

The E&P sector in Brazil



AAPG




Advancing the World of Petroleum Geosciences™

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An unprecedented transformation

We continue to make progress in opening the O&G sector

E&P



A completely **diverse sector** will emerge from Petrobras Divestment Plan. All onshore and shallow water fields are being sold, as well as some great offshore post-salt concessions.

With new investments in mature fields, development of pre-salt fields, offshore blocks in the exploratory phase, and a calendar of new auctions, Brazil is ready to grow production and take a leading position in the sector.

Downstream



Half of the Brazilian refining capacity (REFAP • RNEST • REPAR • RLAM • LUBNOR • REGAP • REMAN • SIX) is being sold by Petrobras, paving the way for a **competitive and open refining** and fuel market for the first time ever.

ANP is taking measures to deal with the transition to this new environment and to bring competitiveness to the distribution sector.

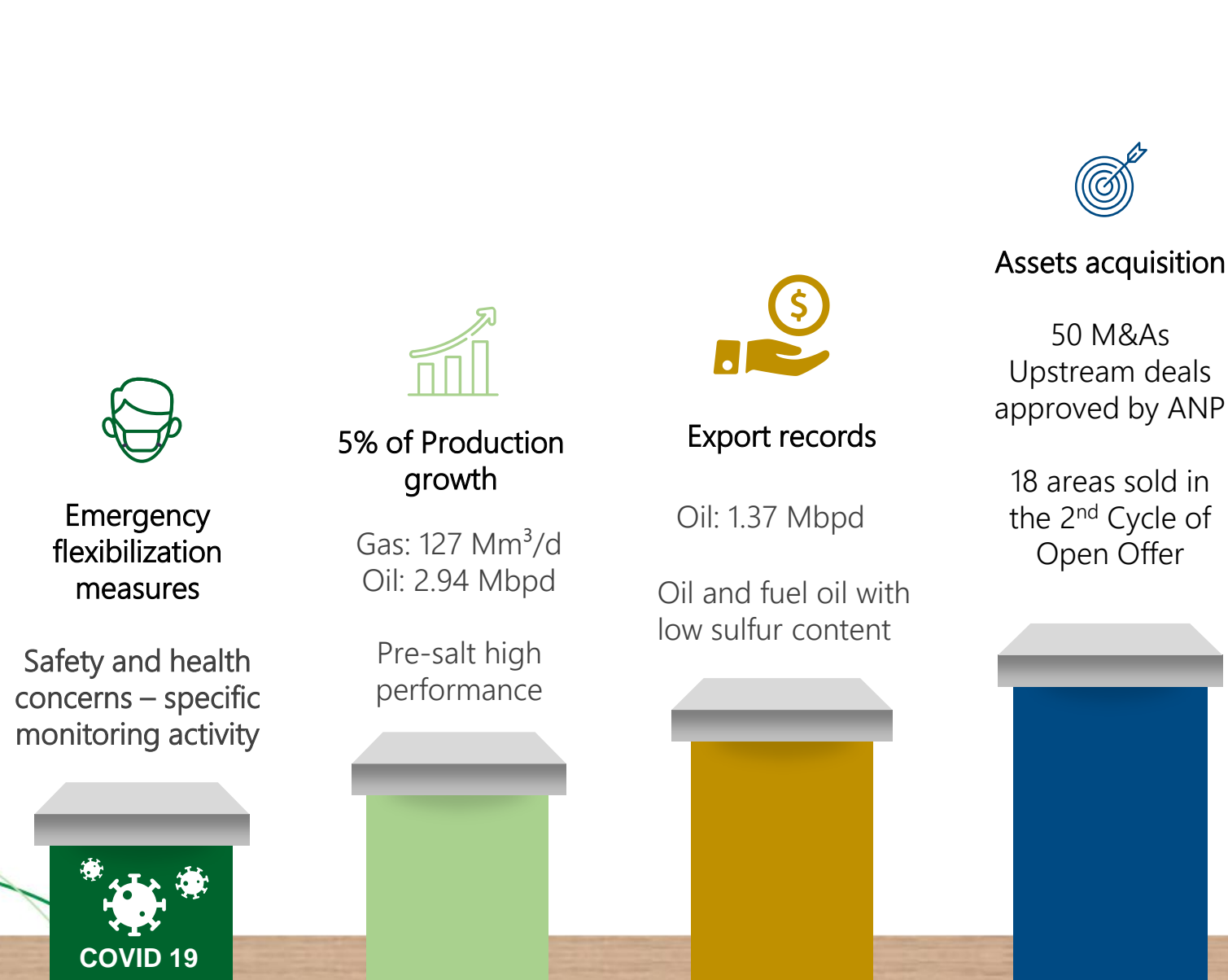
Gas



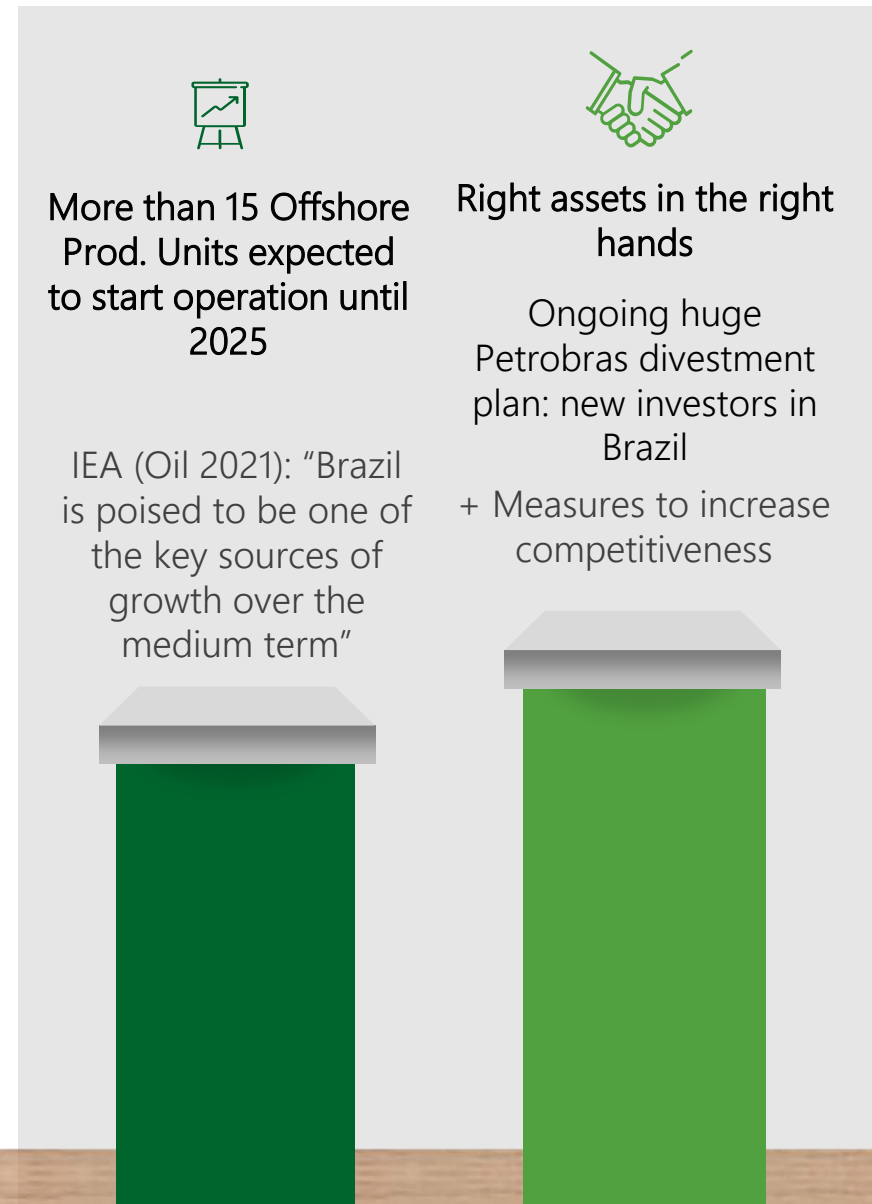
First-ever **effective opening in the natural gas market** with Petrobras leaving the transport and distribution sectors.

A new legal framework has just been put in place for the gas market (Law 14,134/2021 and Decree 10,712/2021) and a strong regulatory agenda is underway to create opportunities for suppliers and free consumers and distributors. An open season calendar is set for this year.

Resilience in 2020 and ready for recovery



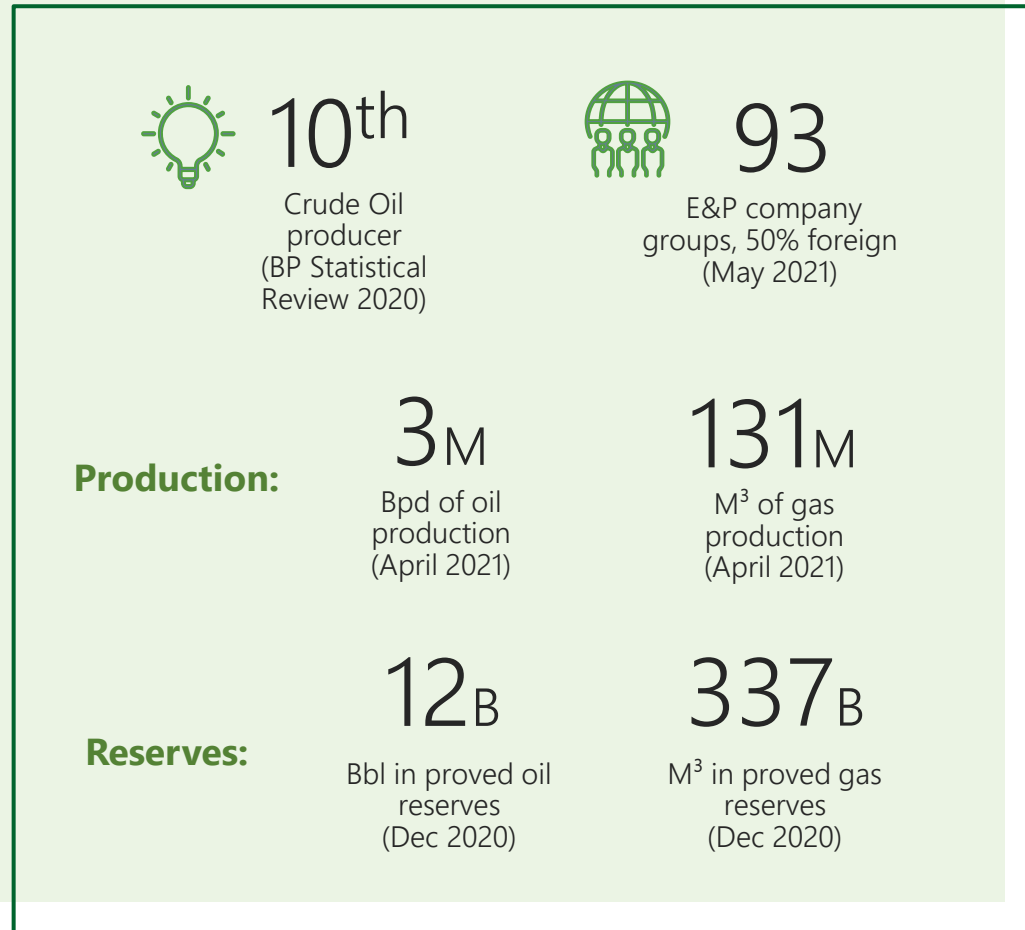
Well positioned for growth



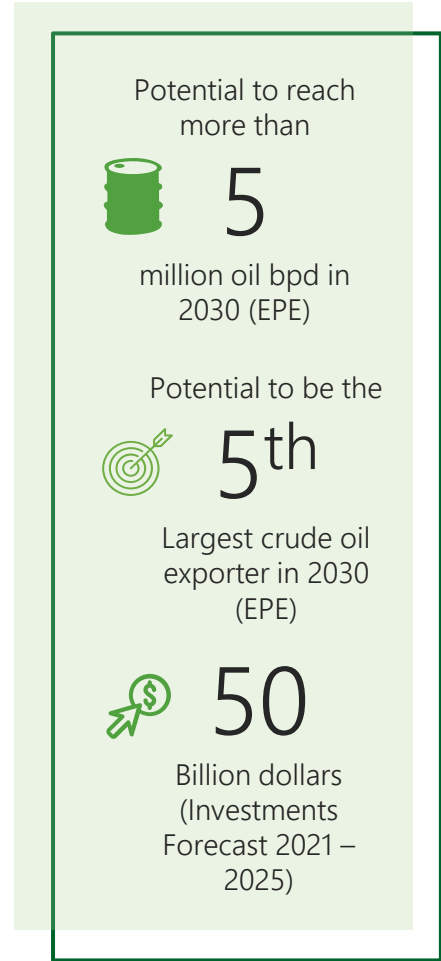
Brazil is taking a leading role in the E&P sector



2021

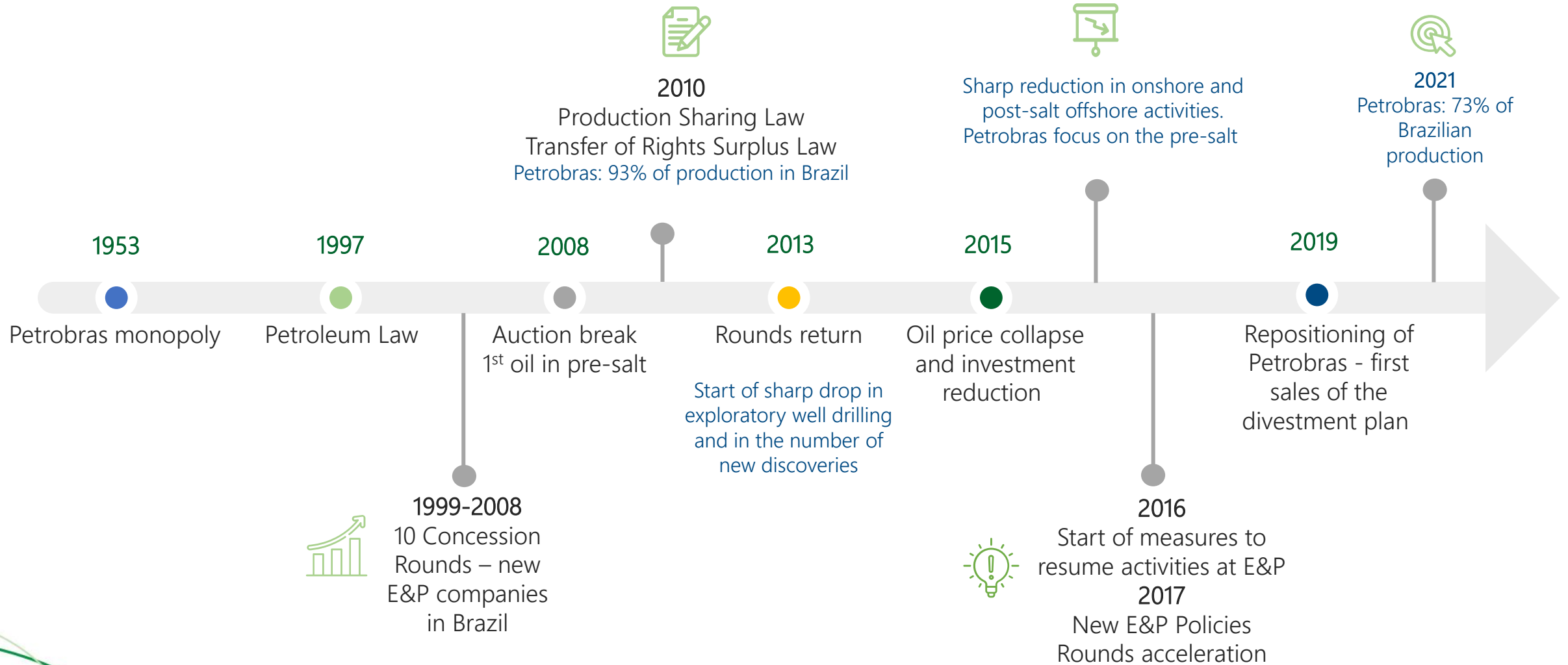


Forecast



E&P history in Brazil

From a monopoly towards an open market



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



2016

No longer mandatory for Petrobras to be the sole operator in the pre-salt (Law 13,365/2016)

2017

A bidding round schedule (CNPE Resolution 10/2017)

New Local Content (CNPE Resolution 10/2017)

New E&P Incentives (CNPE Resolution 10/2017)

Exploratory Phase Extension for 11th and 12th Rounds (ANP Resolution n° 708/2017)

REPETRO Extension (Law 13,586/2017)

2018

Investment

(/2018)

the

(/2018)

RBL and M&A made easier (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

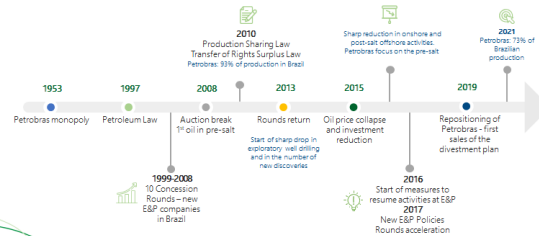
Unlocking the Transfer of Rights Auction

2020

Regulation of decommissioning (ANP Resolution n° 817/2020)

ANP Resolutions: Flexibility as a result of the pandemic

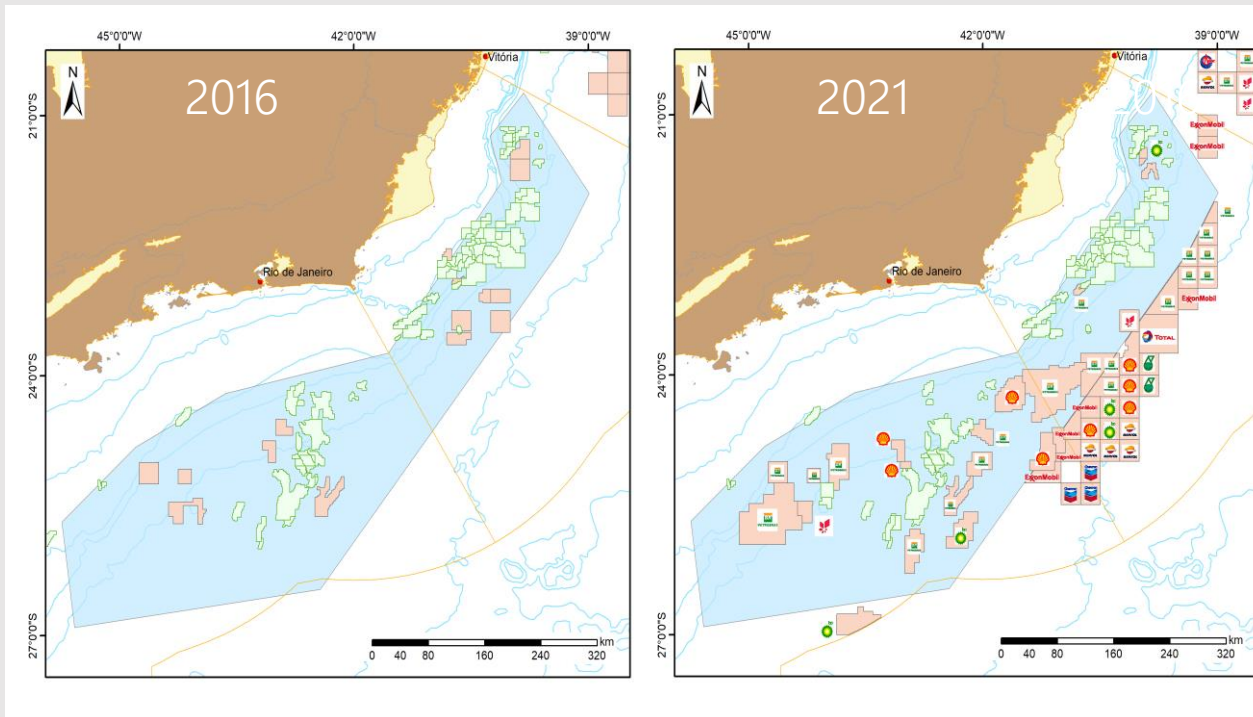
E&P history in Brazil
From a monopoly towards an open market



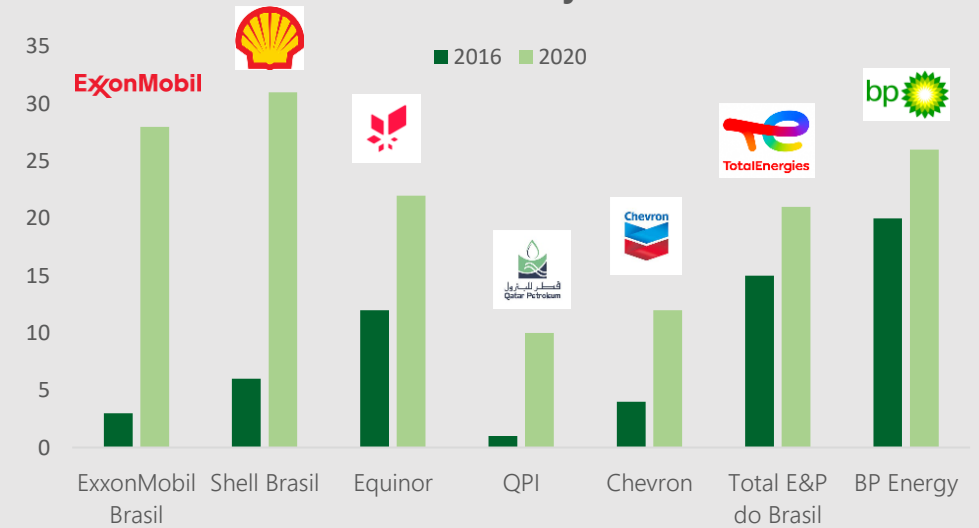
Bidding Rounds (from 2017 to 2020)

And the results came, mainly in the pre-salt area...

That will support E&P activities in the future



Growth in the number of E&P contracts for selected majors



New companies stepping into the offshore:

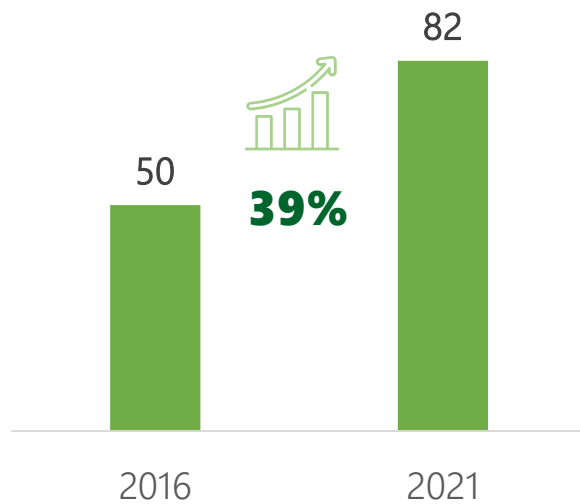


The auctions held since 2017 have awarded 90,000 km² and yielded R\$ 112 billion in signature bonuses

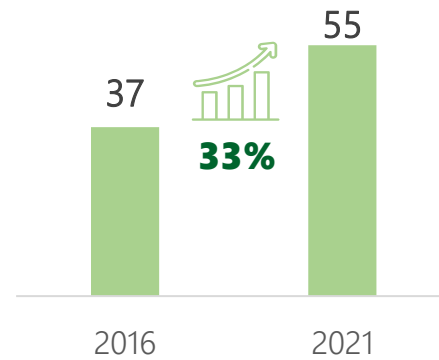
Also, a new onshore market is being set up

A new onshore market with small and medium companies is being established with Petrobras Divestment Plan, supported by foreign and national investors (highlight for 2 IPOs). All onshore fields are being sold by Petrobras – huge investment opportunities in mature fields

Onshore E&P Companies in Brazil



Onshore E&P Corporate Groups in Brazil



Growth in the number of companies operating onshore

Logos included in the circle:

- energizzi (ENERGIAS DO BRASIL)
- PETRO VICTORY ENERGY
- Petro
- petroborn (OLEO E GÁS S.A.)
- NTF (OLEO E GÁS)
- Leros Petróleo & Gás
- EAGLE OIL & GAS CO.
- ENP (ENERGY PLATFORM)
- Newo
- Karavan OIL
- ENERGY paranã
- 3R (Petroleum Redevelopment of oil & gas fields)
- BrasilRefino
- Slim DRILLING
- bgn
- Potiguar E&P

The exploratory environment is increasingly diverse

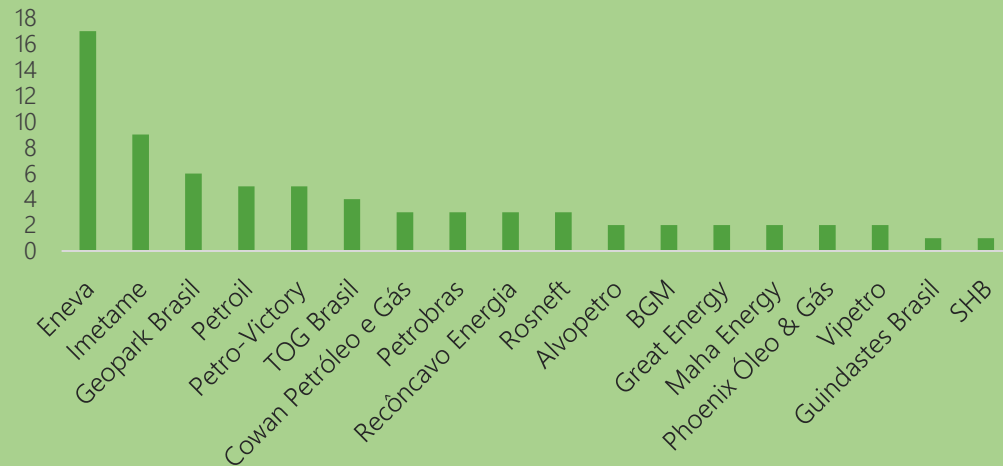
234 exploratory blocks, 70% operated by non-Petrobras companies
 173 thousand km² in exploratory areas: 61% offshore

Onshore



Operator	Exploratory blocks	Active blocks
Petrobras	3	3
Others	87	69
Total	90	72

Onshore active blocks by operator



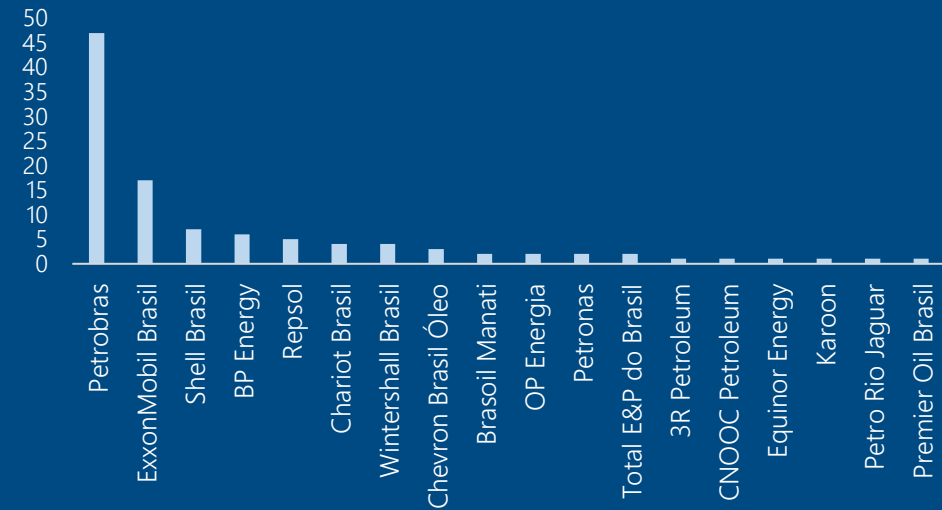
97% of onshore blocks operated by independent companies

Offshore



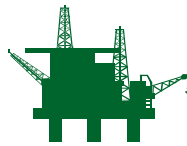
Operator	Exploratory blocks	Active blocks
Petrobras	68	47
Others	76	60
Total	144	107

Offshore active blocks by operator



Natural gas: a big opportunity

Offshore gas potential



Relevant gas potential in the pre-salt. Natural gas production in Brazil should reach 276 million m³/day in 2030 (EPE)

All efforts are being made so that this gas can be monetized

Onshore gas potential



4 paleozoic basins with potential for natural gas: Parnaíba, Solimões, Amazonas, Paraná basins

Most of the onshore exploration in new frontier basins is to produce gas. Relevant reservoir-to-wire projects in Parnaíba and Amazonas Basins

New gas market



The new Gas Law (Law 14,134 / 2021) is a decisive step towards an open, liquid and competitive market

A robust regulatory agenda is underway to build the new natural gas market, which is creating big opportunities in Brazil

We need to increase exploration in Brazil

The COVID-19 pandemic impacted exploratory activities in Brazil, accelerated energy transition discussions and reinforced the sense of urgency in exploring our resources

01

Only 5% of the sedimentary area is contracted and just 30 thousand wells have been drilled to date



02

Net zero scenarios imply a drastic drop in oil demand. As less capital will be available for investments in O&G the least competitive countries will quickly be highly impacted



03

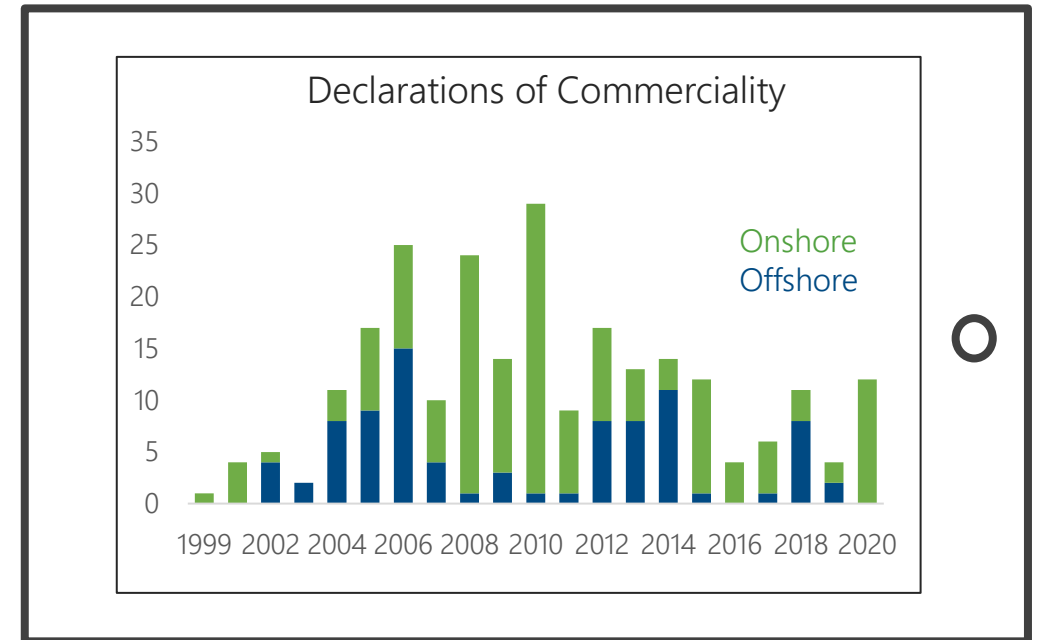
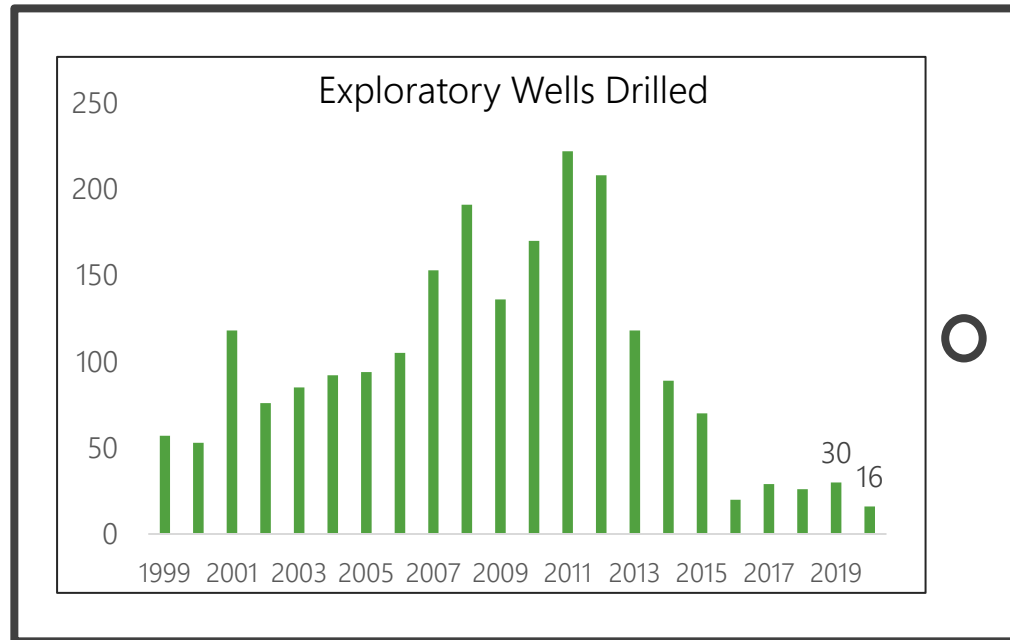
Brazil has seen a sharp decrease in exploration activities in offshore new frontiers. Focus is basically on the pre-salt due to its high potential and smaller carbon footprint



Brazil has a fantastic geological potential still unexplored with great opportunities

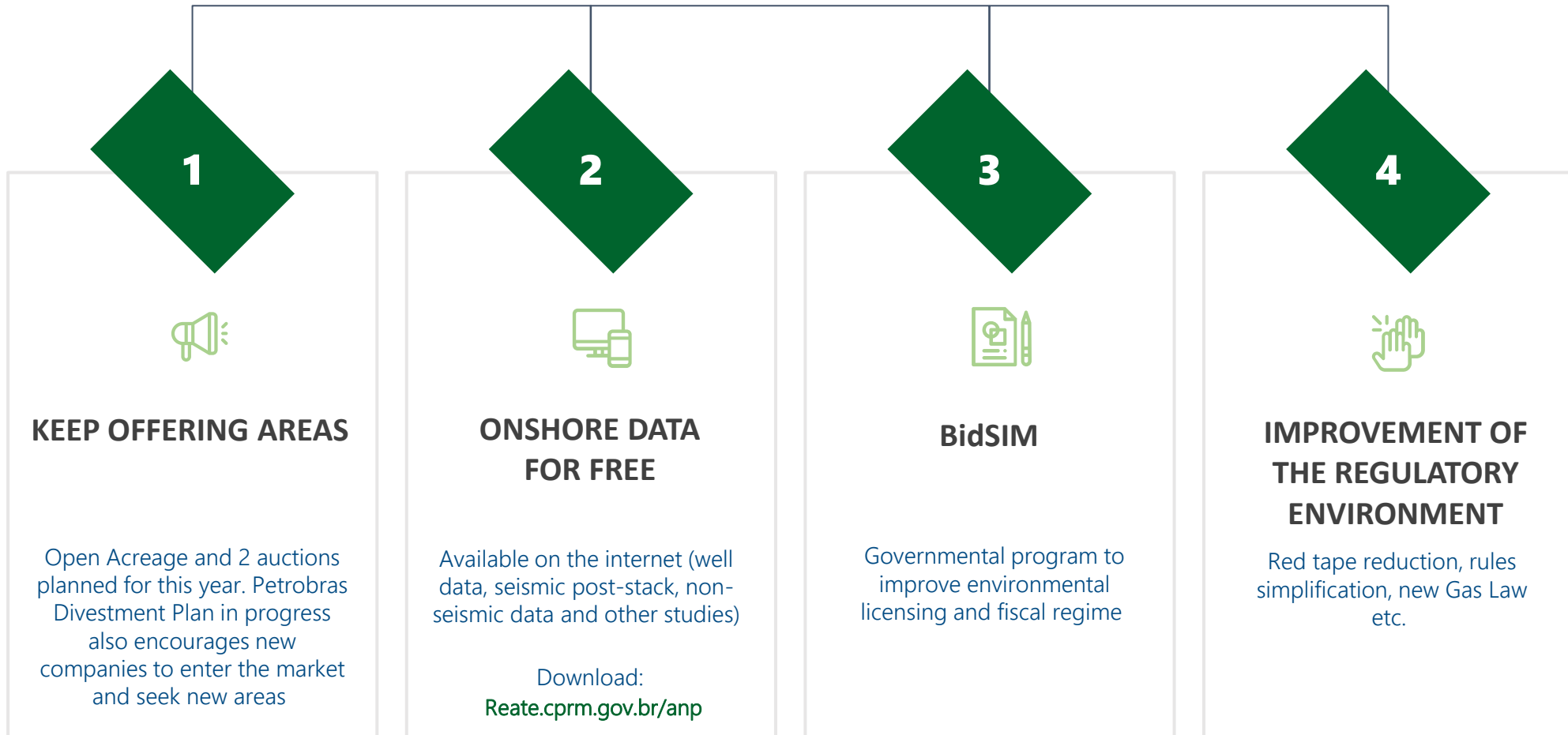


A print screen of exploratory activities and results



2021 forecast: 45 wells in exploratory blocks (26 onshore/19 offshore) and investments of **R\$ 6.5 billion**

Measures to increase exploration activities



Brazil has great opportunities in 2021 auctions

ROUND 17 Brazil

OIL AND GAS CONCESSIONS

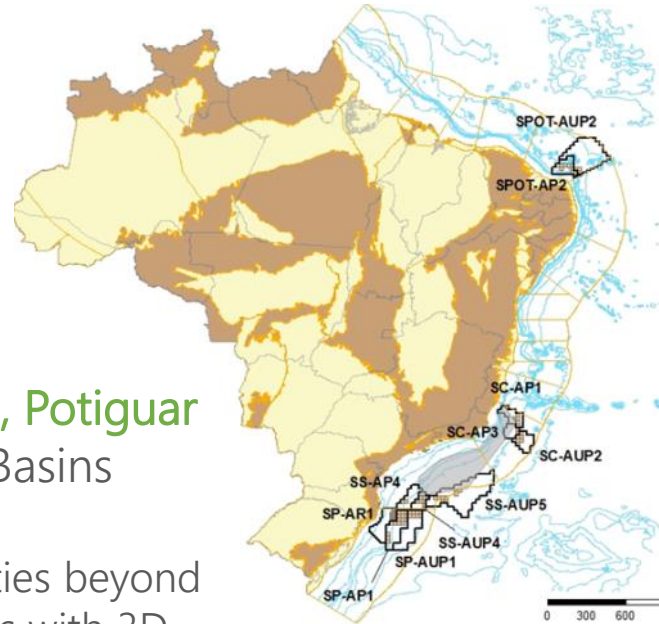
92 blocks on offer

1

Campos, Pelotas, Potiguar
and Santos Basins

Pre-salt opportunities beyond
200 nautical miles with 3D
seismic recently acquired

October 7th



TRANSFER OF RIGHTS SURPLUS Brazil

PRODUCTION SHARE

12b bbl (OOIP)

Atapu Prod:
91k boe/d in May 2021

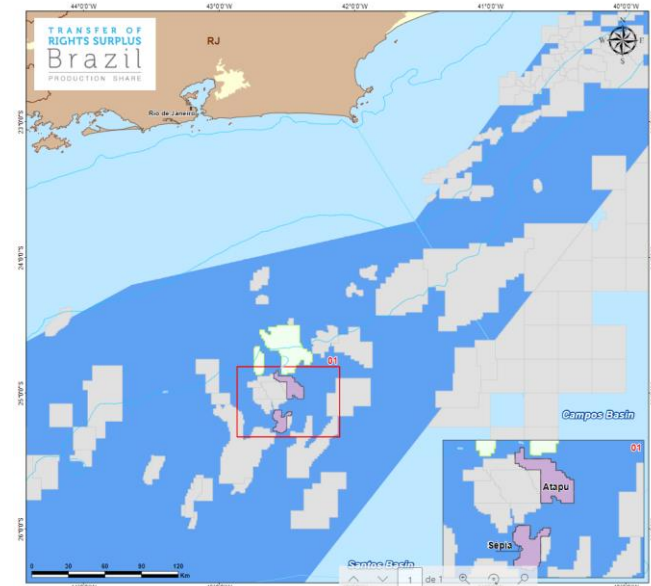
Sépia: first oil
expected this year

Technical and economical parameters approved by CNPE

December 17th

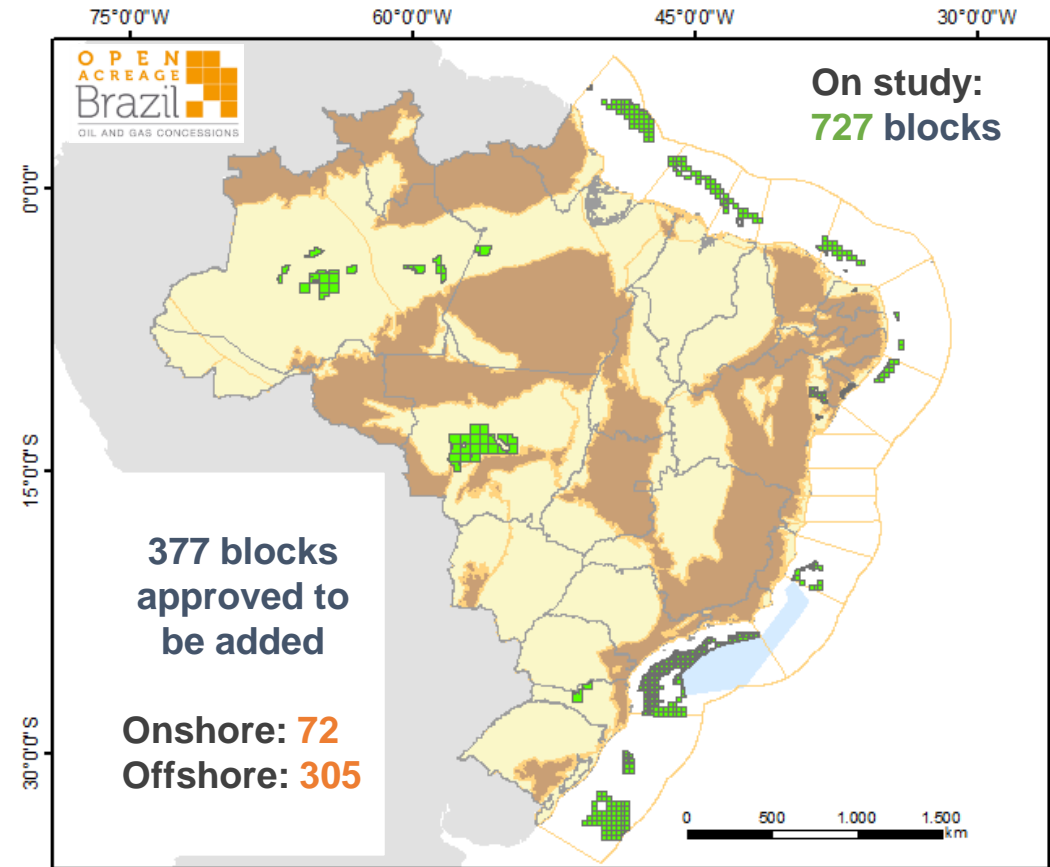
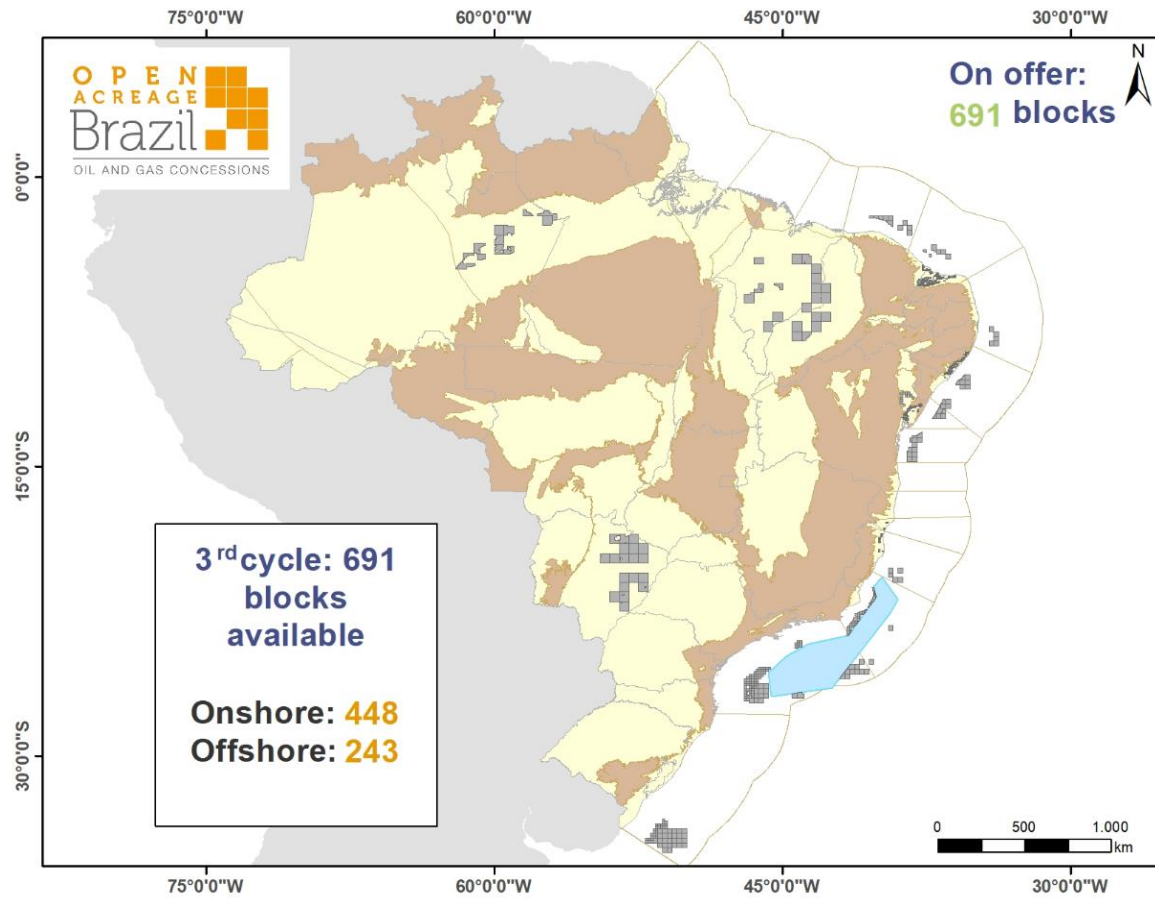
Atapu and Sépia (pre-salt fields)

2



Opportunities in the Open Acreage

The Open Acreage allows the market to decide when bidding rounds will take place and what areas will be offered
 In addition to the 691 blocks already available 377 new blocks will be added to the menu



The 3rd cycle will start when any company declare interest in at least one area

The Production Phase

437 fields, of which 133 offshore and 304 onshore
264 fields produced in April 2021



2021:
Production
Maintenance
Forecast

2025:
Production growth
sustained by the
first oil of at least 15
new production
units, mostly in the
pre-salt



Investment Forecast
2021-2025:
BRL 262 billion

Decommissioning
opportunities:

**BRL 28 billion until
2025**



Huge transformation
with new operators
jumping in mature
fields already in
production due to
the Petrobras
Divestment Plan.

For instance (on
shallow water):



Three environments in production

73% of total production



Pre-Salt

122 wells
22,636 boe/d
Average well production

One of the best plays in the world. Some wells produce more than 50,000 boe/d

22% of total production



Post-Salt Offshore

343 wells
2,443 boe/d
Average well production

Offshore beyond the pre-salt; new frontiers and mature fields

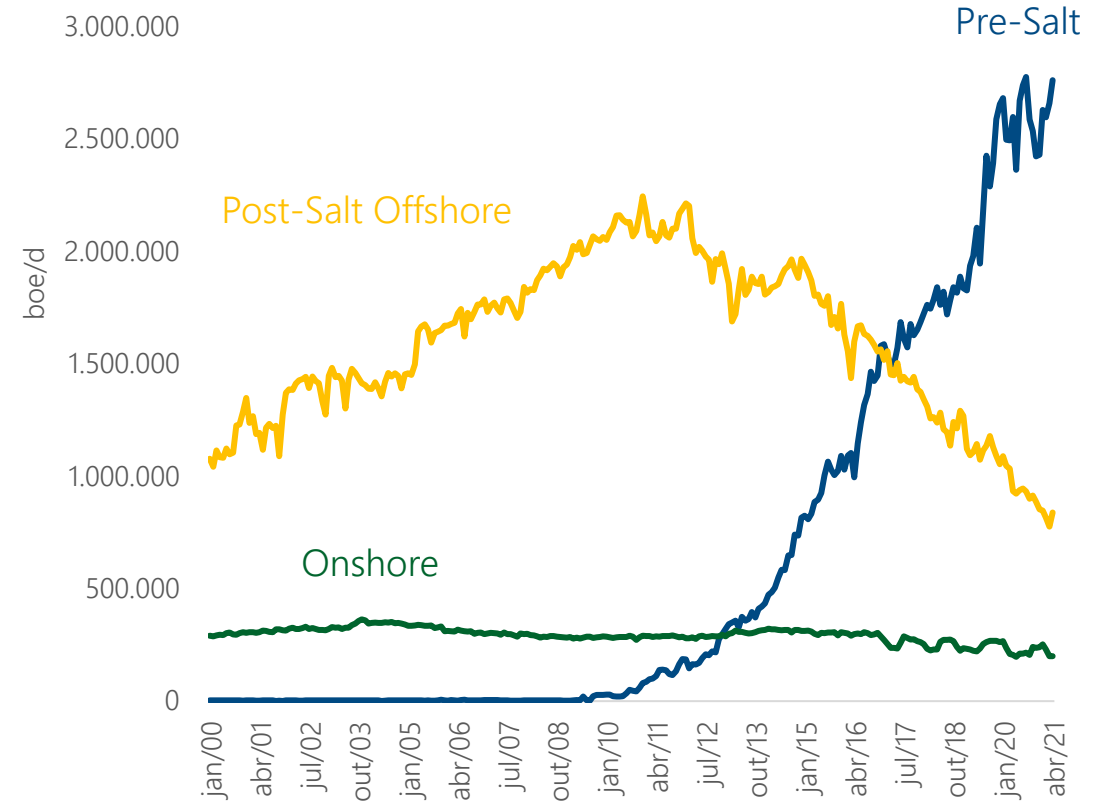
5% of total production



Onshore

5,947 wells
33 boe/d
Average well production

Mature and New Frontier Basins



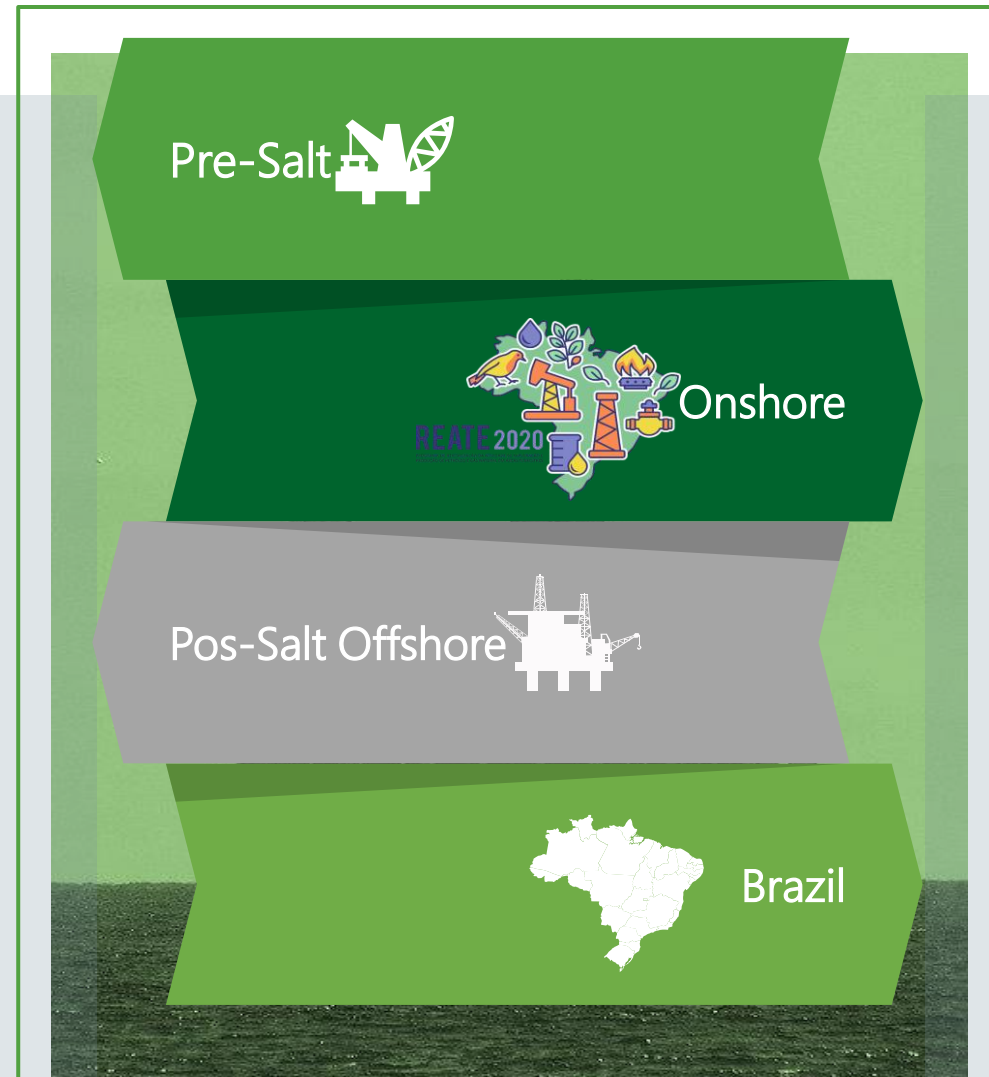
Pre-salt prioritization accelerated the decline in onshore and pos-salt offshore production

E&P strategic goals

Strategic goals for the three environments

Accelerate the **pre-salt** exploration and **development**

Increase mature fields **RF** and fasten exploratory activities in the **new frontier basins**

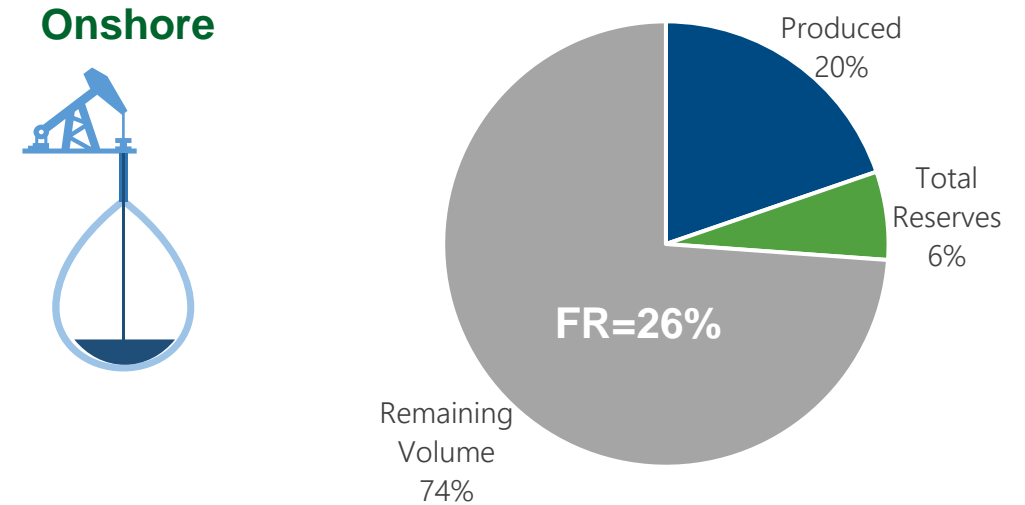
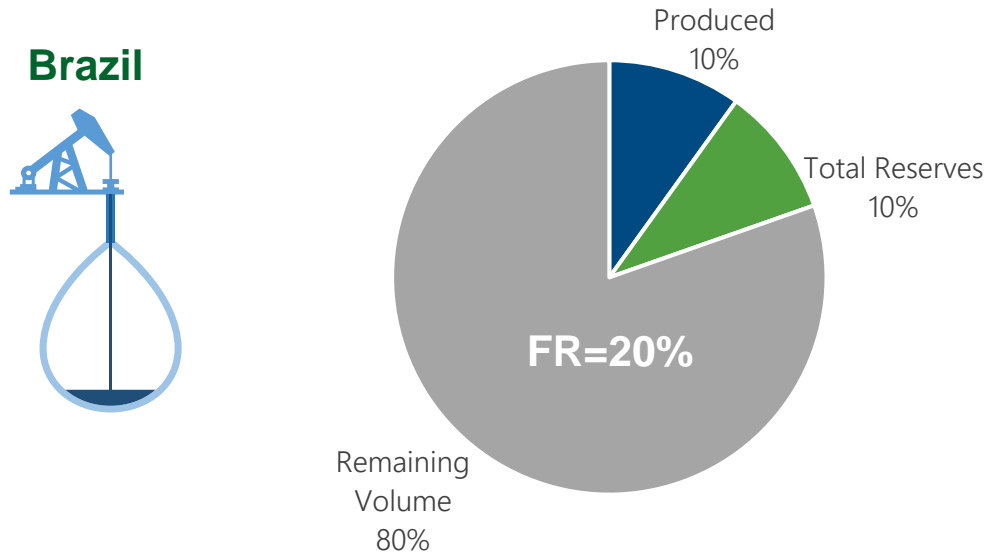


Revitalize the **onshore**, increase the mature fields **RF**, **support small and medium producers**, intensify **exploratory activities**, quantify the oil potential

Attract the **right players for each environment** (assets in right hands)

What we have already produced and our potential

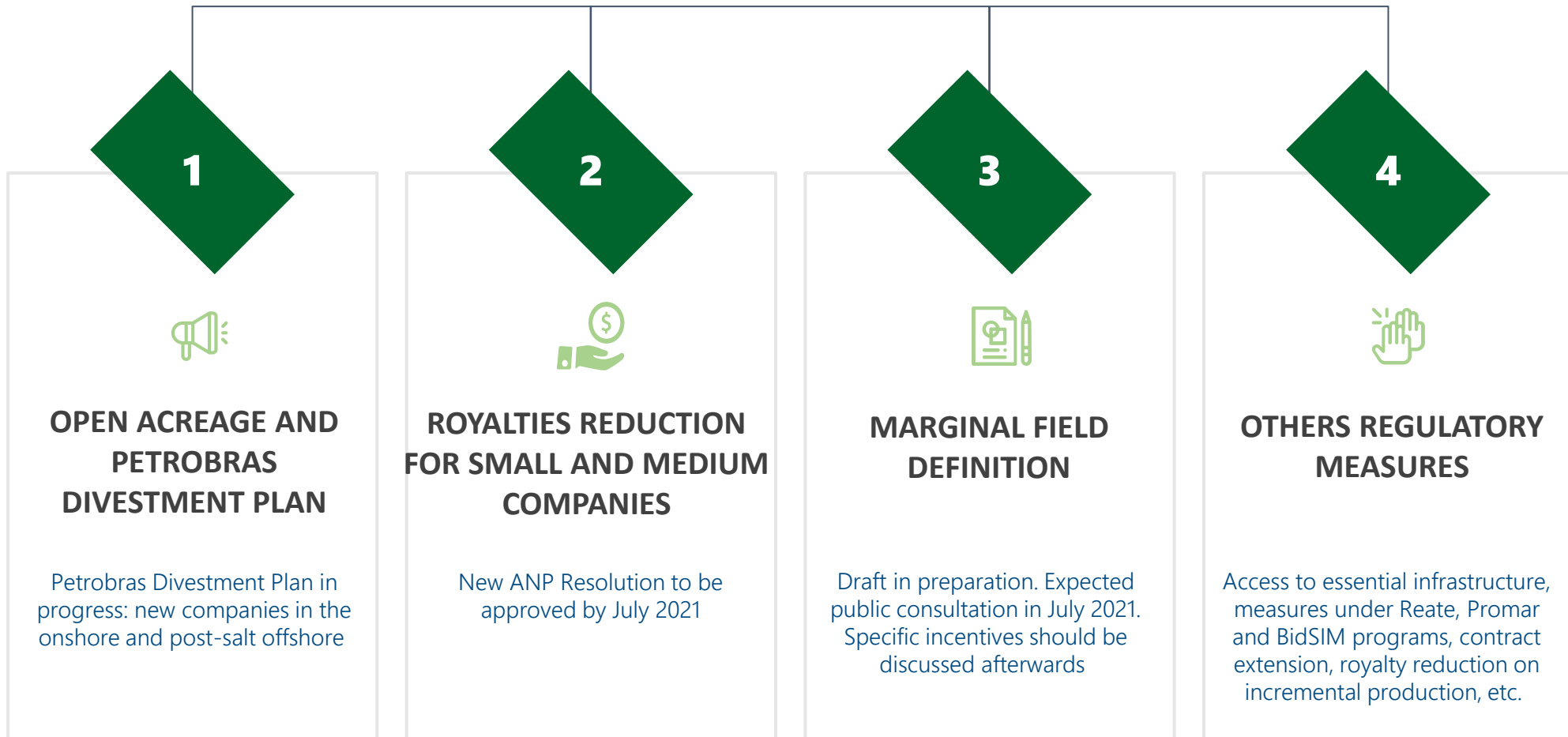
Brazil has produced only 10% of the volumes discovered in fields
 World average RF: 35%



	Brazil	Campos Basin	Onshore
1% more in the RF	2.4Bboe	1Bboe	200Mboe

Increasing the RF is an energy policy goal and must be pursued by all agents as per best practices

Ongoing measures to attract investment to fields in production



Final Remarks: E&P Business Environment in Brazil

Our Strengths

Brazil has never breached an E&P contract

Geological potential

Pre-salt: world-class low carbon intensity assets

Past and future bidding rounds (including open acreage)

Market opening (Petrobras Divestment Plan)

What we need to improve

Country risk

Environmental licensing in new frontier basins

Regressive tax regime

Red tape and the pace of reforms

Opportunities

In the short term: oil prices trending up

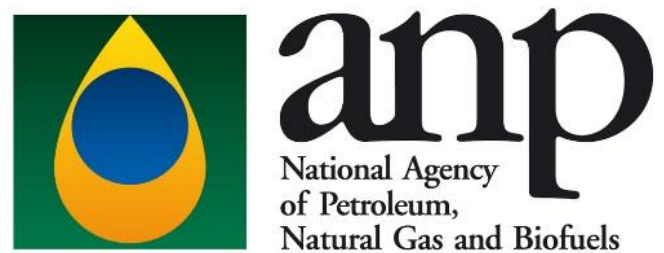
Last window of opportunity to explore less competitive assets

Threats

Global competition
(Middle East, shale oil/gas, Guyana/Suriname, Africa, countries with more progressive tax regimes etc)

Companies becoming more selective as there is less capital available for investment in E&P

Energy transition will lower demand for oil and gas



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