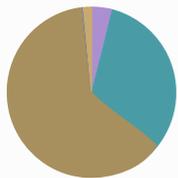


Brazil • Fossil fuels • Unconventional

Unconventional reserves by fuels, Billion tonnes of oil equivalent (%)



- Shale oil (tight light) 0.72 (3.7)
- Shale gas 6.25 (32.0)
- Oil shale (kerogen) 12.24 (62.7)
- Coal mine methane utilization potential 0.07 (0.3)
- Associated petroleum gas 0.25 (1.3)

Total: 19.53 (100)

Sources: Based on the U.S. EIA 2015 data (Sep 2023); U.S. Geological Survey SIR 2005-5294 (Sep 2023); U.S. EPA 2017 (Sep 2023); Agência Nacional do Petróleo, Gás Natural e Biocombustíveis; Brasil Balanço Energético Nacional.

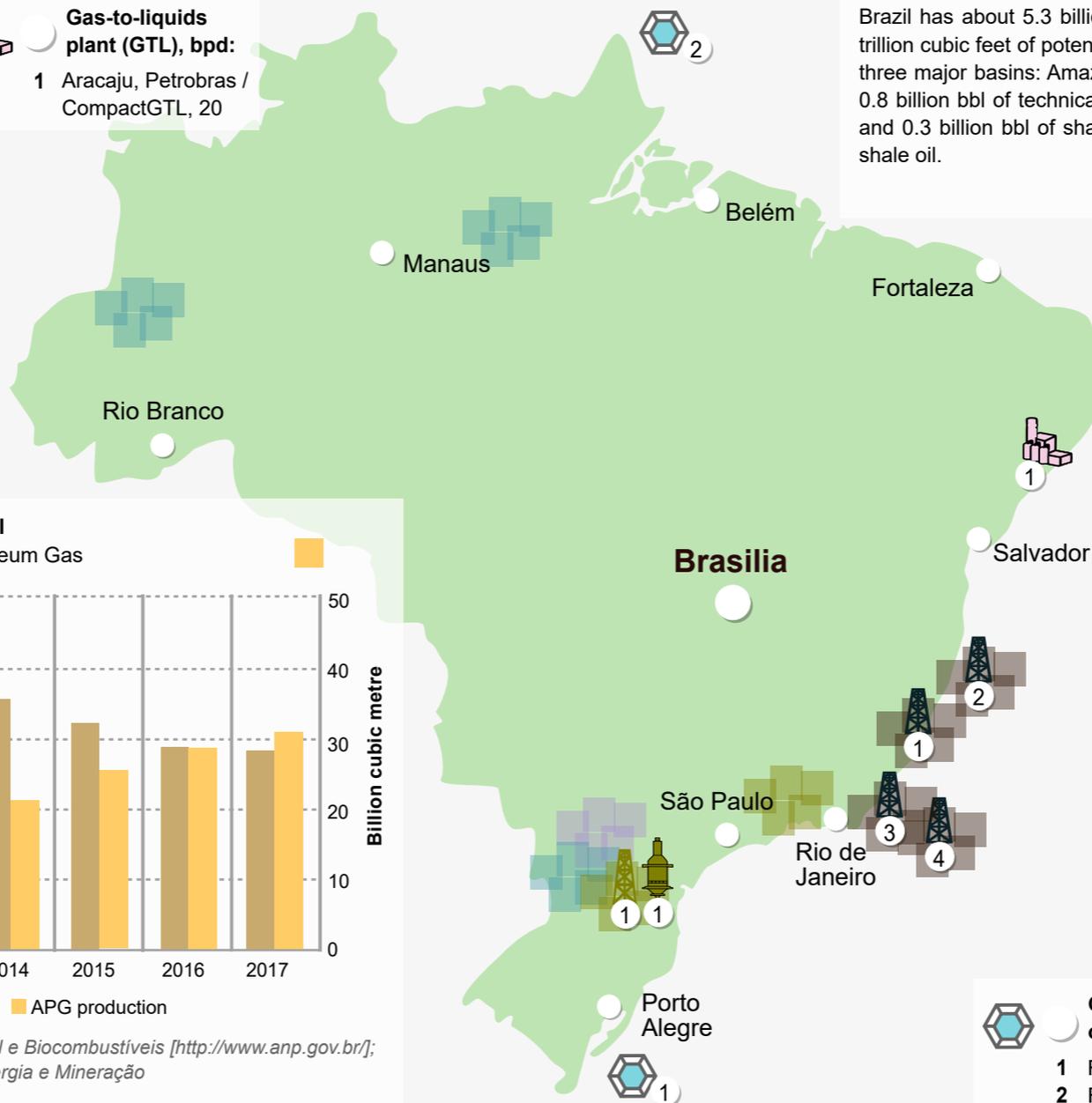


Gas-to-liquids plant (GTL), bpd:

- 1 Aracaju, Petrobras / CompactGTL, 20

Brazil has about 5.3 billion barrels of unproved technically recoverable shale oil and 244.9 trillion cubic feet of potential shale gas resources. Most of Brazil's shale resources located in three major basins: Amazonas basin with 100 Tcf of technically recoverable shale gas and 0.8 billion bbl of technically recoverable shale oil; Solimoes basin with 65 Tcf of shale gas and 0.3 billion bbl of shale oil; Parana basin with 80 Tcf of shale gas and 4.3 billion bbl of shale oil.

Source: U.S. Energy Information Administration (Dec 2021).



Major heavy oil extraction fields, bpd (API):

- 1 Fazenda Alegre, Petrobras, 9500 (13.2)
- 2 Jubarte, Petrobras, 18 000 (19.3)
- 3 Peregrino, Campos Statoil, 100 000 (13.7)
- 4 Albacora-Leste, Petrobras, 180 000 (20.0)

- Largest shale oil (tight light) fields
- Largest shale gas fields
- Largest oil shale (kerogen) fields

- Major oil shale extraction fields:
- 1 Sao Mateus do Sul, Petrobras (Irati Formation)



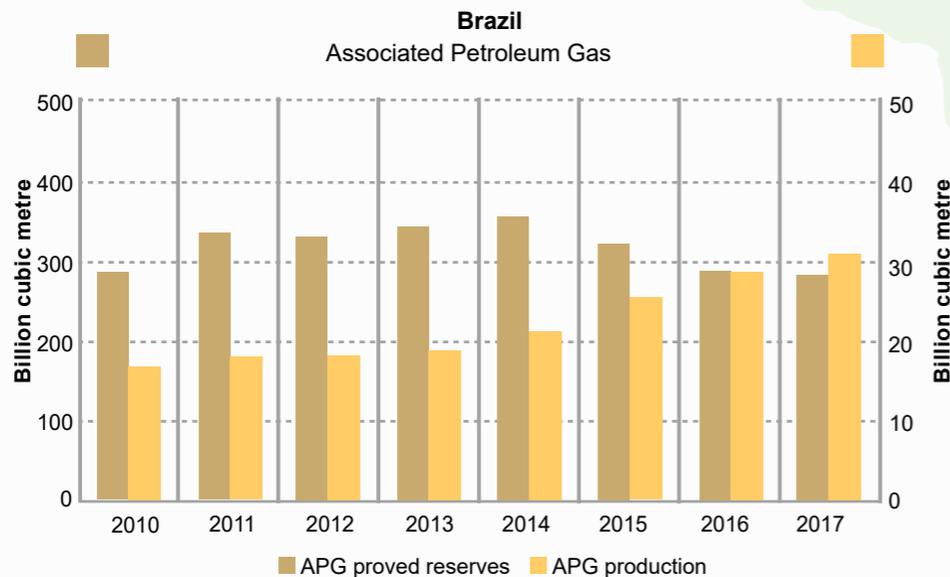
Gas hydrates occurrence:

- 1 Rio Grande Cone
- 2 Foz do Amazonas basin



Vertical oil shale retorting plant, t/d:

- 1 Sao Mateus do Sul, Petrobras, 5880



Sources: Agência Nacional do Petróleo, Gás Natural e Biocombustíveis [<http://www.anp.gov.br/>]; Governo do Estado de São Paulo Secretaria de Energia e Mineração [<http://www.energia.sp.gov.br/>].

