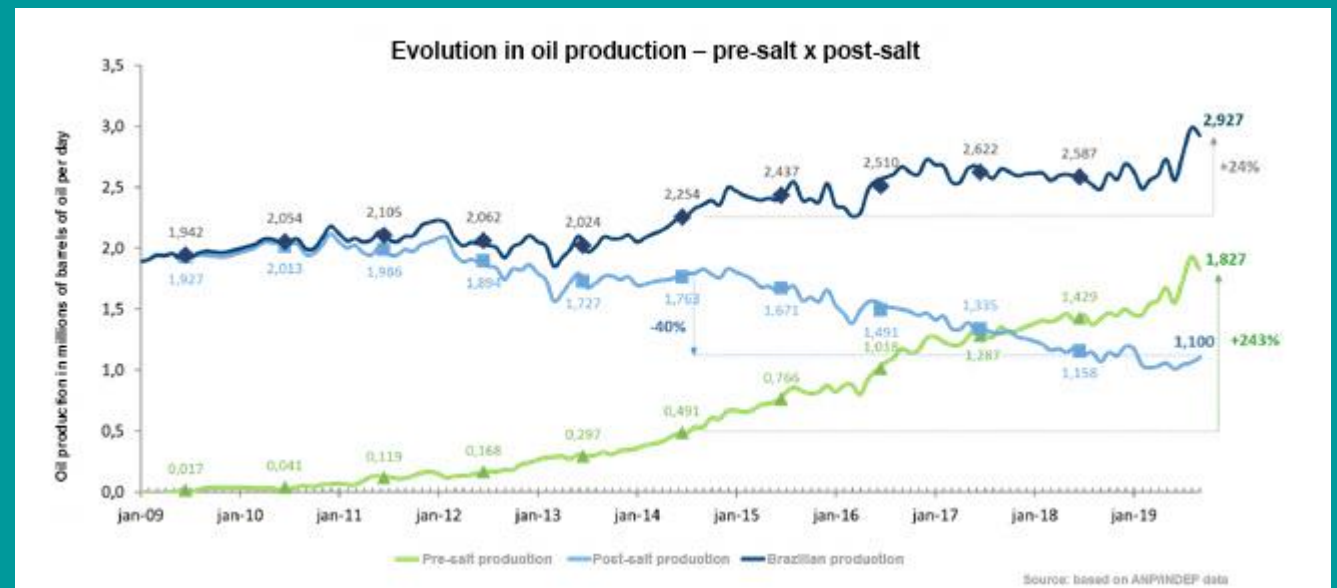
The total depth of the deposits - distance between the surface of the sea and the oil reservoirs below the layer of salt - can reach up to seven thousand meters. The reservoirs are composed of great accumulations of excellent quality oil, with a high commercial value.



Photo: FPSO Cidade de São Paulo, Simon Townsley - Petrobras Agency

The average pre-salt layer production in September 2019 (latest data available until this study was carried out) was 1.82 million barrels of oil per day and 73.3 million cubic meters of gas per day, totaling hydrocarbon production of 2.2 million barrels of equivalent oil per day. That month, 110 wells produced in the Brazilian pre-salt.

In the last 60 months, based on September data, the average production of oil from the pre-salt has grown 243%.



PROJECT PORTFOLIO OF PRÉ-SAL PETRÓLEO

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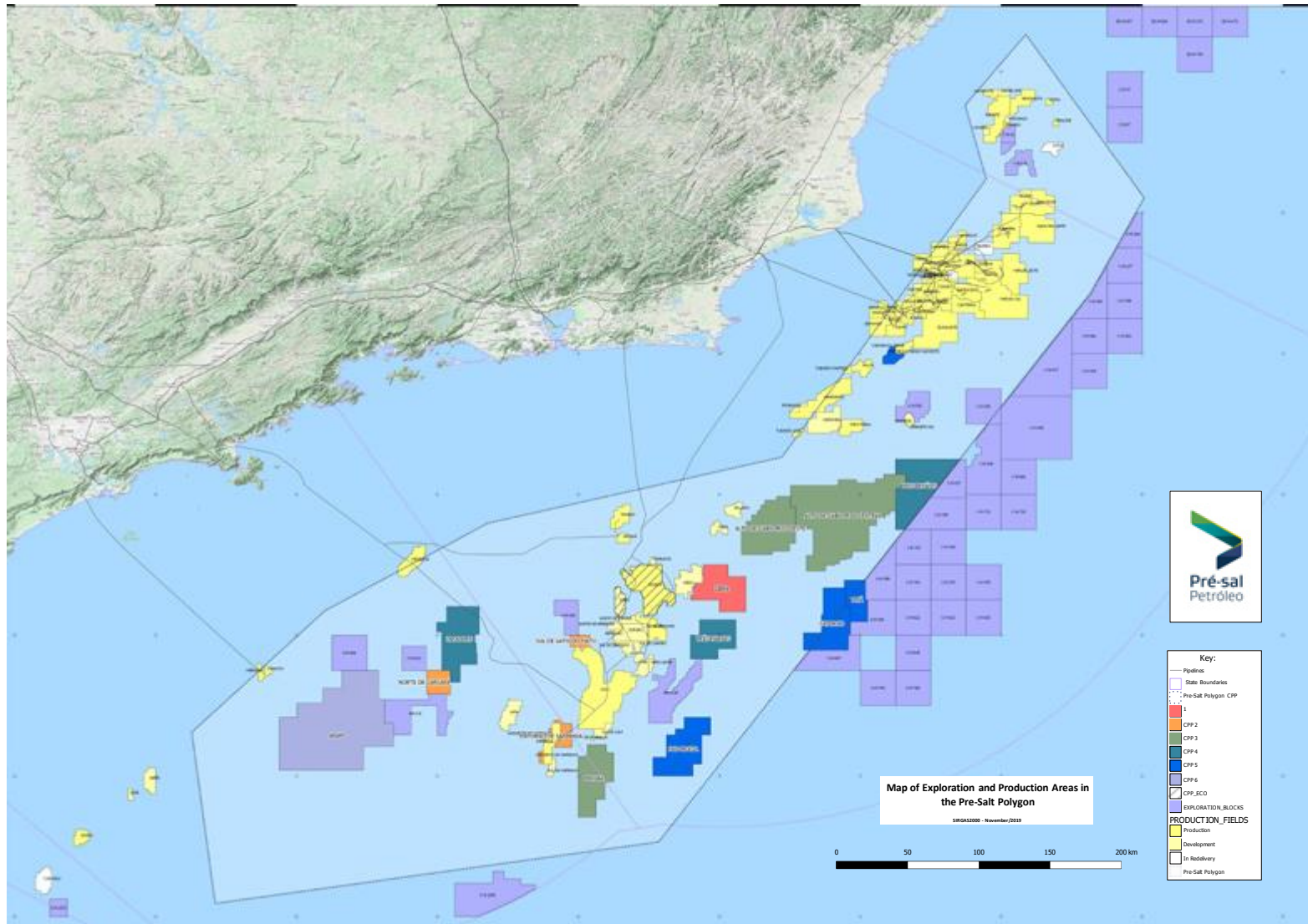
The table below shows the composition of the 17 Production Sharing Contracts. Pré-Sal Petróleo is the manager of all agreements.

Area	Round	Operator	Consortium Members	Minimum surplus oil of the Federal Government	Federal Government's surplus oil offered
Libra	1	Petrobras (40%)	Shell (20%), Total (20%), CNPC(10%), CNOOC(10%)	41,65%	41,65%
Gato do Mato South	2	Shell (80%)	Total (20%)	11,53%	11,53%
Sapinhoá Surroundings	2	Petrobras (45%)	Shell (30%), Repsol (25%)	10,34%	80%
Carcará North	2	Equinor (40%)	ExxonMobil (40%), Petropal (20%)	22,09%	67,12%
Peroba	3	Petrobras (40%)	BP (40%), CNOOC Brasil (20%)	13,89%	76,96%
Upper Cabo Frio Oeste	3	Shell (55%)	QPI (25%), CNOOC (20%)	22,87%	22,87%
Upper Cabo Frio Central	3	Petrobras (50%)	BP (50%)	21,38%	75,80%
Urupuru	4	Petrobras (30%)	ExxonMobil (28%), Equinor(28%), Petropal (14%)	22,18%	75,49%
Dois Irmãos	4	Petrobras (45%)	BP (30%), Equinor (25%)	16,43%	16,43%
Três Marias	4	Petrobras (30%)	Shell (40%), Chevron (30%)	8,32%	49,95%
Saturno	5	Shell Brasil (50%)	Chevron Brasil (50%)	17,54%	70,20%
Titã	5	ExxonMobil Brasil (64%)	QPI Brasil (36%)	9,53	23,49%
Pau-Brasil	5	BP Energy (50%)	CNOOC (30%) e Ecopetrol (20%)	14,40%	63,79%
Tartaruga Verde Southwest	5	Petrobras (100%)	Petrobras (100%)	10,01%	10,01%
Búzios	Onerous Assignment Surplus Round	Petrobras (90%)	CNOOC Brasil (5%) e CNOOC Petróleo (5%)	23,24%	23,24%
Itapu	Onerous Assignment Surplus Round	Petrobras (100%)	Petrobras (100%)	18,15%	18,15%
Azam	6	Petrobras (80%)	CNOOC Brasil (20%)	29,96%	29,96%



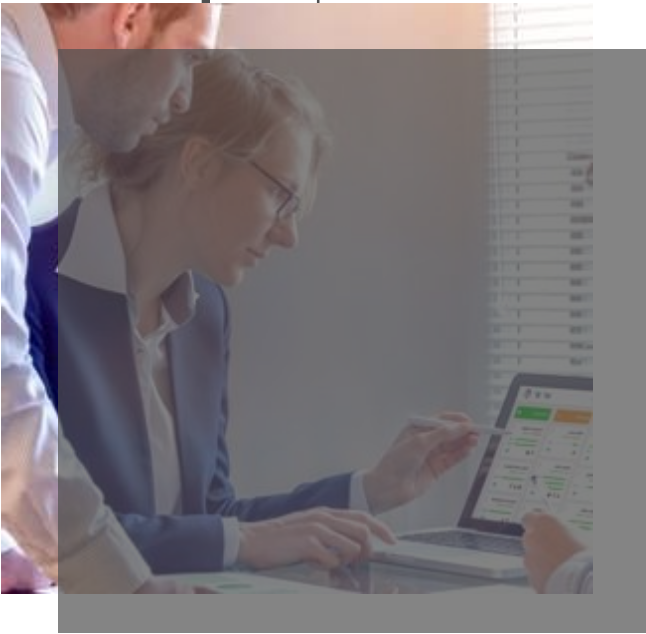
Photo: Búzios Onerous Assignment - André Ribeiro

LOCATION OF THE 17 PRODUCTION SHARING CONTRACTS



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- ◆ This study includes data from the 14 production sharing agreements under Pré-Sal Petróleo management and the three contracts to be signed in March 2020 (Búzios, Itaipu and Aram).
- ◆ The study adopted standard prices for oil and gas, being US\$60/barrel and US\$5/MMBtu, respectively.
- ◆ For first oil date and production curve, existing Development Plans were considered. As an alternative, the first oil was estimated for the other projects in eight years after the signing of the agreements and production curves were simulated, based on the volume of oil in place, geological/commercial success rate, maximum oil flow, ramp up time, plateau and production decline rate.



- ◆ For investments and costs, existing Development Plans were considered. For projects in the exploratory phase (without PD), cost assessments provided by Pré-Sal Petróleo technical area were used. Investments were also equally made in the three years preceding the first oil and in the year of the first oil.

- ◆ The study also includes the following variables: depreciation rate (10%); profit oil tax rate, oil cost recovery limit and signing bonus set for each project.

- ◆ For well calculation, one production well was considered for every 20,000 barrels of FPSO capacity. For each production well, one injector well was considered. One exploration well was considered per project. The use of FPSOs with production capacity between 50,000 and 220,000 barrels/day was considered, depending on the size of the project implemented.

- ◆ The study considers the exchange rate of R\$ 4.00/US\$.

Photo: Publicity: Pr3-Sal Petr3leo

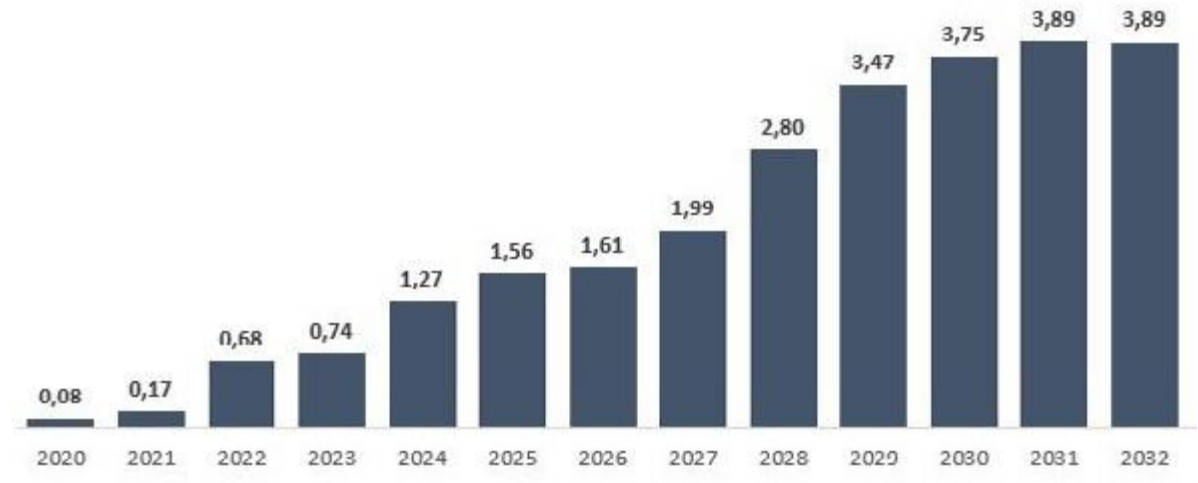


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ESTIMATED PRODUCTION

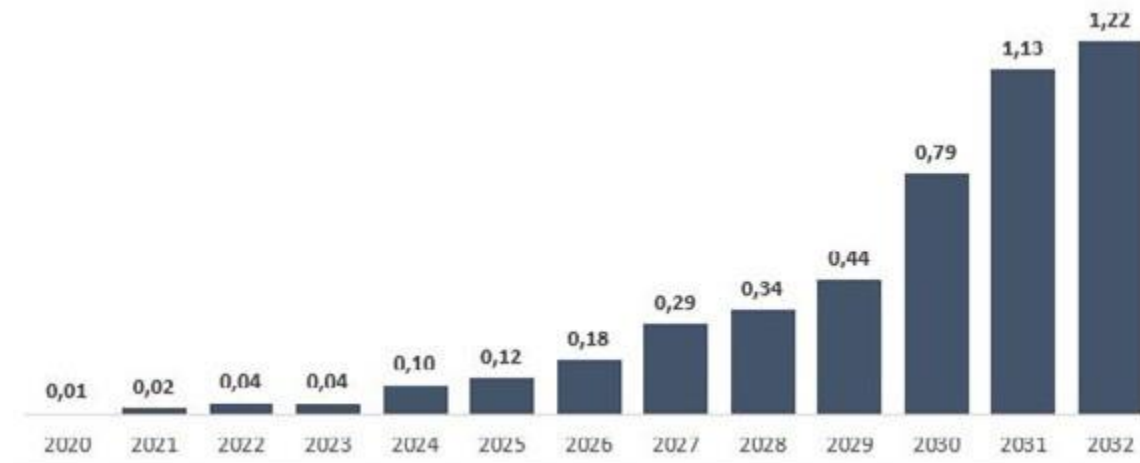
2020 - 2032

OIL PRODUCED UNDER SHARING REGIME (million barrels/day)



Considering the profit oil volumes offered to the Federal Government in the 17 contracts, in 2032, the year of the Federal Government's peak production, the projected share for the government is 1.22 million oil barrels/day.

TOTAL PROFIT OIL (million barrels/day)





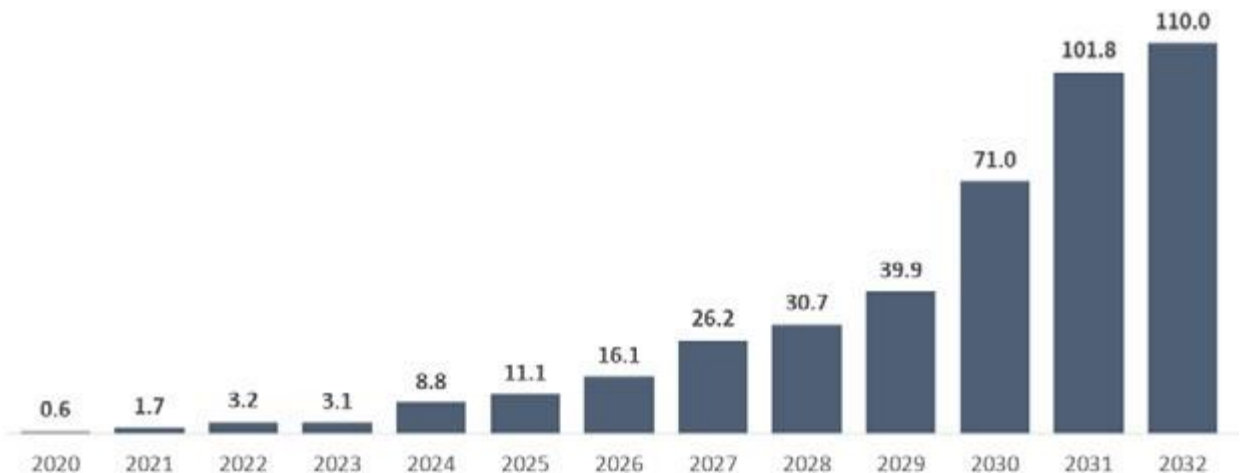
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GOVERNMENT SHARES

Government shares are divided into revenues from the trade of the Federal Government's profit oil share, royalties paid to the Federal Government, states and municipalities and taxes paid to the federal government.

The share of the Federal Government's oil and gas will be commercialized by Pré-Sal Petróleo. Considering an exchange rate of US\$ 4 and the price of a barrel at US\$ 60, the estimated revenue for the Federal Government from the sale of oil is R\$ 110 billion in 2032, when Federal Government production will peak at production. Between 2020 and 2032, the total projected revenue is R\$ 424 billion.

TRADING OF THE FEDERAL GOVERNMENT OIL AND GAS SHARE (R\$ billion)

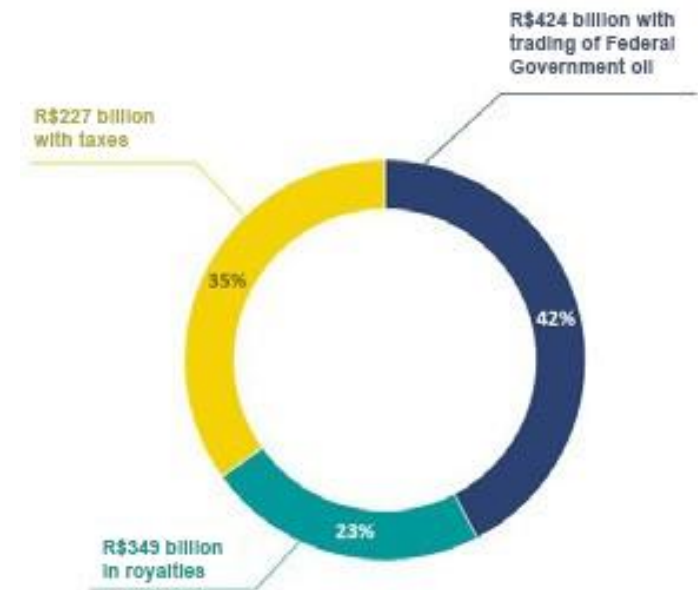


Considering the estimated revenue from the trade of Federal Government's oil, royalties to be paid for all agreements (R\$ 349 billion) and taxes paid to the federal government (R\$ 227 billion), government shares will reach R\$ 1 trillion in the period of 2020-2032.

Government Shares



■ ROYALTIES
 ■ PROFIT OIL
 ■ TAXES



INVESTMENT
EXPECTATIONS

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In order to develop the 17 production sharing contracts executed between 2013 and 2019, investments of R\$ 560 billion will be necessary between 2020 and 2032.

The estimate is based on the entry of the FPSOs to be contracted for the projects.

Total investments
R\$ 560 billion

Production platforms
R\$ 196 billion

Subsea systems
R\$ 168 billion

Wells
R\$ 196 billion

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DEMANDS BY THE INDUSTRY



2500 km of subsea lines



474 wells



28 FPSOs

ENTRY OF FPSOs INTO PRODUCTION

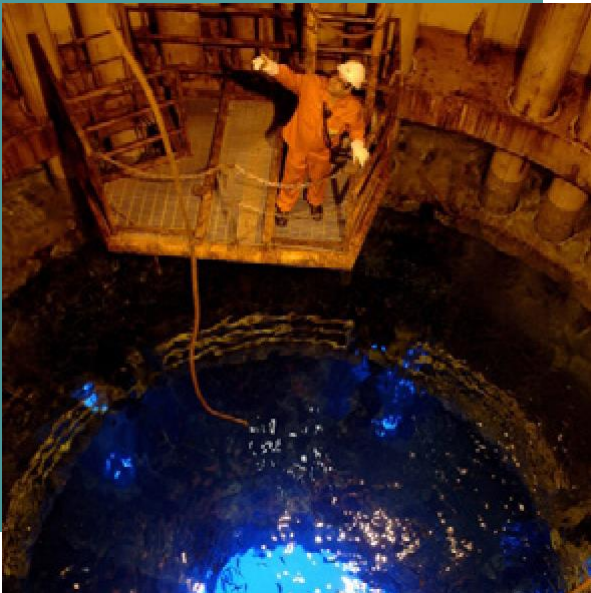
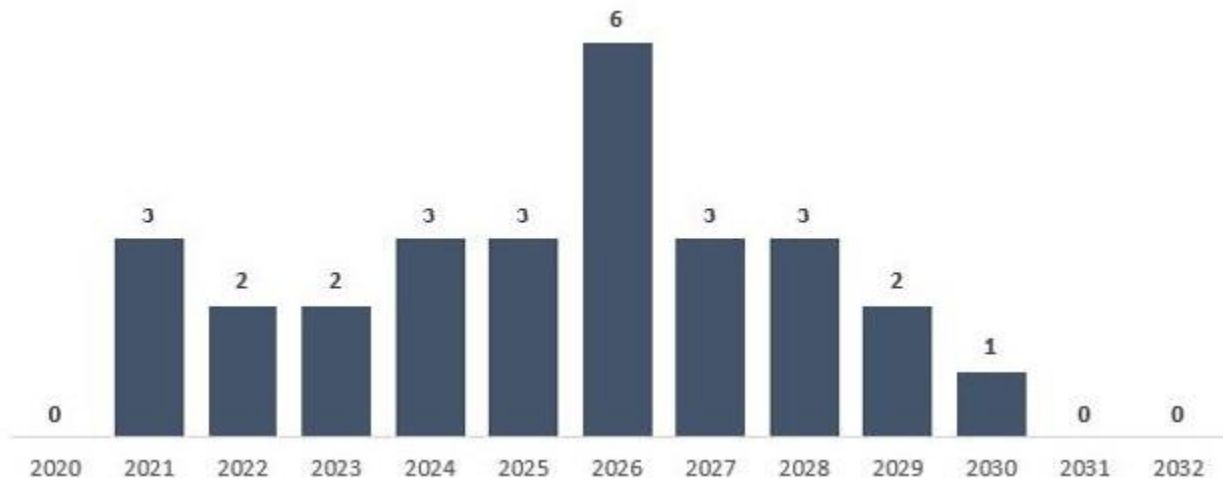


Photo: Jubarte - Bruno Veiga

**Study development**

Strategic Planning Advisory of Pré-Sal
Petróleo, in collaboration with EPBR
Agency

Sources

Pré-Sal Petróleo
Petrobras
Brazilian National Agency for Petroleum,
Natural Gas and Biofuels (ANP)
Brazilian Institute of Oil, Gas and
Biofuels (IBP)
Ministry of Mines and Energy (MME)

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