

An Update on Brazil's Oil & Gas Opportunities

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30 January 2019



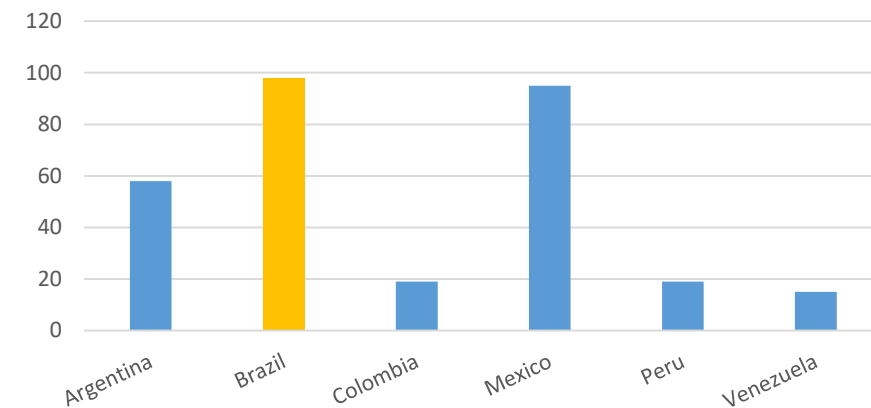
State of Play- Brazil

- 12.8 Bbbl of proven oil reserves, 369.9 Bcf of gas
- Oil production: 2.63 MMbbl/d in Dec 2018, largest oil producer in Latin America.
- Gas production: 117 MMcm/d in Oct 2018 (78% of which is associated gas)
- Three E&P environments:

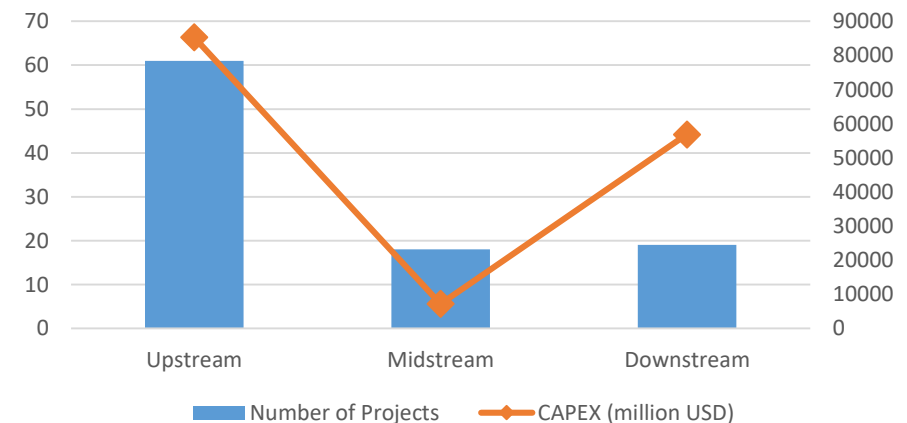
Field type	Participation in national oil production	No. of production wells	Avg output per well
Pre-salt	55%	87	16,712 b/d
Other offshore	37%	631	1,603 b/d
Onshore	8%	6,765	16 b/d

Sources: EICDataStream, National Petroleum Agency (ANP)

Oil & Gas Projects in Latin America



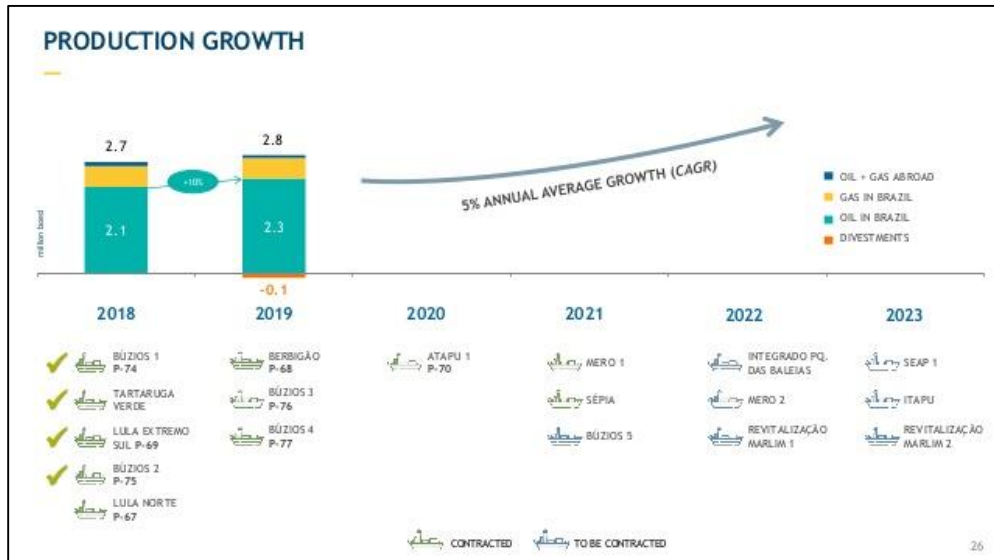
Brazilian O&G Projects on EICDataStream



Petrobras



- \$84.1bn investment plan for 2019-23 up 12% from previous plan for 2018-22
- \$68.8bn (82%) allocated to E&P
- Of upstream CAPEX \$20.5 billion to be invested in Campos Basin
- Ambitious pre-salt portfolio:



Mero Field (Pilot) Guanabara FPSO 180k b/d Modec 2021	Sépia Field (Phase 1) Carioca FPSO 180k b/d Modec 2H 2021	Búzios Field Buzios V FPSO 180k b/d Exmar? Q4 2021?
Mero Field (Phase 2) 180k b/d FPSO Bids expected on 14 February 2022	Marlim Field Marlim 1: 80k b/d Marlim 2: 70k b/d Bids submitted- 25 January 2022 and 2023	P. das Baleias 100k b/d FPSO Bids expected on 1 March 2022
Itapu Field 120k b/d FPSO Tender to be launched by year-end. 2023	Mero Field (3 & 4) Two 180k b/d FPSOs Tenders to be launched in mid-2019	SE-AL blocks Two FPSOs, FID on first module in late 2020 2023

Sources: EICDataStream, Petrobras

Projects by IOCs in Brazil



- Peregrino 2
 - New wellhead platform
 - Start-up in 2020
 - Main contractors: Kiewit, Heerema, TechnipFMC, Cameron Sense
- Carcará
 - Oil discoveries announced at Carcara North and Carcara West
 - To feature FPSO
 - Start-up in 2023/24
- Pão de Açúcar
 - Major gas reserves (3Tcf) and 700 MMboe oil
 - To feature FPSO
 - Major subsea gas pipeline under consideration



- Gato do Mato
 - QGOG's Brava Star drillship to drill one well at Gato do Mato Sul, beginning in 2019
 - FPSO deployment is likely
- Alto de Cabo Frio Oeste
 - Block acquired at 3rd bidding round
 - Drilling to begin in 2019, also using Brava Star

Recent Offshore E&P contracts

Operator	14th BD (27 Sep 17)	2nd/3rd PSA rounds (27 Oct 17)	15th BD (29 Mar 18)	4th PSA round (7 Jun 18)	5th PSA round (28 Sep 18)	Total
Petrobras	6	3	5	3	1	18
ExxonMobil	4		6		1	11
Shell		2	2		1	5
Wintershall			4			4
Repsol	1		2			3
BP			2		1	3
Chevron			1			1
CNOOC	1					1
Equinor		1				1
Karoon	1					1
Total	13	6	22	3	4	<u>48</u>

BD: Bidding round
PSA: production sharing agreement

These blocks will demand at least 20 production units, according to the ANP

Midstream and Downstream Projects



Midstream

- Sergipe LNG Terminal
 - Due onstream in March 2019
 - Is an example of the first privately operated LNG terminal in Brazil
 - Main contractors: Golar,
- Acu LNG Terminal
 - FSRU deployment
 - Due onstream in 2020
 - Main contractors: BW Offshore, DSME
- Sergipe Gas Processing Plant
 - To receive gas from blocks BM-SEAL-10 and BM-SEAL-11
 - Due onstream in 2023
 - Is in early concept design- part of Petrobras's 2019 to 2023 plan
- Sergipe-Alagoas Pipeline

Downstream

- Comperj Refinery
 - \$16 billion CAPEX spend
 - Partnership between Petrobras and CNODC
 - Indicates international interest in downstream Brazil
- Tres Lagoas Nitrogen Fertiliser Complex
 - Part of Petrobras's downstream portfolio
 - Was unfinished from 2015 onwards at 82% complete
 - Petrobras intends to sell it to Acron
 - Supreme Court has blocked the transaction
- Bacabeira Refinery
 - Is in place of Petrobras's Premium I refinery
 - Operated by Sinopec
 - Is currently acquiring environmental and regulatory permits
 - Around \$10 billion in future CAPEX spend

Summary



- Pre-salt is a reality and will remain a priority- in January 2018 pre-salt output overtook post-salt output for the first time in history
- Brazilian projects to remain a driving force in the global FPSO market
- It's not just Petrobras anymore
- No major changes in energy policy under Bolsonaro administration:
 - Bidding rounds to be maintained (including pre-salt rounds)
 - Local content to be phased out gradually in new E&P contracts
 - Greater participation of private sector in midstream infrastructure
 - Boost to unconventional



Thank you!

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