THE O&G SECTOR IN BRAZIL

cippe

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anp

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Brazil at a glance

Brazil plays a relevant role in the Global O&G Industry

The largest economy in Latin America

Among the largest economies in the world
(Rank 12th in 2022
1,92 trillion USD –
Austin Rating)

3rd largest recipient of Foreign Direct Investment in 2022
(85 billion USD – OCDE)

9th
Largest **Crude Oil and Condensate** producer
(BP Statistical Review 2022)

8th
Largest **Oil Products Consumer**
(BP Statistical Review 2022)

4th Largest automotive fuel market in the World

A domestic market of over **214** million inhabitants

Among the 10 largest crude oil exporters in the world

9th
Largest **Refinery Capacity**
(BP Statistical Review 2022)
But still need to import diesel, gasoline, jet fuel and LPG

10th
In **sales of petrochemicals** worldwide
(Statista - 2021)

Brazil in the energy transition

A country of plenty and diverse energy resources and one of the world's leading player in the energy transition

Brazil's electricity matrix is one of the cleanest in the world

47%

Share of **primary energy from renewable sources, 2022**
World Average – 14%
(MME)

4th

Largest **share of primary energy from renewables**
1st – Iceland, 2nd Norway, 3rd Sweden
(Our World in Data)

87%

Share of **electricity production from renewables, 2022**
World Average – 28%
(MME)

2nd

Largest Producer and Consumer of **Biofuels**
(BP Statistical Review 2022)

3rd

Largest **Hydropower** generation in 2021
(Our World in Data)

6th

Largest **Wind Generation Capacity**
(GWEC 2021)

Less than **10** kgCO2e/boe is the **carbon intensity in the pre-salt**

14 kgCO2e/boe is the offshore average in Brazil

Compared to OGCI average – 19 kgCO2e/boe

About ANP

ANP is the **regulatory body** for the oil, natural gas and biofuels industry in Brazil

Regulate

Establish the regulation of the oil, natural gas and biofuels industry. ANP must assure **free competition**, **national supply, and consumers protection** in terms of price, quality and product offer.

Contract

Grant **authorizations** for the O&G and biofuels activities; to promote **E&P bidding rounds** and **sign contracts** on behalf of the Federal Estate.

Inspect

Enforce the standards and rules by the regulated industry. It covers the administrative process, judgment and sanction.

ANP is responsible for **implementing the energy public policies**, but also **subsidizes**, technically, the **National Energy Policy Council**

An industry of approximately 135 thousand regulated agents

ANP regulates from the well to the retail

Upstream	Midstream & NG	Downstream		
E&P	Storage & Transport	Refining/Imports	Distribution	Retail

Upstream

83
economic groups
(45 nationals, 38 foreigners)

Midstream & NG

5
NG Pipeline Operators

2
Pipeline Operators for oil and liquid products

70
Liquid Terminal Operators

4
LNG Terminal Operators

45
LNG/NG Importers

Downstream

9
Refining Operators

3
NGPP Operators

269
Ethanol producer companies

49
Biodiesel producer companies

6
Biomethane producer companies

132.806
Retailers and Regulated Consumers

286
Fuel distributors

858
Importers and exporters

160
Lubricant Producers and Re-refiners

The opening in the O&G Sector

A first step was done in the NG market and downstream

E&P

Companies other than Petrobras are responsible for

34%
total O&G Production (fev/23)

Operators other than Petrobras operates...

62%
of the fields

85%
of the exploratory blocks

Downstream

Companies other than Petrobras are responsible for

20%
of the refining capacity

46%
of the fuels imports (2022)

100%
of the fuel distribution and retail

Gas

Companies other than Petrobras are responsible for

17%
Gas Commercialization Market
(sales to gas distribution companies and final consumers – 2022)

3 of 5
Gas pipeline Operators without Petrobras participation

100%
Gas Distributors

#1

Exploration & Production Overview

Brazil is taking a leading role in the E&P sector

Nowadays

Production:

3.3
Million bpd of **oil** production (Feb 2023)

146
Million m³/d of **gas** production (Feb 2023)

Reserves:

14.9B
Bbl in proved **oil** reserves (Dec 2022)

406B
m^3 in proved **gas** reserves (Dec 2022)

90B
USD **investments** forecast (2023-2027)

1.34
Million bpd of crude **oil export** (2022)

Forecast

2025

Potential to reach a production of more than

4
Million bpd of **oil**

195
Million m^3 of **gas**

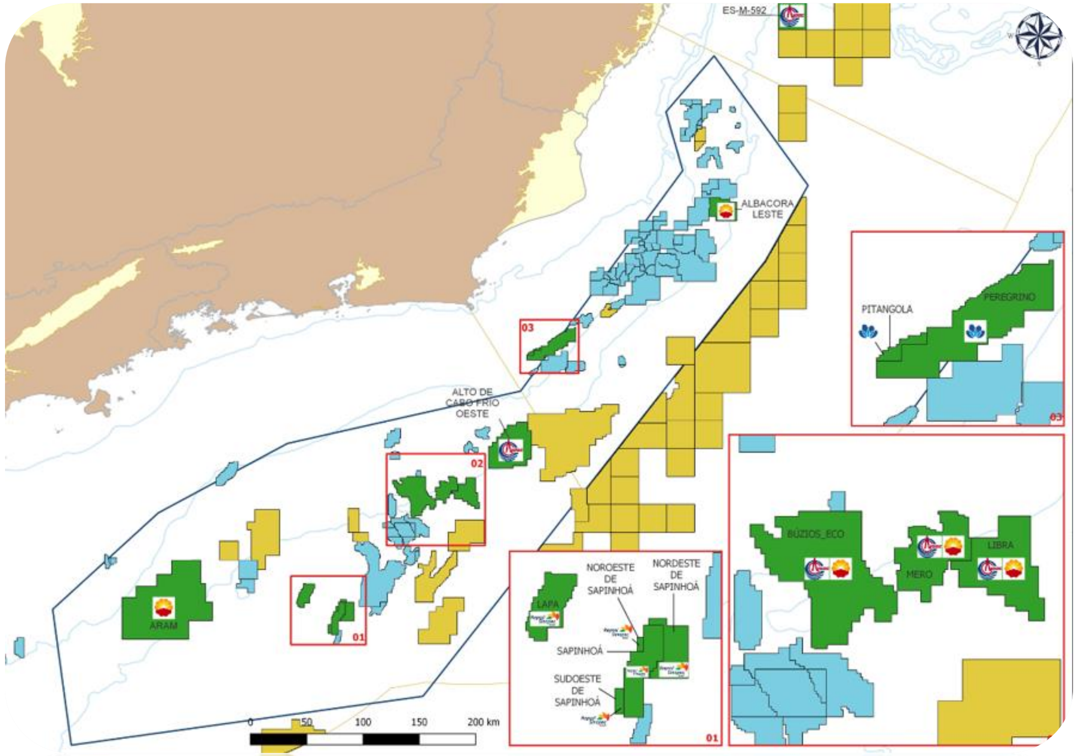
The Chinese companies in the Brazilian E&P Sector

A relevant, valorous and important participation in the Brazilian O&G Industry

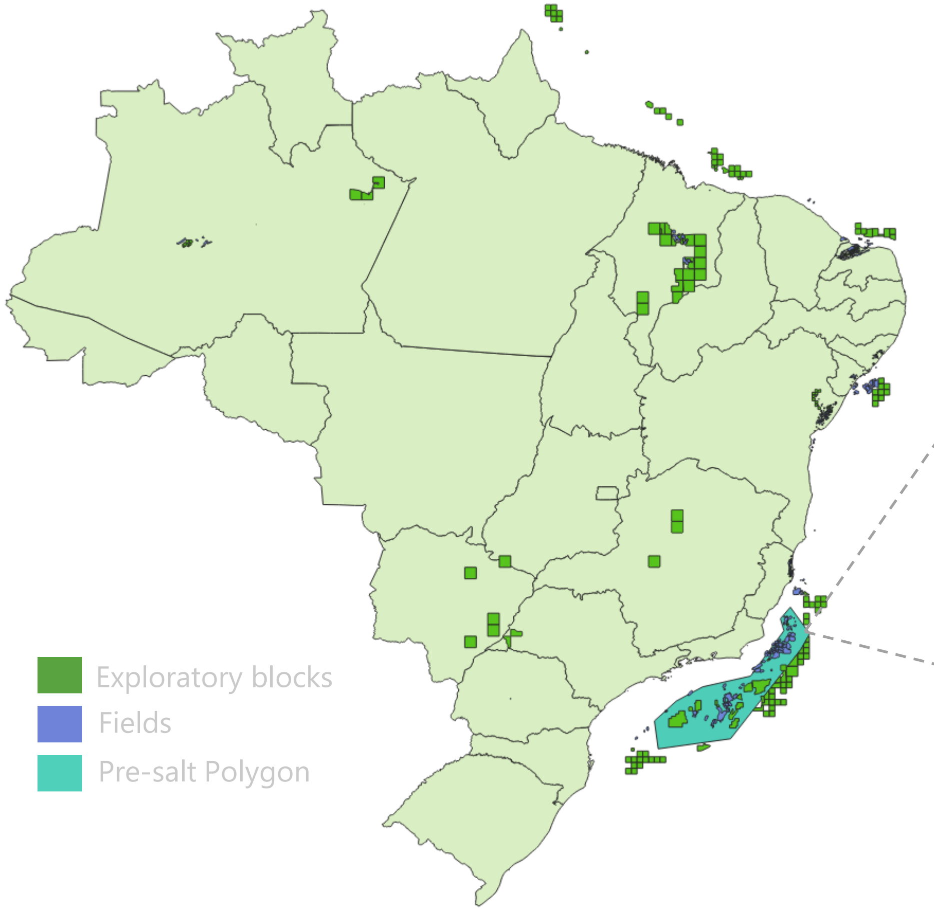
O&G Production in Brazil

Ranking Producers	Company	Oil (bpd)	Gas (Thousand m^3/d)	BOE/d
5^{th}	CNOOC	67.033	3.397	88.402
6^{th}	Repsol Sinopec	56.764	2.637	73.352
8^{th}	CNODC	44.669	2.421	59.895
20^{th}	Sinochem	9.457	21	9.587
Total		**177.923**	**8.476**	**231.236**

Fields/Exploratory with Chinese companies participation



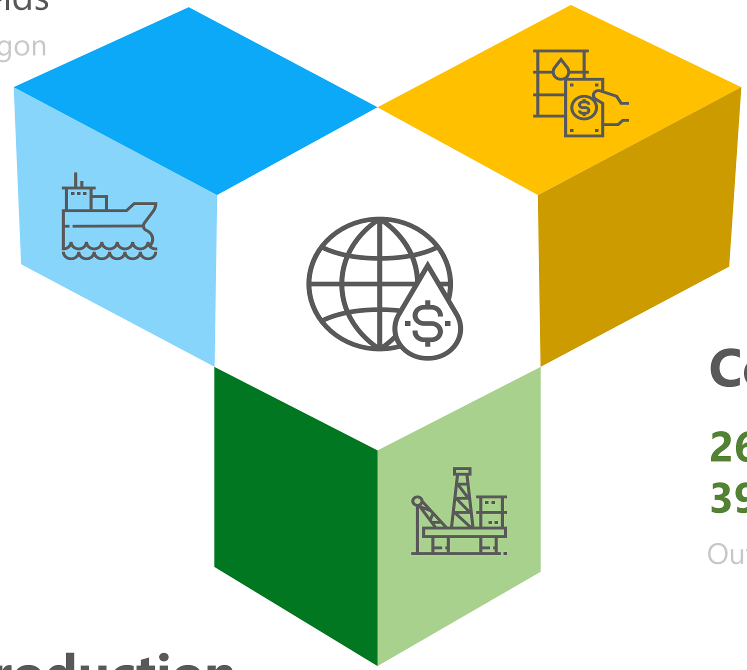
Types of Contracts



Transfer of Rights

10 fields

Inside the pre-salt polygon



Concession

265 exploratory blocks
399 fields

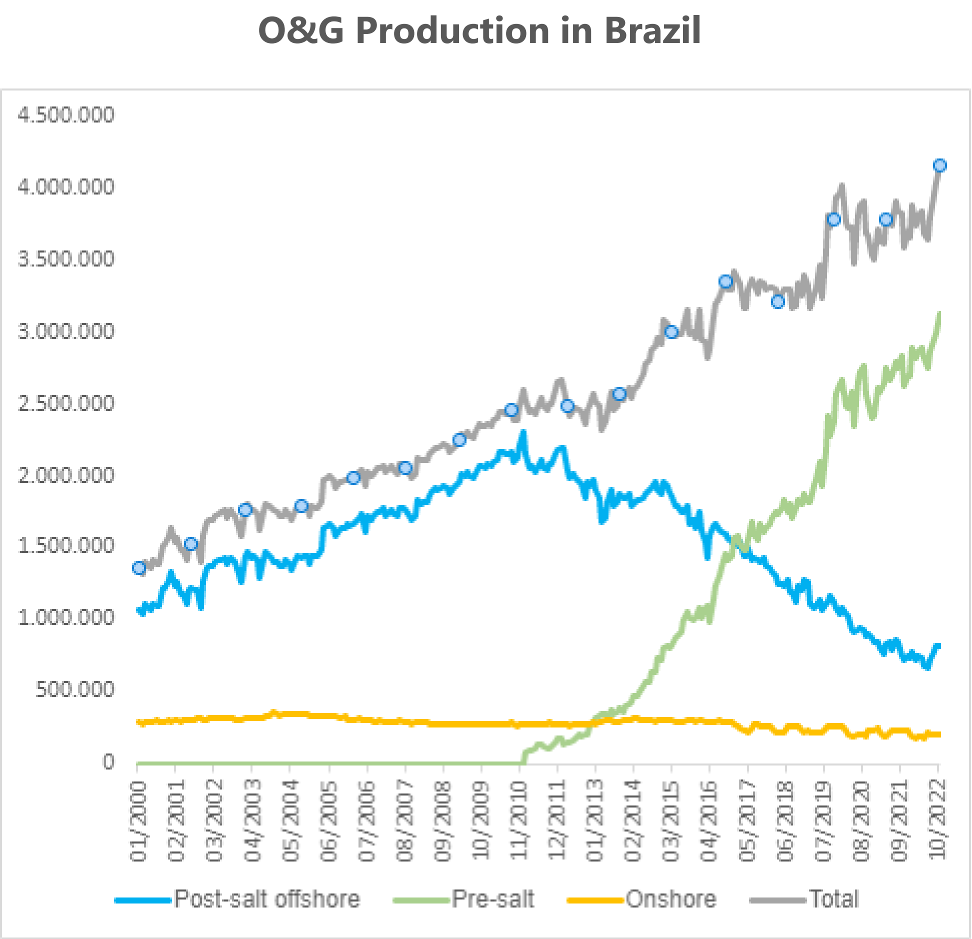
Outside the pre-salt polygon

Production Sharing Agreement

10 exploratory blocks (+4 to be signed soon)
10 fields

Inside the pre-salt polygon

Three different E&P environment



Pre-salt

Home to the largest offshore oil discoveries in the last decade

78%

of total O&G production

136 wells in production

Post-Salt Offshore

All the offshore area besides the pre-salt region, including new frontier areas and a significant number of large mature fields

17%

of total O&G production

371 wells in production

Onshore

Mature fields and New Frontier Basins (mostly gas prone)

5%

of total O&G production

4,915 wells in production

Brazil is poised to be one of the key sources of growth over the medium term

BRAZIL is home for the MAJORITY of FPSOs projects under development

20 new production units to start operation from 2023 to 2027

2023	2024	2025	2026	2027
Marlim 1	Búzios 7	Búzios 6	Búzios 9	Albacora
Marlim 2 ✓	Mero 3	Mero 4	Búzios 10	Búzios 11
Mero 2	IPB – Parque das Baleias	Búzios 8		SEAP 1
Búzios 5	Atlanta FDS			SEAP 2
FSO Pargo	Bacalhau			BM-C-33

**Non-Petrobras Operator*

Mandatory RD&I Investments

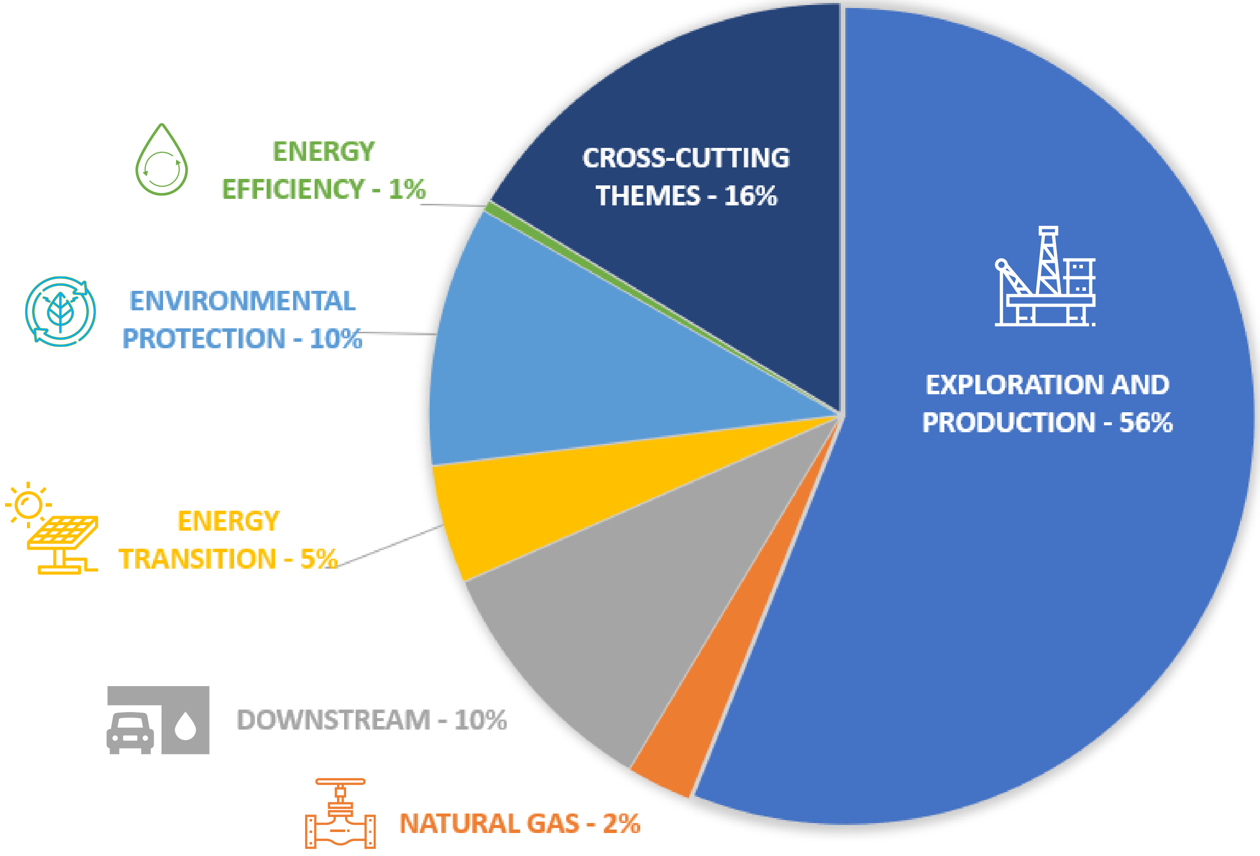
Contractual obligation to invest in research, development and innovation (RD&I) in Brazil

RD&I Expenditure (2018–2022): US$ **2.5 billion**

R&D Trends:

Artificial Intelligence
Machine Learning
Digital Transformation
Smart Completion
CO2 Capture
Renewables
Environmental Protection

Project Portfolio Overview (2018 – 2022)



E&P strategic goals

RIGHT ASSETS IN THE RIGHT HANDS

INCREASE THE RECOVERY FACTOR

INCREASE EXPLORATORY ACTIVITIES

MAKE MARGINAL DISCOVERIES VIABLE

We need to keep increasing **above ground competitiveness** in order to achieve our main goals

Many measures have already been taken to encourage E&P activities

2018

Local Content waivers
(ANP Resolution n° 726/2018)

Royalty reduction on the incremental production
(ANP Resolution n° 749/2018)

Reserve Based Lending
(ANP Resolution n° 785/2019)

Mandatory investment or M&A in onshore and shallow water fields; deadline for Petrobras divestment
(RD n° 568/2018)

2019

A new type of auction:
Open Acreage

Unlocking the **Transfer of Rights Auction**

2020

ANP Resolutions:
Flexibility as a result of the pandemic

2021

Royalties' reduction for S&M companies
(ANP Resolution n° 853/2021)

Adjustment Agreement to Local Content
(ANP Resolution n° 848/2021)

Area Nomination
(ANP Resolution 837/2021)

Decommissioning Guarantees
(ANP Resolution n° 854/2021)

All onshore data for free

2022

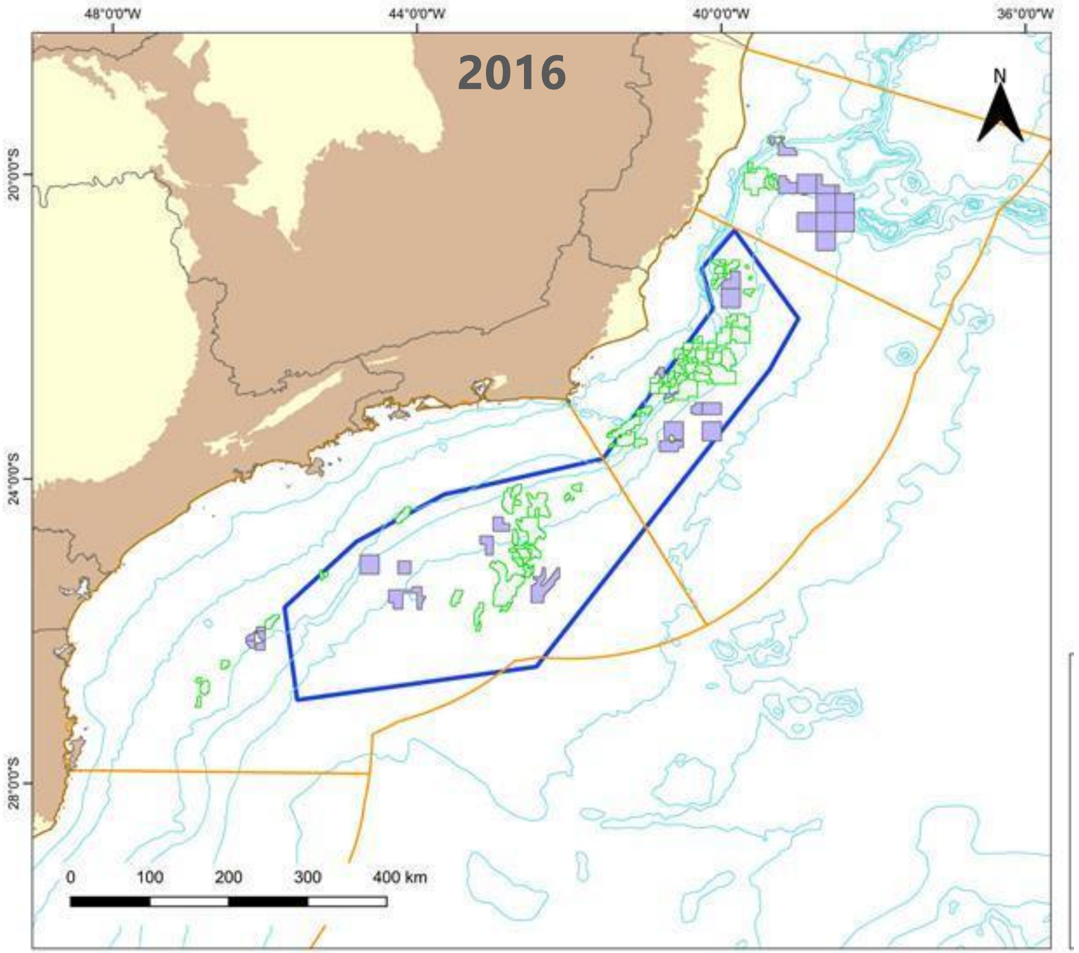
Marginal Fields Definition
(ANP Resolution n°877/2022)

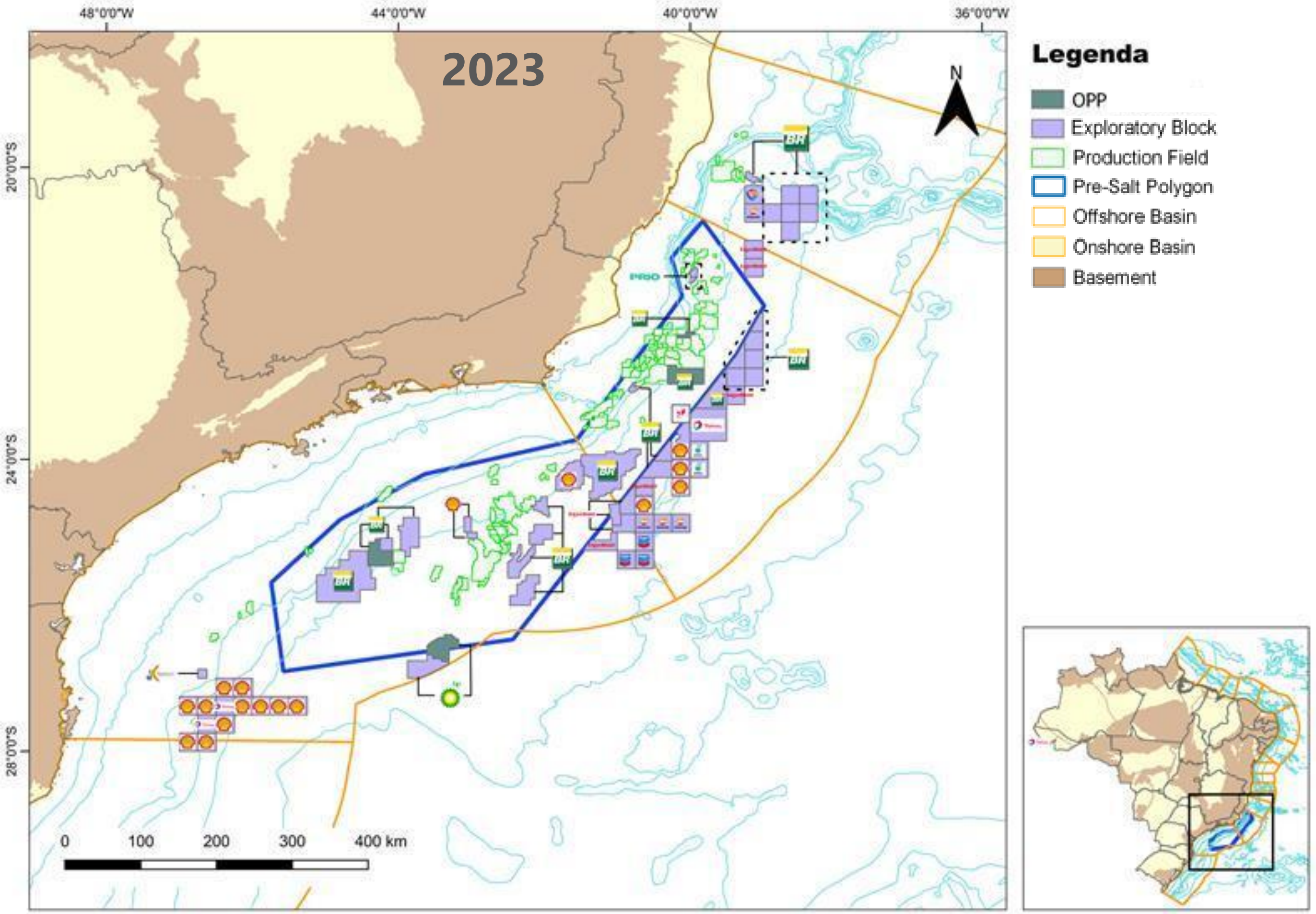
Well Offshore data for free

Extension of the Exploration Phase for 18 months
(ANP Resolution n° 878/2022)

Bid Rounds
R$ 124.5 B in signature bonuses (2017/2022)

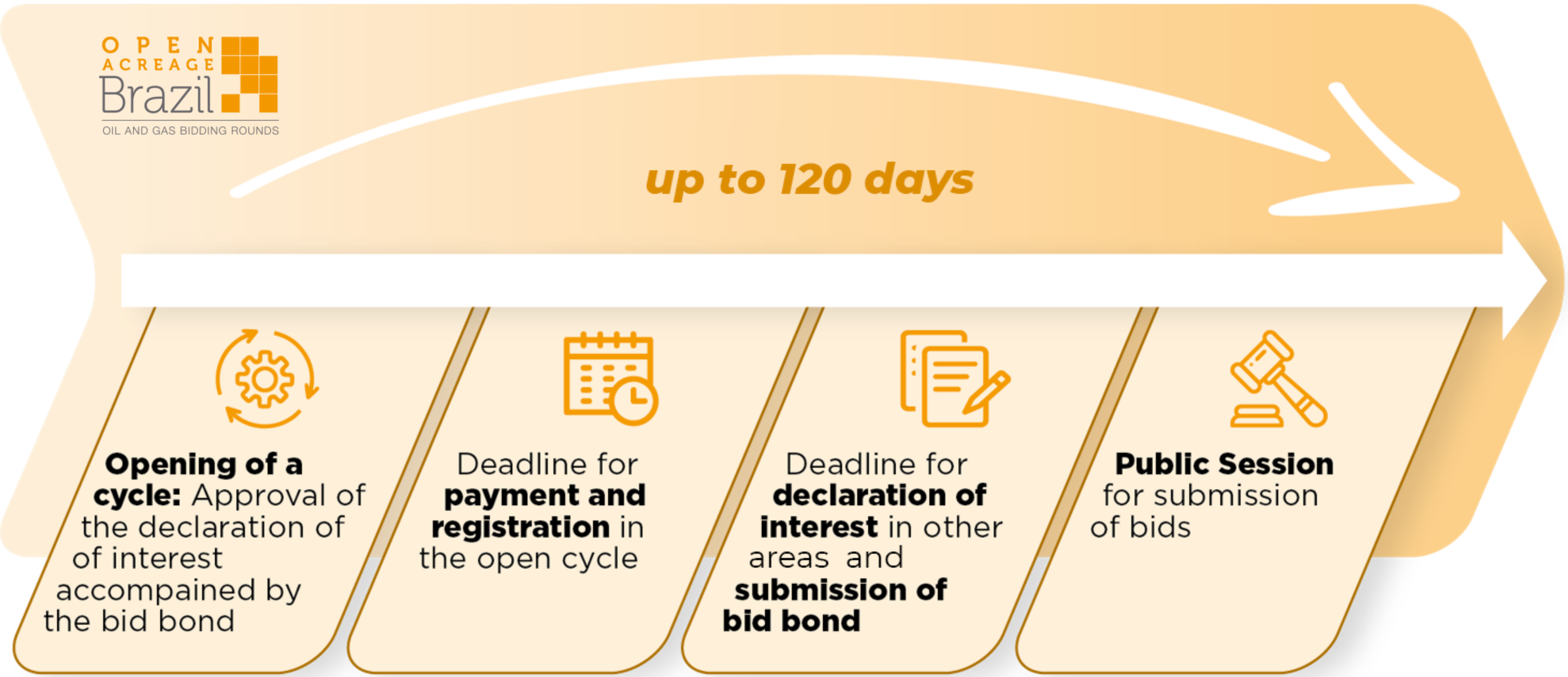
Results from 2017 bidding rounds in Campos and Santos basins





Opportunities in the Open Acreage

The Open Acreage allows the market to decide when bidding rounds will take place and what areas from the stock will be offered.



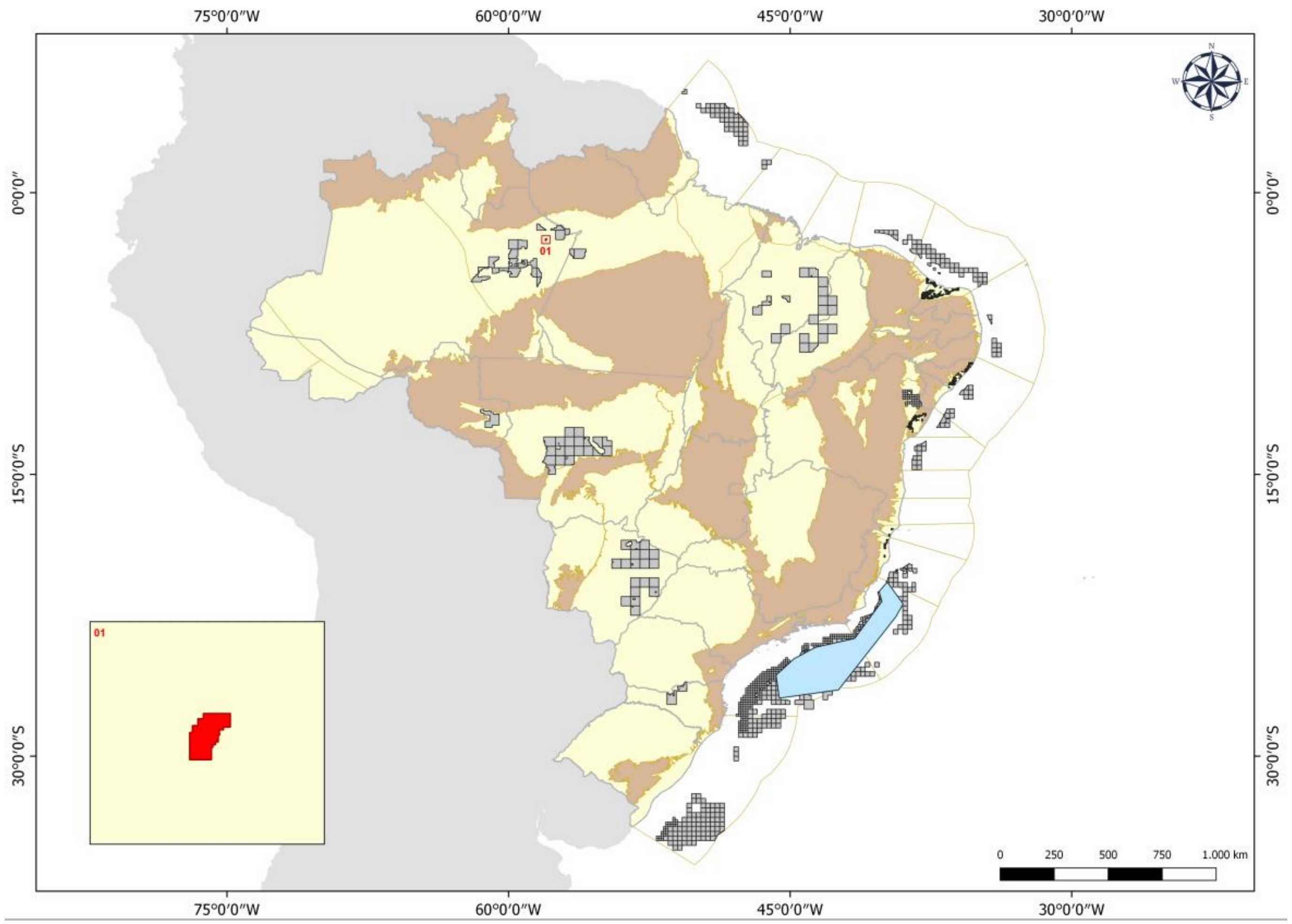
The schedules of the Open Acreage cycles will begin with the approval of a declaration of interest submitted by a registered bidder accompanied by a bid guarantee.

Open Acreage Concession

Blocks On **Offer**

Today:

1,009
Blocks



Blocks on offer

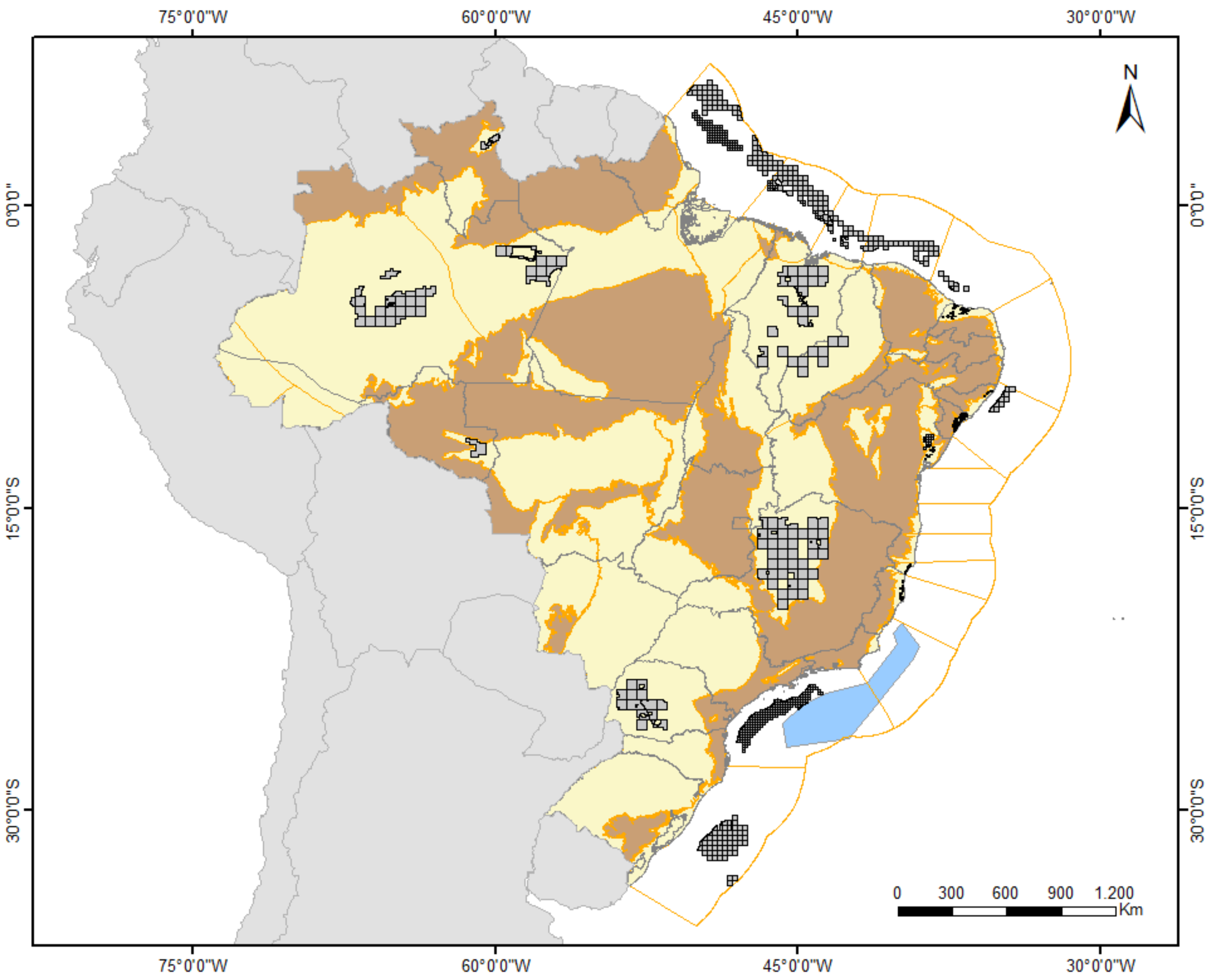
Soon:

1,098
Blocks

+Japiim Field
(green marginal gas field)

Open Acreage Concession

Blocks Under **Study to be added in the future**



Blocks under study

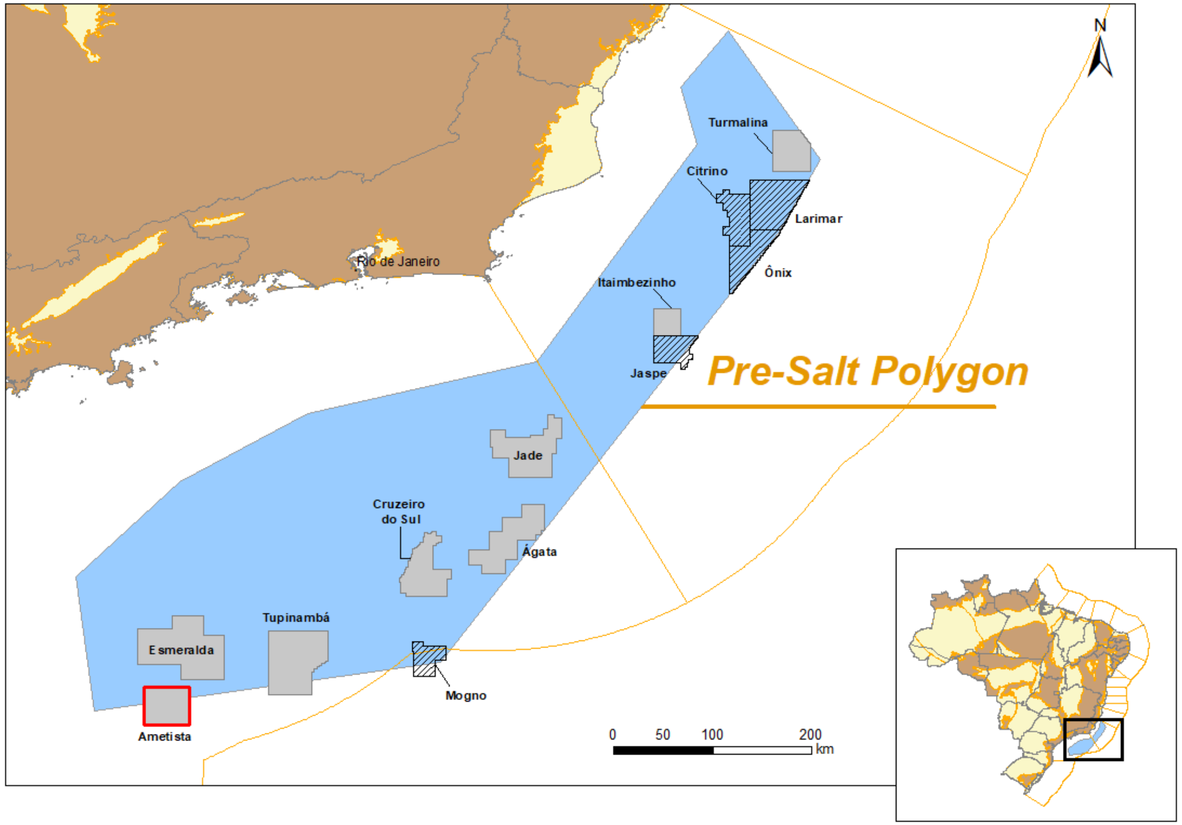
Under Study:

+800
Blocks

Open Acreage PSA (inside pre-salt polygon)

Areas in **Stock**

7
Areas



Areas in Stock

\+ **Ametista**
to be included soon

\+ **5 new areas**
already submitted to the Ministry of Mines and Energy to be approved by the Energy Council (CNPE)

56B
estimated oil equivalent in place

or 14B risked in place O&G volume
(all 13 areas)

#3

Natural Gas Market

The natural gas production

Natural gas production in Brazil is mainly associated with oil produced in offshore fields
Only less than 40% of the national production is monetized and consumed by the Brazilian market due to lack of demand/infrastructure and high gas prices.
In addition, the national gas production has the potential to double by 2030, and all efforts are being done to monetize it.

Gas Production

GAS

*Feb 2023

146 Million m³/d

Gas Reinjected

53%

78.7 Mm³/d

Gas Flaring

2.6%

3.8 Mm³/d

Gas Exported to the market

34%

49.4 Mm³/d

Gas Consumed in facilities

10.4%

15.15 Mm³/d

Natural gas has a lot of potential in the Brazilian energy matrix (**10.5%** is the stake nowadays)

The natural gas market

The natural gas market is supplied by national gas production, imports through pipelines from Bolivia and LNG imports through regasification terminals

SUPPLY

*2022

72 Million m³/d

National Production — 66%

Bolivia Imports — 24%

LNG Imports — 10%

DEMAND

*2022

68 Million m³/d

Industrial — 61%

Electric Generation — 22%

Automotive — 9%

Others — 8%

The natural gas infrastructure

Current infrastructure is limited for such a large country

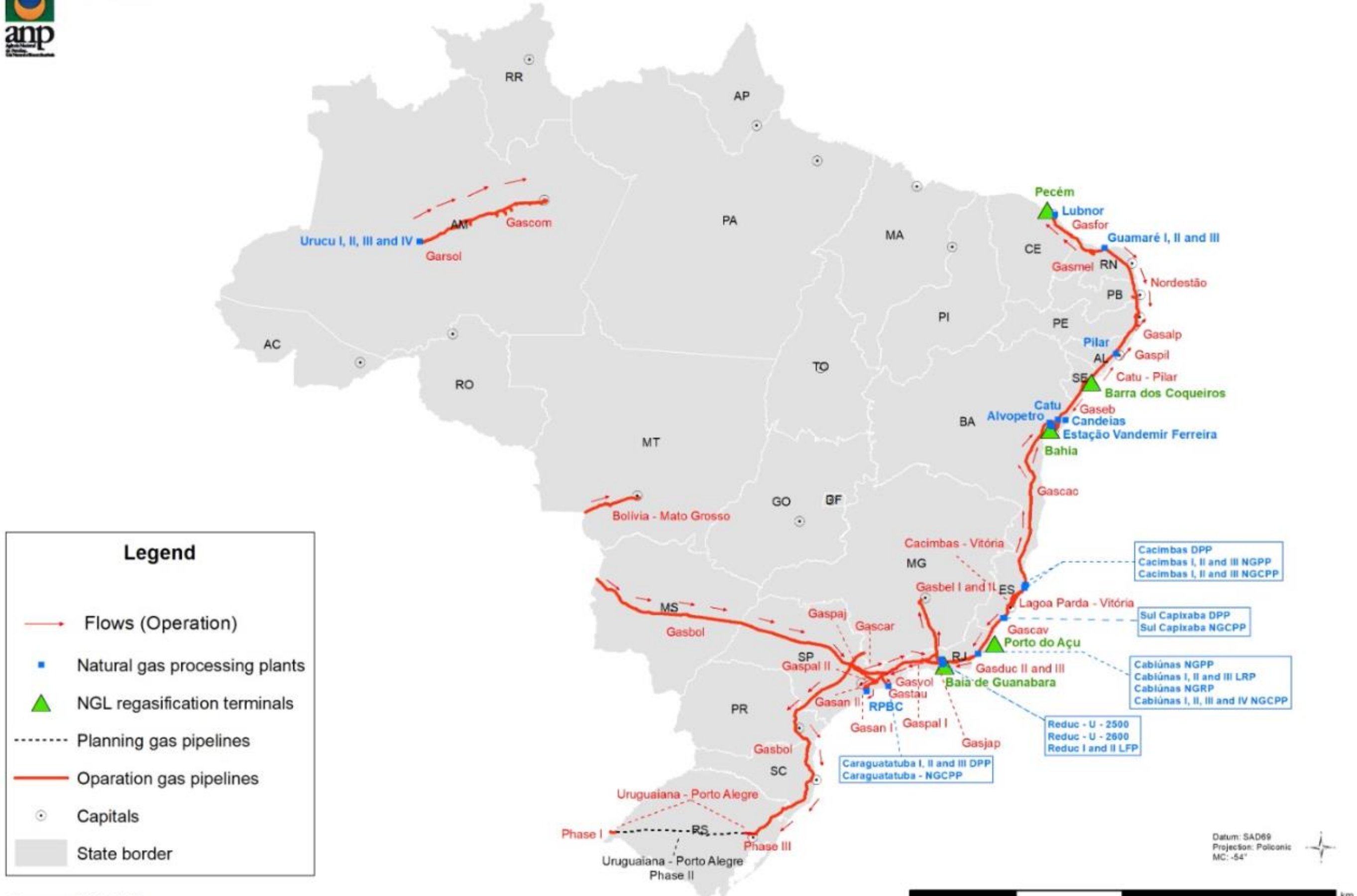
9,306
km of transmission gas pipelines

2,257
km of transfer gas pipelines

13
NG processing plants
Capacity: **102** Million m³/d
+49 Million m³/d under construction

5
LNG Terminals
Capacity: **99** Million m³/d
+ 50% under construction (3 new terminals)

Map 1.3 - Infrastructure for natural gas production and transportation - 2021



Source: ANP/SIM.

Source: ANP Statistical Yearbook (2022)

Brazil is moving towards a competitive gas market

After new gas law, access to transport has been effective and enabled the entry of new suppliers in the commercialization market
New transport contracts were signed between independent producers, natural gas distributors/free consumers and transporters

2021

New Gas Law
Law 14,134
Decree 10,712

- Petrobras´ market-share in gas sales*: **99%**

Past: a verticalized market

2022

- **203** contracts signed by **20 different shippers** able to transport gas in Brazil.
- Petrobras´market share in gas sales*: **81,5%**
- Average prices from other producers than Petrobras is **16.5% lower** than those charged by Petrobras

Present: a market with third-party access

2023 (March)

- Petrobras´ market share in gas sales*: **77%**
- **72** contracts signed by **18** shippers
- **78%** of gas sales in the Northeast were made by independent producers

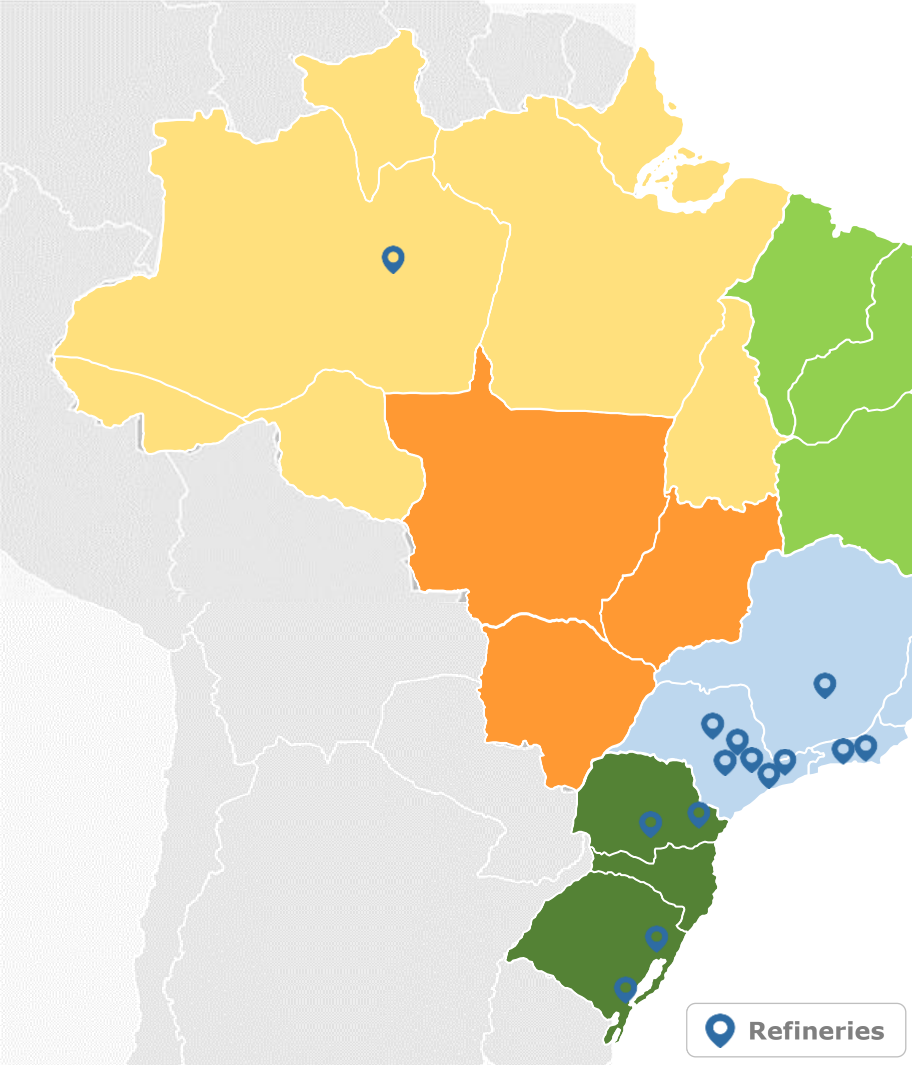
The number of authorizations granted for the **import and sale of natural gas** has multiplied, currently reaching **66** and **182** authorizations respectively.

* Non-thermal Petrobras market share in the integrated gas pipeline system

#4

Downstream market

The downstream market



143

Million m³ of fuels sold in the market in 2022

19

Refineries

Utilization Factor in 2022:
74,5% - 84,8%

2.4

Million bpd
Refining Capacity

9 Companies:

acelen
UNIVEN
FORBES & MANHATTAN
DAX OIL
BR PETROBRAS
REFINARIA DE PETRÓLEO RIOGRANDENSE
atem
Refit
SSO SSOil Energy

Main fuel sales in 2022:

63

Million m³ of Diesel (10% of biodiesel)

43

Million m³ of Gasoline (27% of ethanol)

15

Million m³ of Ethanol

13

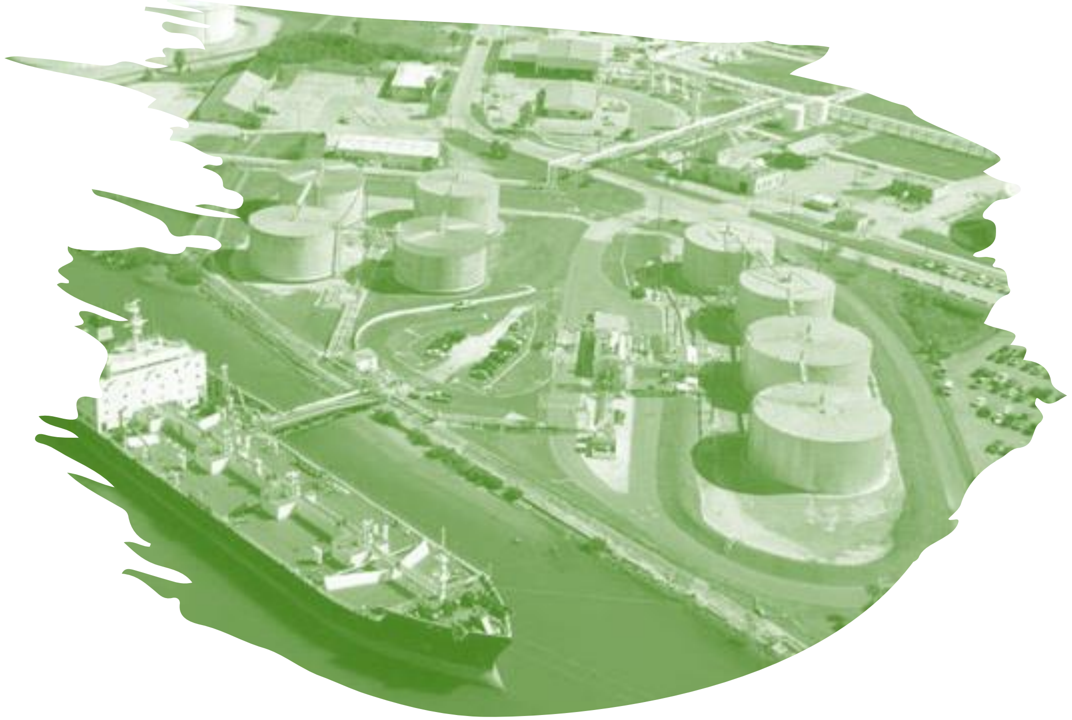
Million m³ of LPG

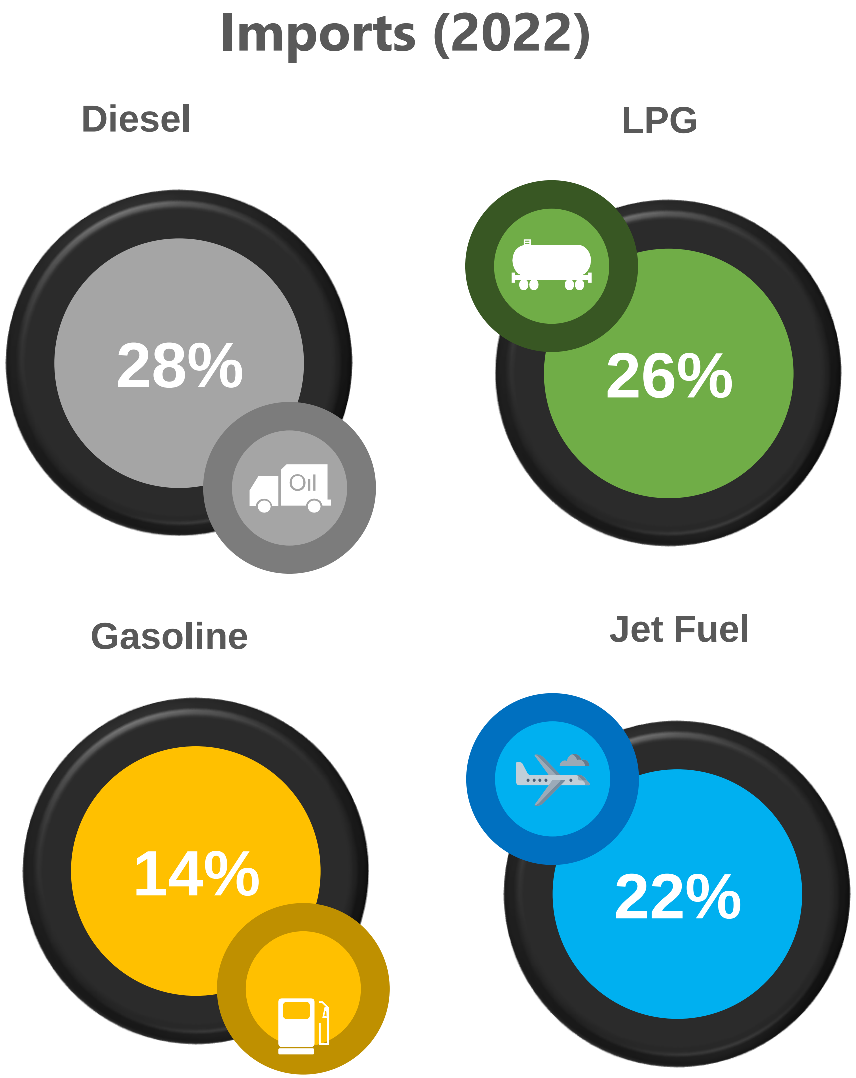
6

Million m³ of Jet Fuel

Brazil still needs a lot of fuel imports

We export crude oil and import oil products, creating opportunities in the refining market
In 2022, we imported 25 million m³ of fuel (gasoline, LPG, diesel and jet fuel)





As a continental sized country, we also need more **storage capacity and pipelines extension** in order to develop the market and **enhance competition**

The biofuels market

Brazil has large experience in producing biofuels and is already a global leader in the use of biofuels.
The biofuels market is a result of longstanding public policies. Nowadays, gasoline sold in Brazil has 27% of ethanol and diesel has 12% of biodiesel.
In 2021, the biofuels represented around 24% of the Brazilian vehicle mix.

Ethanol

358
Ethanol Mills

394k
m^3/d of capacity
(+ 5% increase under construction)

31M
m^3 of ethanol production
(2022)

Biodiesel

59
Biodiesel Plants

38k
m^3/d of capacity
(+ 24% under construction)

6M
m^3 of biodiesel production
(2022)

Biomethane

6
Biomethane installations

417k
m^3/d of capacity
(+ 92% under construction)

58M
m^3 of biomethane production
(2022)

#5

Final Remarks

Brazil is a country of great opportunities

Our Strengths

Sanctity of Contract

Geological potential

Pre-salt: world-class assets with low carbon intensity

IOR opportunities in mature fields

Market Opening in the midstream (New Gas Law) and downstream

One of the largest fuel market

Great Potential for renewables and biofuels

National Agency of Petroleum, Natural Gas and Biofuels

Official ANP profiles on social midia

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