

P-68 platform - Berbigão and Sururu fields



Production & Sales Report

3Q19

3Q19 Production and Sales Highlights

Rio de Janeiro, October 17, 2019 - We posted a solid operating performance in 3Q19, delivering significant growth in oil, NGL and natural gas production, which reached 2,878 kboed, 9.3% higher than 2Q19, led by the 17.0% increase in pre-salt production, which reached 1,367 kboed, representing 60.4% of oil production in Brazil. Pre-salt's performance is due to the ramp-up of the 6 platforms that started up in 2018 and 2019 (P-74, P-75, P-76 and P-77 in Buzios field and P-67 and P- 69 in Lula field), which contributed 441 kbpd in 3Q19. Adding up the contribution of FPSO Cidade Campos dos Goytacazes in Tartaruga Verde field, in the post-salt, we totaled 555 kbpd, which represents an increase of c. 48% over 2Q19, with the start-up of nine producing wells. It is also worth mentioning that platforms P-69 and P-76, in Lula and Búzios fields, reached the production capacity of 150 kbpd with a ramp-up time of 10.3 and 7.7 months (a record in the pre-salt), respectively.

In 3Q19, production reached a new monthly record of 3.0 MMboed, in addition to a new daily record of 3.1 MMboed, both reached in August. The operated production reached the monthly record of 3.7 MMboed in the same month. With these results we maintain the trajectory to reach the annual production target, of 2.7 MMboed, with a variation of 2.5% up or down.

The P-68 platform, which will produce in the Berbigão and Sururu fields in the pre-salt, left the shipyard in September and is in the process of being moored. The project is expected to start operating in the fourth quarter of 2019. 11 wells have already been drilled, 8 producers and 3 injectors, and 5 of these wells are ready for interconnection.

Post-salt oil production was stable at 706 kbpd compared to 2Q19, while onshore and shallow water oil production increased 4.3% compared to 2Q19, reaching 192 kbpd.

In September, we celebrated 51 years of the first oil in the Brazilian continental shelf, eight kilometers off the coast of Aracaju, in a water depth of 33 meters, an event that marked the beginning of offshore production in Brazil. Nine years later, in August 1977, we produced the first oil at Enchova, in Campos Basin, four times deeper, marking the beginning of the success story that continued with the discovery of the giant fields in the following decades, until we reached the discovery of pre-salt, which today represents 60.4% of Brazil's oil production. Throughout our trajectory, we have been challenged to produce in ever-deeper depths of water, now exceeding 2,100 meters and 300 km offshore, safely and with successive offshore world records through innovative technologies.

In Campos Basin, we reinforced our commitment to invest in the acquisition of new exploration areas, complementary development, Marlim revitalization and strategic partnerships to increase the recovery factor. With this strategic vision, we participated in the 16th ANP concession bidding round, on October 10, 2019, in which we acquired, as an operator, in partnership with BP Energy do Brasil, block CM-477, where we identified a large geological potential.

In the refining segment, following the higher demand in the quarter in the Brazilian market, we increased the production of oil products by 2.9% compared to the previous quarter - which also contributed to the reduction of imports, especially gasoline and LPG -, through the higher utilization of the refining system (which grew from 76% to 80%) and conversion units. Oil products sales increased 3.2% over the previous quarter, led by the increase in diesel sales, which grew by 5.2%, driven by agricultural and industrial activity. LPG sales increased 3.2% compared to 2Q19 mainly due to lower average temperatures. There was also an increase in exports, following the higher oil production, and a reduction in oil imports with greater domestic oil feedstock in the refineries.

We highlight the continuous optimization of the integrated refining plants, which has been improved through digital transformation technologies, such as the use of Digital Twins. This tool allows us to simulate replicates of our refineries to maximize profitability of the refining activity and aims to accelerate decision making. Process optimization using this tool generated a gain of about US\$ 25 million in the quarter.

By reducing bunker sulfur content (marine fuel) according to IMO 2020, we are increasing bunker 0.5% production and low sulfur fuel oil streams, thereby capturing export opportunities and preparing to supply the market. The production of these streams amounted to 110 kbpd, an increase of 139% over 2Q19, which was 46 kbpd. It is worth mentioning that our refining system is well positioned to capture these opportunities due to the feedstock that favor the production of these streams.

In the gas and energy segment, thermoelectric generation stood out, with an increase of 124.6% over the previous quarter reflecting hydrological conditions and lower natural gas costs, and the increase in 9 MMm³/day of natural gas supply to meet thermoelectric demand.

1- Exploration & Production

Thousand barrels of oil equivalent per day (Kboed)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Crude oil, NGL and natural gas - Brazil	2,794	2,553	2,398	2,604	2,514	9.5	16.5	3.6
Crude oil and NGLs (Kbpd)	2,264	2,052	1,937	2,097	2,028	10.3	16.9	3.4
Onshore	123	122	131	125	136	0.7	(6.3)	(8.5)
Shallow water	69	62	89	69	92	9.8	(22.7)	(24.9)
Post-salt - deep and ultra deep	706	700	742	712	823	0.8	(4.9)	(13.5)
Pre-salt	1,367	1,168	975	1,191	977	17.0	40.2	22.0
Natural gas (Kboed)	530	500	462	507	486	5.9	14.8	4.3
Crude oil, NGL and natural gas - abroad	84	81	114	81	103	4.7	(26.1)	(21.4)
Total (Kboed)	2,878	2,633	2,513	2,685	2,617	9.3	14.6	2.6

Oil, NGL and natural gas production totaled 2,878 kboed in 3Q19, an increase of 9.3% over 2Q19 and 14.6% over 3Q18, mainly due to the ramp-up of the 7 new systems that went into production in 2018 and 2019 in the Búzios field (P-74, P-75, P-76 and P-77), Lula (P-67 and P-69) and Tartaruga Verde (FPSO Campos dos Goytacazes).

Compared to 2Q19, pre-salt oil production increased by 17.0%, led by Búzios field, which increased production by 64% in 3Q19, with the start-up of four producing wells. In 3Q19, pre-salt oil production increased by 40.2% over 3Q18, mainly reflecting the start-up of new producing wells in the Lula and Búzios fields and in line with our strategy of concentrating efforts in assets that generate the highest return for our shareholders.

Deep and ultra-deepwater post-salt oil production remained stable in 3Q19 compared to the previous quarter as a result of efforts to increase the productivity of the Campos Basin platforms and the start-up of new producing wells into the FPSO Cidade de Campos dos Goytacazes in Tartaruga Verde field, which compensated the natural production decline in this region. Compared to 3Q18, there was a 4.9% reduction, due to the decline in production, partially offset by the start-up of new wells in the Tartaruga Verde field.

Oil production in shallow waters, non core assets and subject to divestment, was 69 kbpd in 3Q19, an increase of 7 kbpd compared to 2Q19, due to the return to production of the PPM-1 and PCH-2 platforms, which had stopped for maintenance in the previous quarter. Compared to 3Q18, there was a decrease of 22.7%, due to the natural decline and the shutdown of the PCP-1, PCP-2 and P-9 platforms.

Oil production in the onshore fields totaled 123 kbpd in 3Q19, in line with 2Q19 and reducing by 8 kbpd compared to 3Q18. Onshore fields are included in the Company's portfolio optimization processes.

2 - Refining

Thousand barrels per day (kbpd)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Total production volume	1,816	1,765	1,801	1,774	1,774	2.9	0.8	-
Total sales volume	1,805	1,745	1,941	1,763	1,794	3.4	(7.0)	(1.7)
Reference feedstock	2,176	2,176	2,176	2,176	2,176	-	-	-
Refining plants utilization factor (%)	80	76	78	77	77	5.3	2.6	-
Processed feedstock (excluding LNG)	1,740	1,665	1,693	1,681	1,672	4.5	2.8	0.5
Processed feedstock	1,791	1,707	1,743	1,724	1,726	4.9	2.8	(0.1)
Domestic crude oil as % of total	90	89	88	90	92	1.1	2.3	(2.2)

Oil products output in 3Q19 reached 1,816 kbpd, an increase of 2.9% over 2Q19. This growth is mainly due to the demand expansion in the domestic market, which was met with a higher refining utilization factor, which reached 80% in 3Q19 against 76% in 2Q19. The refinery utilization factor is set on a monthly basis, being the result of the integrated refining system optimization, through a planning process that, based on the availability of oil and the assets, as well as demand forecasts, indicates the solution with the best economic result for the whole system.

The main production highlights were gasoline and LPG, as a result of the higher utilization factor of the catalytic cracking units, and bunker, due to its price appreciation in the international market. On the other hand, there was a drop in diesel production, and a consequent increase in imports to meet demand, due to the use of some of its streams for bunker production.

2.1- Diesel

Thousand barrels per day (kbpd)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Production volume	710	720	750	703	708	(1.4)	(5.3)	(0.7)
Sales volume for the Brazilian market	770	732	843	734	714	5.2	(8.7)	2.8

Diesel production in 3Q19 fell 1.4% and 5.3% compared to 2Q19 and 3Q18, respectively. The lower 3Q19 numbers were mainly due to the use of diesel streams for the production of bunker 0.5%, in line with IMO 2020 specifications. This was necessary in order to reduce the sulfur content of the final product and it proved to be economically advantageous.

Diesel sales increased 5.2% in 3Q19 compared to 2Q19 due to seasonality, with higher consumption in the third quarter due to the summer grain crop and to the industrial activity. As for mitigating factors, sales by competitors increased in 3Q19 and there was an increase in the average biodiesel content in diesel formulation between the periods, from 10.0%, the minimum percentage required since March 2018, to 11.0% from September 1st, leading to a rise of diesel prices at the pump. Compared to 3Q18, sales fell mainly due to the increase in the competitors market share.

2.2 - Gasoline

Thousand barrels per day (kbpd)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Production volume	416	388	384	398	398	7.2	8.3	-
Sales volume for the Brazilian market	377	367	387	376	401	2.6	(2.7)	(6.1)

In 3Q19, gasoline production increased by 7.2% compared to 2Q19 and 8.3% compared to 3Q18, as a result of the higher demand in the Brazilian market, which has been met by the increase in the use of catalytic cracking units. In addition, the lower demand for petrochemical naphtha in Brazil led to a production optimization, with naphtha streams being directed to the gasoline pool.

Gasoline sales in 3Q19 were 2.6% higher than in 2Q19 due to the drop in average consumer prices. As a mitigating factor there was an increase in imports by competitors QoQ, which grew from 52 kbpd in 2Q19 to 62 kbpd in 3Q19. Compared to 3Q18, sales decreased by 2.7% due to higher imports by competitors. It should be noted that gasoline consumption was positively influenced by the increase in ethanol average prices between the periods.

2.3- Fuel Oil

Thousand barrels per day (kbpd)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Production volume	197	176	180	190	183	11.9	9.4	3.8
Sales volume for the Brazilian market	38	38	58	40	47	(1.9)	(34.8)	(14.9)

Fuel oil production increased 11.9% in 3Q19 compared to 2Q19, mainly due to the higher utilization of distillation units and to the beginning of the bunker 0.5% production, whose price appreciation allowed for increased exports under better economic conditions. IMO 2020 also brought export opportunities to the 0.7% sulfur fuel oil, especially to the Singapore market.

Fuel oil sales in Brazil were in line with 2Q19. There was a reduction in deliveries to thermoelectric plants but, in contrast, there were increased deliveries to Alunorte due to the resumption of its operations in the second half of May. Compared to 3Q18, sales were lower due to lower thermoelectric demand.

2.4- Naphtha

Thousand barrels per day (kbpd)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Production volume	73	82	83	75	69	(11.0)	(12.0)	8.7
Sales volume for the Brazilian market	72	85	102	83	97	(15.2)	(29.0)	(14.6)

Naphtha production in 3Q19 decreased by 11.0% compared to 2Q19, mainly due to the lower demand for this oil product in the Brazilian market, which was entirely met by our own production. In addition, part of the volume of naphtha production went to gasoline production.

2.5- Liquefied Petroleum Gas (LPG)

Thousand barrels per day (kbpd)	Variation (%)							
	3Q19	2Q19	3Q18	9M19	9M18	3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Production volume	137	122	129	126	127	12.3	6.2	(0.8)
Sales volume for the Brazilian market	240	232	242	229	232	3.2	(1.0)	(1.5)

LPG production increased by 12.3% in 3Q19 over 2Q19 to meet market expansion (due to the winter period) through the increase of catalytic cracking units utilization. Compared to the same period of 2018, the 6.2% increase is due to the higher utilization and availability of conversion units, especially catalytic cracking units.

LPG sales increased 3.2% compared to 2Q19 mainly due to lower average temperatures and seasonality of LPG consumption due to higher economic activity in the period.

2.6- Jet Fuel

Thousand barrels per day (kbpd)	Variation (%)							
	3Q19	2Q19	3Q18	9M19	9M18	3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Production volume	101	105	100	106	111	(3.8)	1.0	(4.5)
Sales volume for the Brazilian market	116	114	126	119	122	2.3	(7.7)	(2.6)

In 3Q19, jet fuel production volume remained stable compared to 2Q19 and 3Q18.

Jet fuel sales in 3Q19 increased 2.3% over 2Q19 as a consequence of stronger seasonality in the third quarter due to July school holidays in Brazil and the northern hemisphere holidays in August, as well as the reduction in the international price of jet fuel. Compared to 3Q18, sales were down 7.7% due to the adjustment in the domestic airline sector in 2019.

3- Gas & Power

	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Thermal availability - Average MW	2,788	2,788	2,788	2,788	2,788	-	-	-
Contract sales - Average MW	1,154	1,194	1,142	1,167	1,239	(3.4)	1.1	(5.8)
Generation of electricity - average MW	2,190	975	3,371	1,856	2,533	124.6	(35.0)	(26.7)
Settlement price of the differences SE / CO - R\$ / MWh	214	131	495	210	332	63.4	(56.8)	(36.7)
National gas delivery (MM m ³ / day)	52	49	42	50	48	6.1	23.8	4.2
Regasification of liquefied natural gas (MM m ³ / day)	13	8	19	9	9	62.5	(31.6)	-
Imports of natural gas (MM m ³ / day)	14	13	24	15	23	7.7	(41.7)	(34.8)
Sales volume of natural gas - MM m ³ / day	78	70	85	75	80	11.4	(8.2)	(6.3)

Electricity generation averaged 2,190 MW in 3Q19, an increase of 124.6% over 2Q19. This increase can be explained mainly by two factors: (i) higher dispatch on merit due to the higher settlement price of the differences value, reflecting worse hydrological conditions with lower inflows in rivers and basins, impacting reservoir levels; and (ii) higher off-merit power generation, due to lower fuel costs and better remuneration by the settlement price of the differences.

The 35.0% drop in thermoelectric power generation between 3Q19 and 3Q18 was due to the improved hydrological scenario compared to the previous year, which led to an increase in the level of water storage in the reservoirs.

Natural gas sales volume was 78 MMm³/day in 3Q19, representing an increase of 11.4% over 2Q19, due to the higher natural gas thermoelectric dispatch, with the volume growing from 17 MMm³/day to 26 MMm³/day. In the same period, the volume of natural gas supplied to the non-thermoelectric segment was stable at 38.5 MMm³/day.

In 2019, the lower prices of liquefied natural gas (LNG) in the international market allowed us to opt for higher imports of this product - to the detriment of Bolivian gas imports - to complement the natural gas supply.

Annex I: Consolidated Sales Volume

Thousand barrels per day (kbpd)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Diesel	770	732	843	734	714	5.2	(8.7)	2.8
Gasoline	377	367	387	376	401	2.6	(2.7)	(6.1)
Fuel oil	38	38	58	40	47	(1.9)	(34.8)	(14.9)
Naphtha	72	85	102	83	97	(15.2)	(29.0)	(14.6)
LPG	240	232	241	229	232	3.2	(1.0)	(1.5)
Jet Fuel	116	114	126	119	122	2.3	(7.7)	(2.6)
Others	172	156	160	161	161	10.3	7.5	-
Total oil products	1,785	1,724	1,917	1,742	1,774	3.5	(6.9)	(1.8)
Alcohols, nitrogenous, renewable and others	4	7	17	8	18	(42.9)	(76.5)	(55.6)
Natural gas	356	323	367	339	352	10.2	(3.0)	(3.7)
Total domestic market	2,145	2,054	2,301	2,089	2,144	4.4	(6.8)	(2.6)
Exports of crude oil, oil products and other	802	606	497	691	582	32.3	61.4	18.7
Sales from international units	78	67	231	104	238	16.4	(66.2)	(56.3)
Total external market	880	673	728	795	820	30.8	20.9	(3.0)
Grand total	3,025	2,727	3,029	2,884	2,964	10.9	(0.1)	(2.7)

Annex II: Net Exports and Imports

Thousand barrels per day (kbpd)	3Q19	2Q19	3Q18	9M19	9M18	Variation (%)		
						3Q19 / 2Q19	3Q19 / 3Q18	9M19 / 9M18
Net export (import)	469	217	58	336	258	116.1	708.6	30.23
Import	332	389	438	354	323	(14.7)	(24.2)	9.6
Crude Oil	153	189	207	173	157	(19.0)	(26.1)	10.2
Diesel	87	51	91	69	47	70.6	(4.4)	46.8
Gasoline	14	36	17	25	9	(61.1)	(17.6)	177.8
Naphtha	-	14	18	9	26	(100.0)	(100.0)	(65.4)
GLP	55	85	68	62	67	(35.3)	(19.1)	(7.5)
Other oil products	23	14	37	16	17	64.3	(37.8)	(5.9)
Export	801	606	496	690	581	32.2	61.5	18.8
Crude Oil	583	416	322	498	415	40.1	81.1	20.0
Fuel oil	131	129	137	125	125	1.6	(4.4)	-
Other oil products	87	61	37	67	41	42.6	135.1	63.4

Net exports increased by 252 kbpd to 469 kbpd in 3Q19, mainly due to higher oil exports following the increase in production. In addition, there was also an increase in gasoline exports due to the higher production of this oil product. Reduced imports of oil and oil products also contributed to the increase in net exports.

Compared to 3Q18, net exports increased by 411 kbpd, also due to the increase in oil exports. Between these quarters there was also a reduction of 106 kbpd in oil and oil products imports.

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