






# ONSHORE O&G OPPORTUNITIES AND THE BRAZIL NEW NATURAL GAS MARKET

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# #Disclaimer

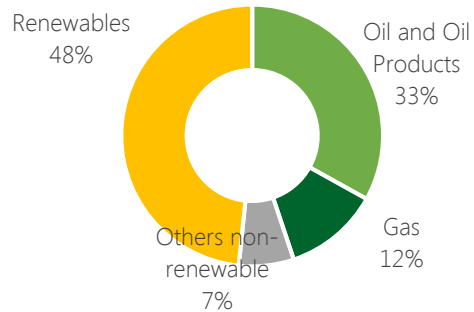
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# Brazil at a glance

A country of plenty and diverse energy resources



Energy Mix



The largest economy in  
**Latin America**

**213**

million people  
(6<sup>th</sup> largest population)

**1.44**

Trillion USD GDP  
2020  
(13<sup>th</sup> largest economy)

**8<sup>th</sup>**

Largest Crude Oil and Condensate producer  
(BP Statistical Review 2021)

**7<sup>th</sup>**

Largest Crude Oil Exporter  
(MME 2021)

**7<sup>th</sup>**

Largest Oil Products Consumer  
(BP Statistical Review 2021)

**2<sup>nd</sup>**

Largest Producer and Consumer of Biofuels  
(BP Statistical Review 2021)

**2<sup>nd</sup>**

Largest Hydropower generation in 2020  
(Our World in Data)

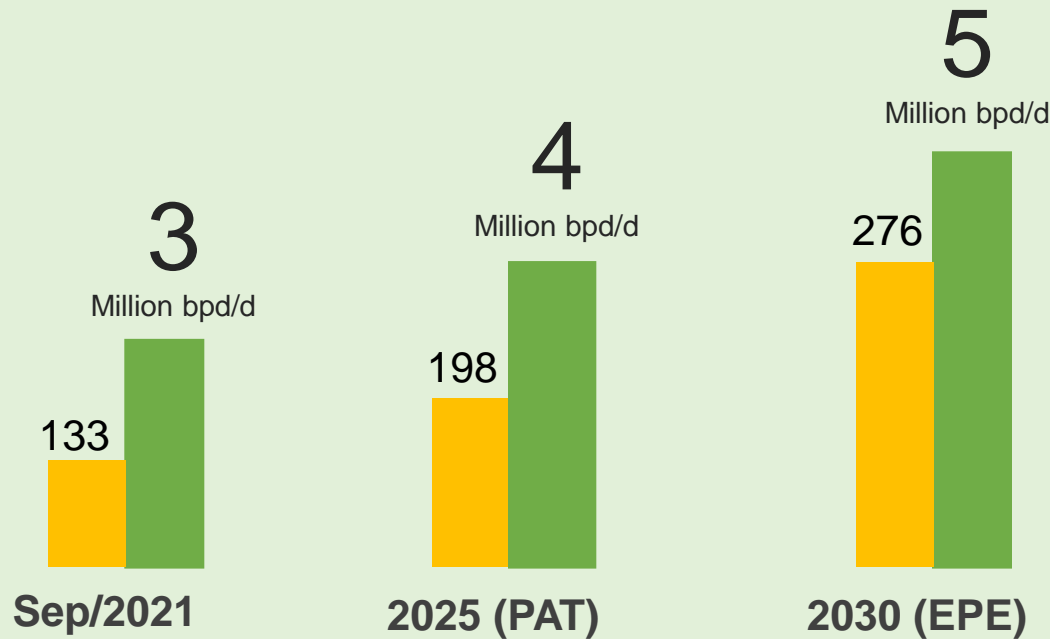
**6<sup>th</sup>**

Largest Wind Electricity Generation in 2020  
(IEA)

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

## O&G Production

Oil Gas (Mm3/d)



**1.37**  
Million bpd/d of crude oil export (Average 2021)

**5<sup>th</sup>**  
Largest crude oil exporter in 2030 (EPE)

**26B**

Barrels equivalent of O&G produced to date

## Reserves

**+14B**

Barrels equivalent of O&G in proved reserves (1P) (Dec 2020)

**+23B**

Barrels equivalent of O&G in total reserves (3P) (Dec 2020)

**85**

E&P company groups, ~50% foreign (Nov 2021)

**674**

Ongoing E&P Contracts

### Pre-Salt



**74%**  
of production

### Post-Salt



**20%**  
of production

### Onshore



**6%**  
of production

# E&P strategic goals



## RIGHT ASSETS IN THE RIGHT HANDS

Petrobras Divestment Plan plays key role in this goal.  
Support small and medium producers market



## INCREASE THE RECOVERY FACTOR

Brazil's Current RF: 10%, aiming to reach 20% (based on total reserves)  
1% more in the RF represents more 2.4Bboe produced



## INCREASE EXPLORATORY ACTIVITIES

The COVID-19 pandemic accelerated **energy transition** discussions and reinforced the **sense of urgency** in exploring our resources



## MAKE VIABLE THE MARGINAL DISCOVERIES

There are many **marginal discoveries** in the **different environments** that could be developed if we address the correct incentives to make them viable

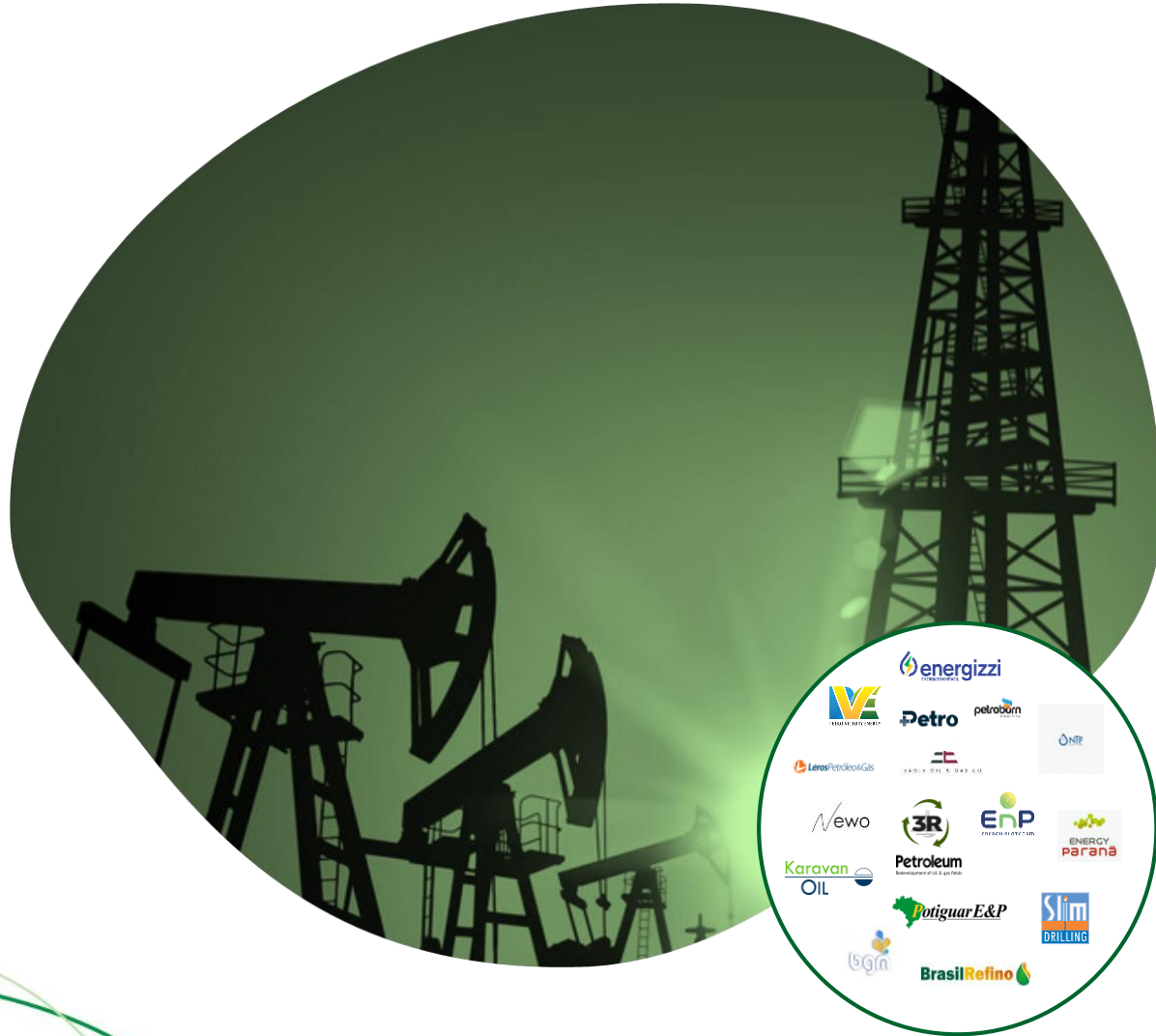
We need to keep increasing **above ground competitiveness** in order to achieve our main goals



#1

# The Onshore Market

# The onshore environment



## 2021

**55**  
Onshore E&P  
Groups



**115**  
Exploratory  
Blocks  
17 contracts  
suspended

**297**  
Onshore Fields  
14 under development  
36 being returned to ANP

**Production:**

**85k**  
Bpd of oil  
production  
(Oct 2021)

**25M**  
M<sup>3</sup> of gas  
production  
(Oct 2021)

**Reserves:**

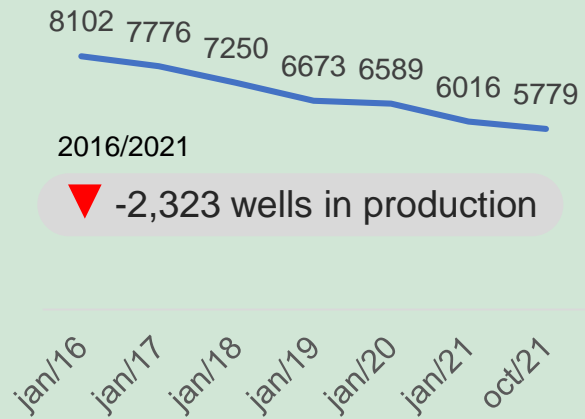
**448M**  
Bbl in proved oil  
reserves  
(Dec 2020)

**78B**  
M<sup>3</sup> in proved gas  
reserves  
(Dec 2020)

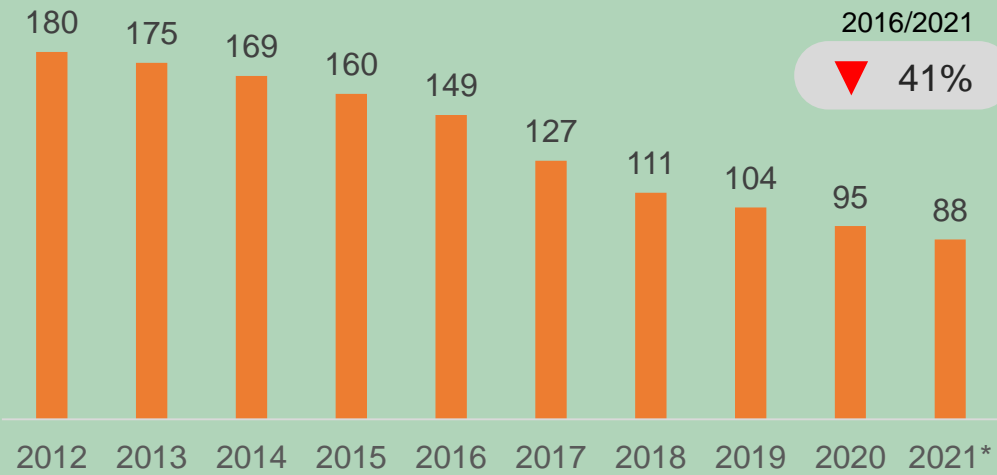


# Onshore: an environment that needs to resume activities

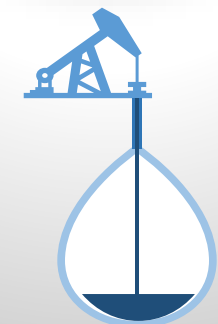
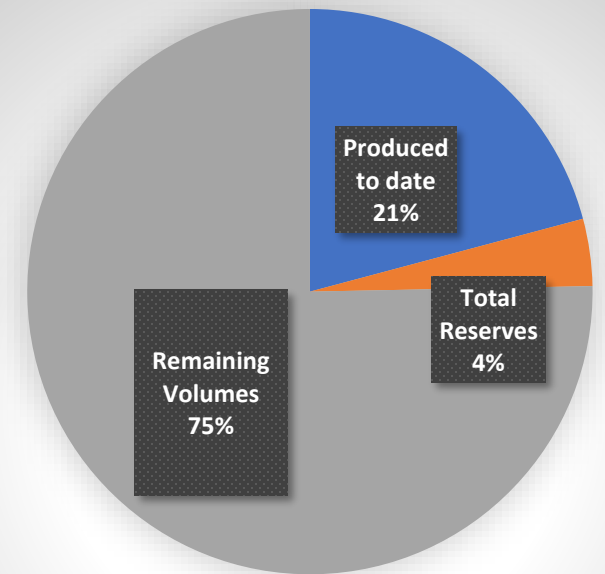
### Producing Wells



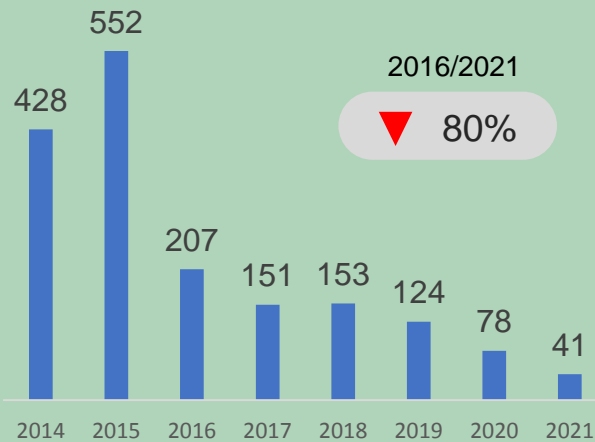
### Onshore Oil Production (kbpd)



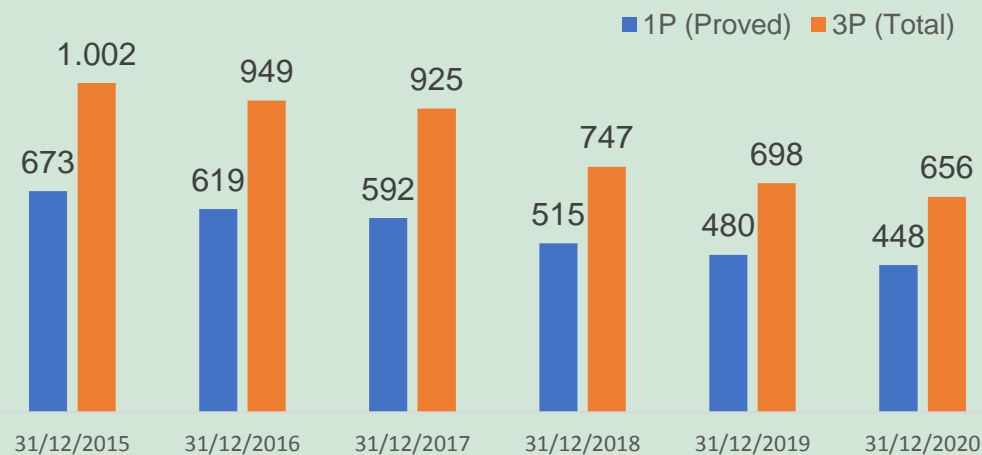
### Oil RF



### Onshore New Wells

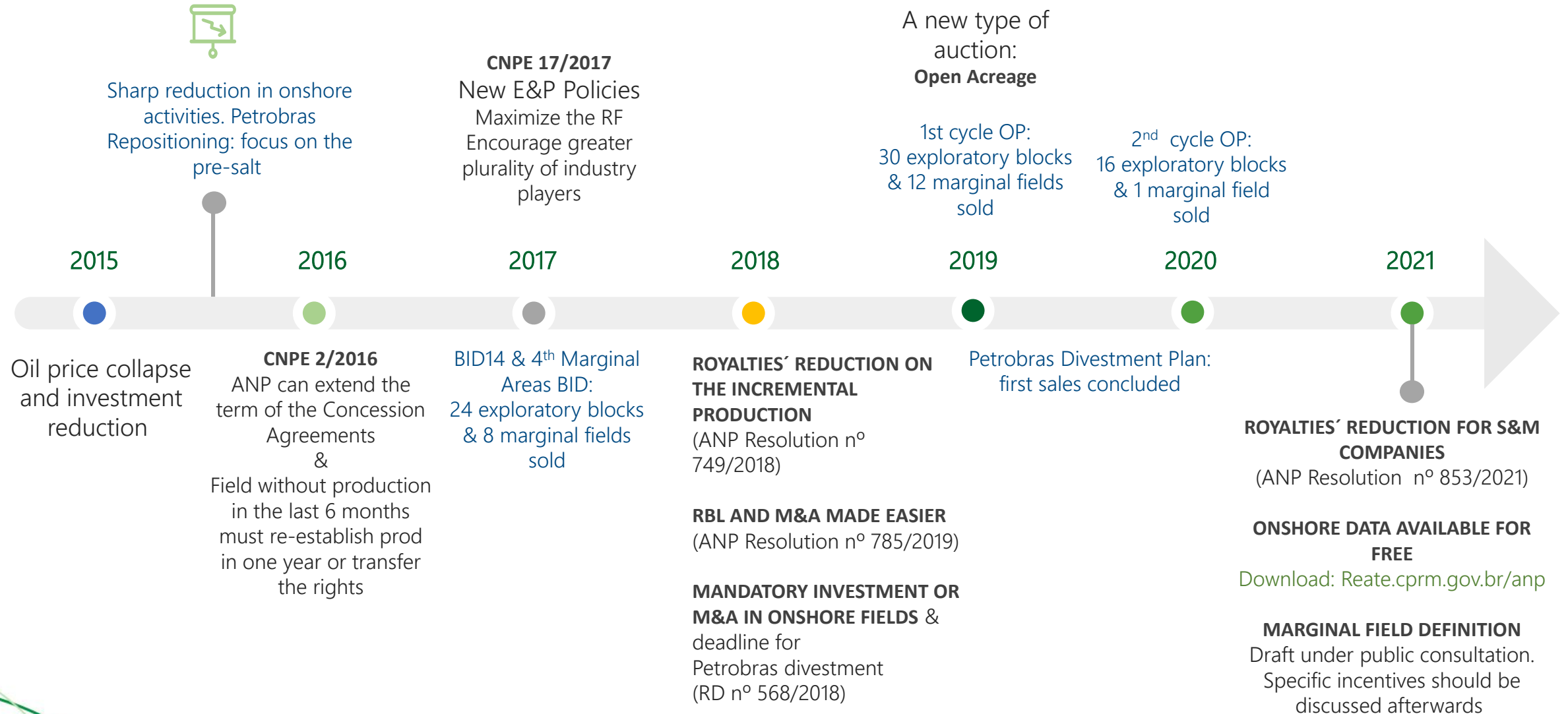


### Oil Reserves (Million barrels)





# Many measures have been taken to incentivize onshore activities



# The greatest transformation



All onshore fields are being sold by Petrobras.  
**107 onshore** fields: sales concluded



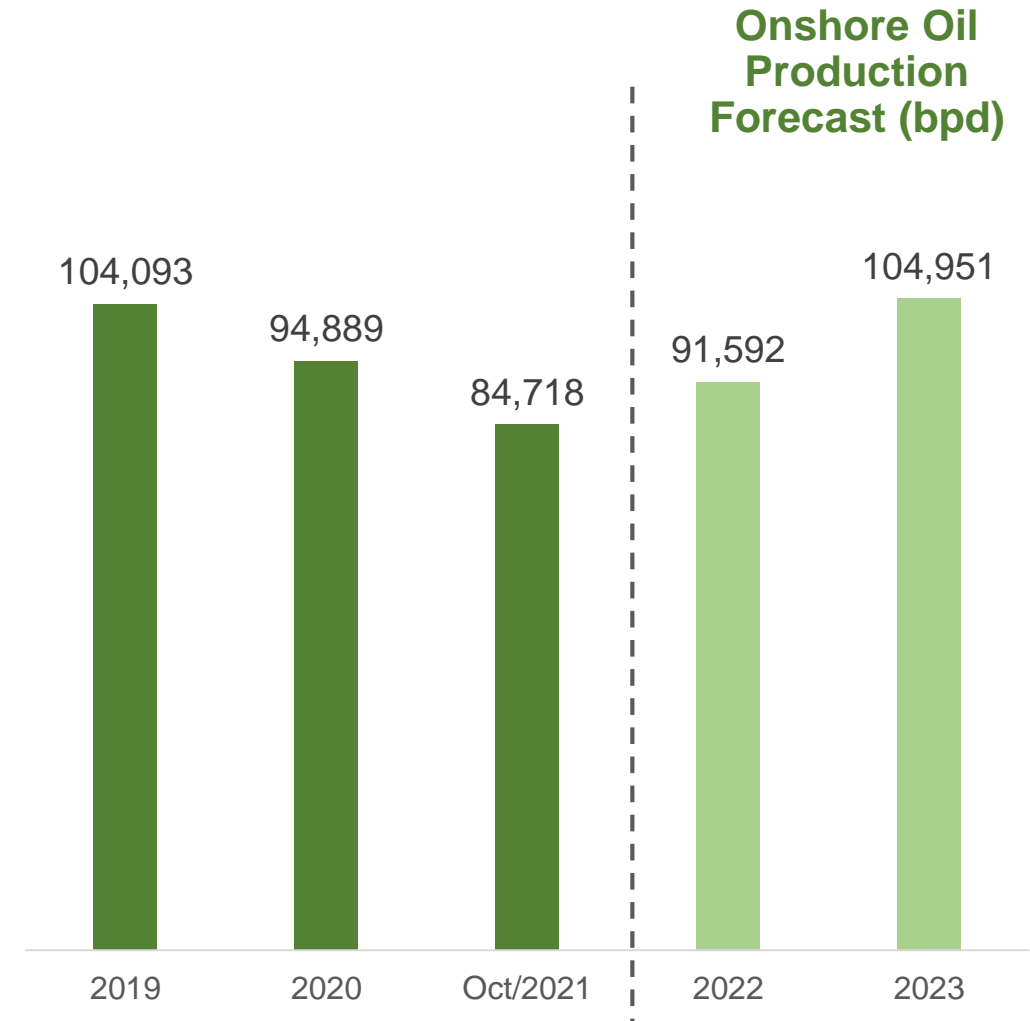
The numbers of E&P groups acting in onshore activities increased more than **30%** since 2016



New operators are increasing production. A rebound in the onshore oil production is expected for the coming years



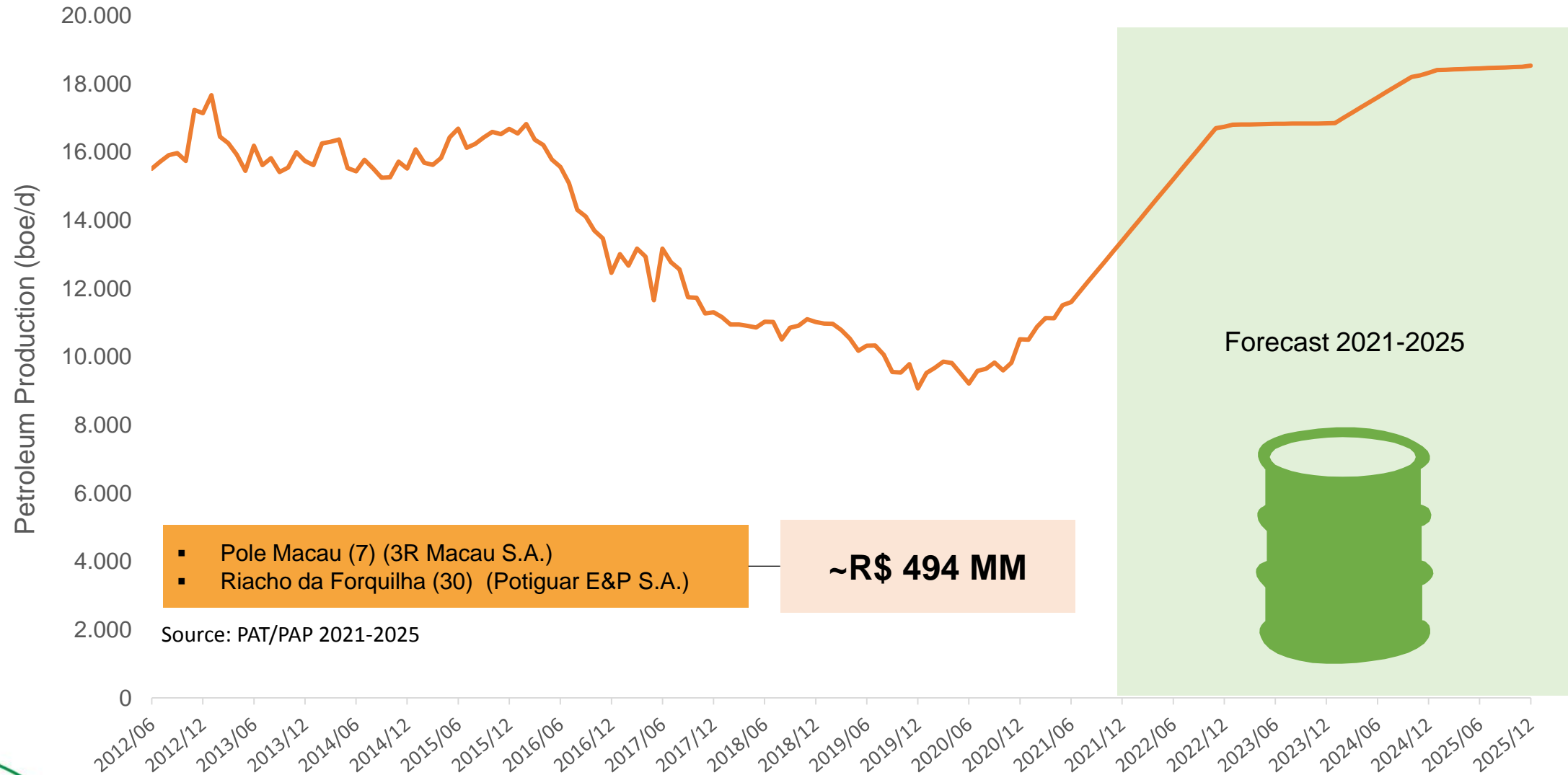
Huge opportunities to increase RF in mature fields. 1% more in onshore RF: **200 Mboe**



Source: PAP 2022-2026

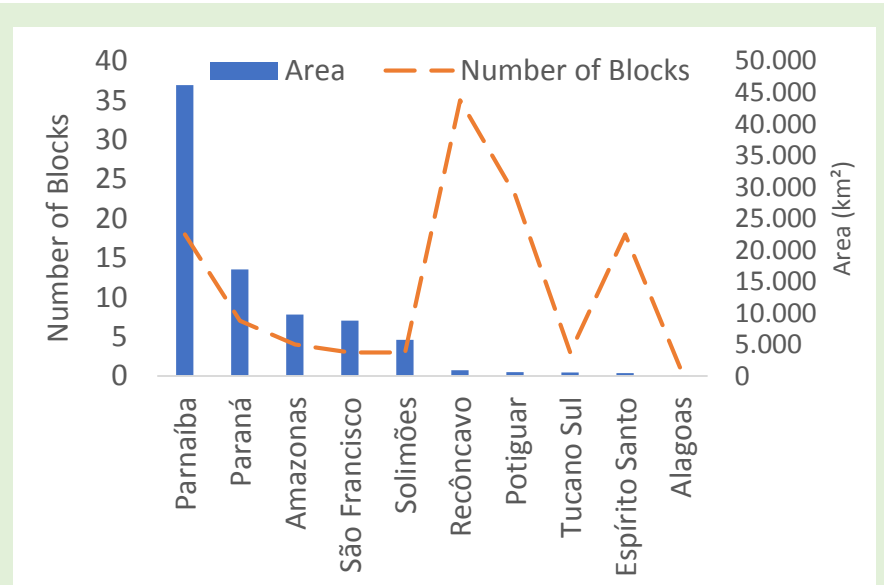
# Successful examples of new operators

Production & Forecast – Macau and Riacho da Forquilha Poles



Source: PAT/PAP 2021-2025

# There is also plenty of opportunities to increase national gas production in the onshore

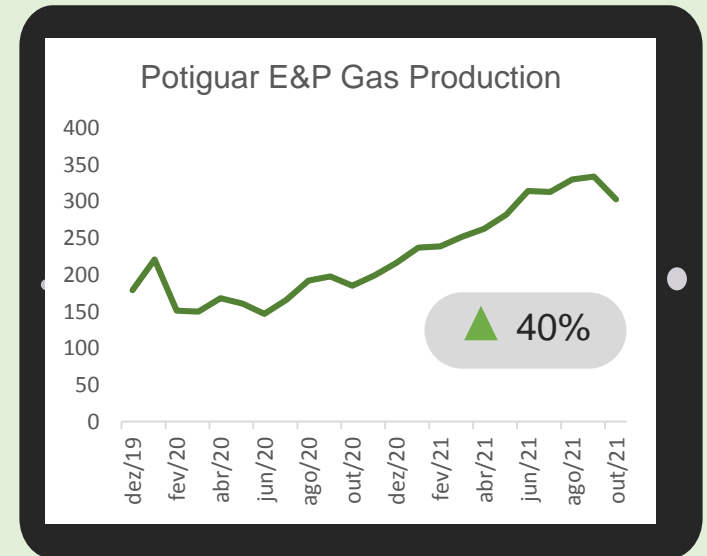


4 paleozoic basins with potential for natural gas: Parnaíba, Solimões, Amazonas, Paraná basins. Most of the **onshore exploration in new frontier basins is to produce gas.**



Source: Eneva, Imetame

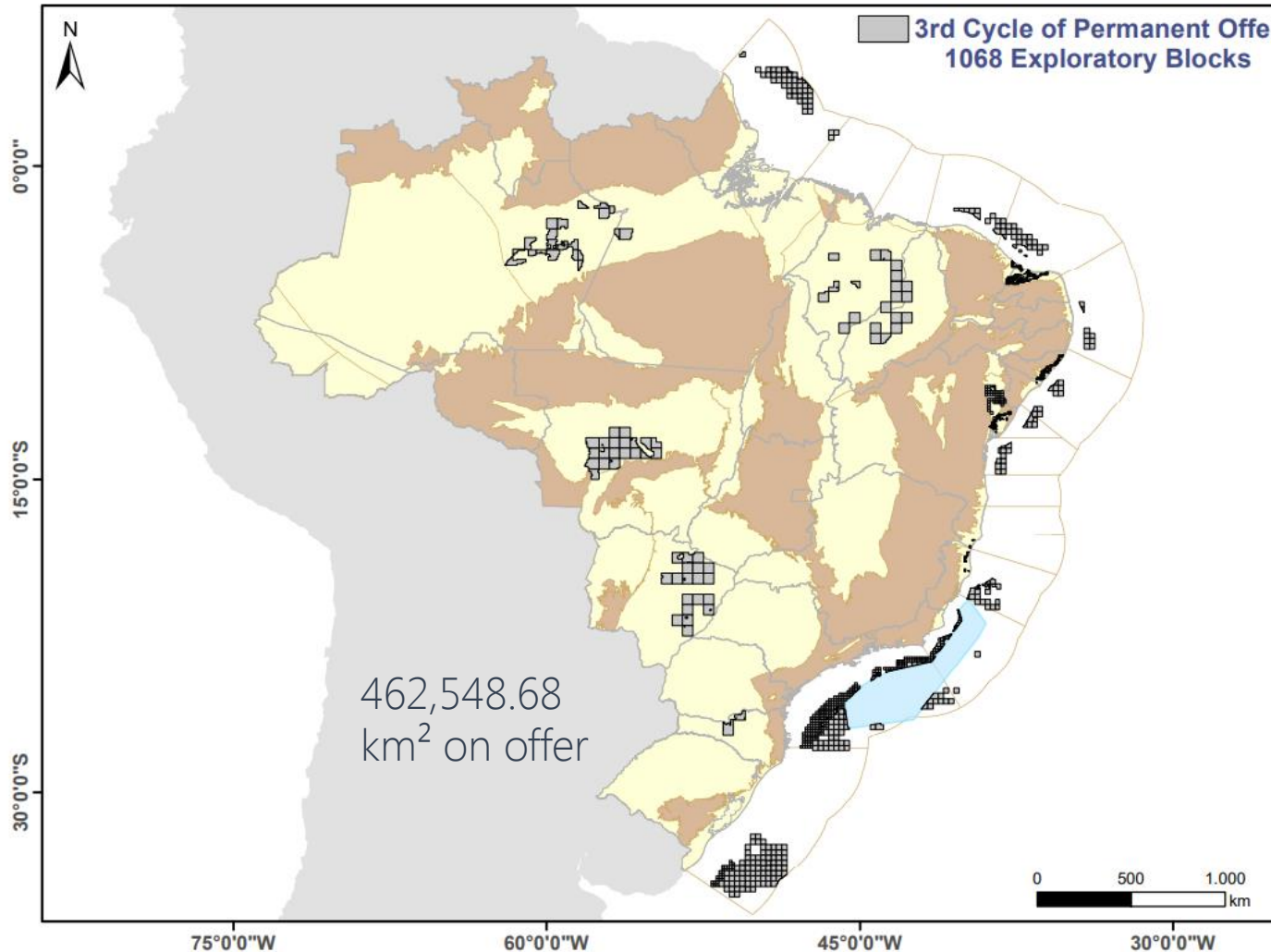
**Reservoir to Wire Model:**  
Competitive production costs.  
Relevant projects in Maranhão, Amazonas & Bahia States



**Petrobras Divestment Plan can untap more gas opportunities.**  
New operators in mature fields are also increasing/restoring gas production

# 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 objective of the Open Acreage is to decentralize exploratory investments in the country, with opportunities being available at any time. The 3rd cycle will start when any registered company declares interest in at least one area.



**1,068  
blocks  
already  
available in  
17 basins**



**522  
onshore  
blocks on  
offer**

# 15 Marginal Fields to be added in the future cycles

+ 223 exploratory blocks in  
11 basins (276,561 km<sup>2</sup>)



Field	Basin	In Place Volumes (million m <sup>3</sup> )		Produced to date	
		Oil	Gas	Oil	Gas
Mariricu Oeste	Espírito Santo	0.72	19.83	0.008	0.37
Jacupemba	Espírito Santo	1.5	70.47	0.00006	0.0008
Nativo Oeste	Espírito Santo	7.71	131.14	0.031	0.46
Rio Itaúnas Leste	Espírito Santo	0.27	24.45	0.005	4.21
Barra do Ipiranga	Espírito Santo	0.68	1999.6	0.072	1387.1
Rio Barra Seca	Espírito Santo	0.56	1300.94	0.015	743.65
Rio São Mateus Oeste	Espírito Santo	6.65	1021.89	0.33	260.31
Japiim	Amazonas	0.044	661.14	0	0
Lagoa Branca	Tucano Sul	0.01	465.54	0	0
Aracuã	Sergipe	0.15	16	0.01	3.36
Graúna	Potiguar	0	125.31	0	0.64
Pitiguari	Potiguar	0.67	269.83	0.00028	6.18
Guará	Sergipe	29.57	0	0.000005	0
Tico-Tico	Recôncavo	0.067	2.01	0.001	0.014
Sempre Viva	Tucano Sul	0.03	0	0.0008	0

The background is a light green color. There are several decorative green lines of varying thicknesses and colors (some are a darker green, some are a lighter green) that curve and flow across the page, primarily on the right and bottom sides.

#2

# The Natural Gas Market

# The natural gas market

Natural gas production in Brazil is mainly associated with oil produced in offshore fields

Other sources include imports through pipelines from Bolivia and LNG through regasification terminals

Only around 40% of the national production is consumed by the Brazilian market due to lack of demand/infrastructure and high gas prices

Recently, we saw a great increase in gas demand due to the economic recovery and the worst drought in more than 90 years

## SUPPLY



## DEMAND



### National Production



### Industrial



### Bolivia Imports



### Electric Generation



### Cogeneration



### LNG Imports



### Automotive



### Others

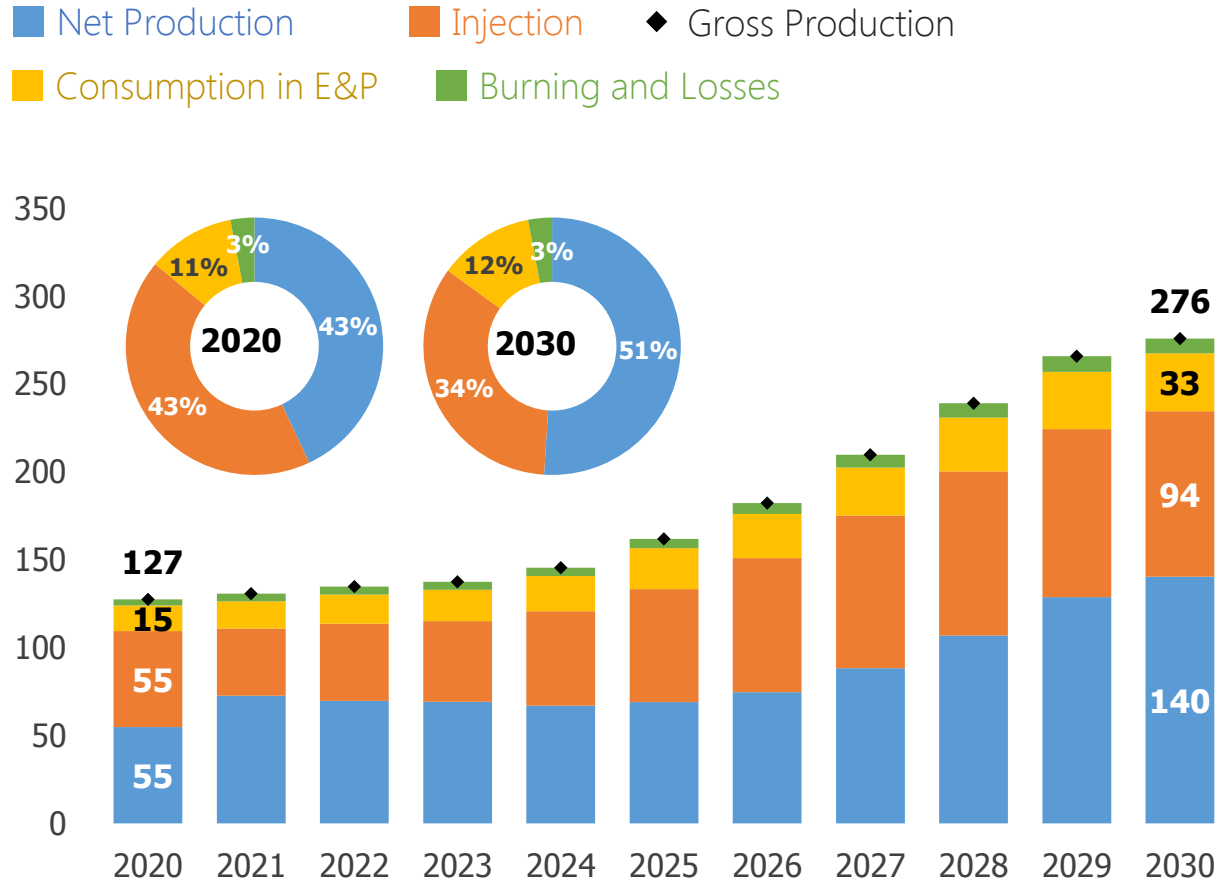


\*Jan-Aug 2021 (Average)





# The national gas production has the potential to double by 2030, but all efforts should be done to monetize it



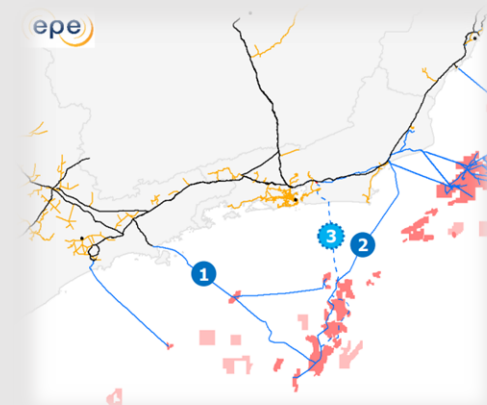
Source: EPE PDE 2030

The main driver of growth will be the **pre-salt production**

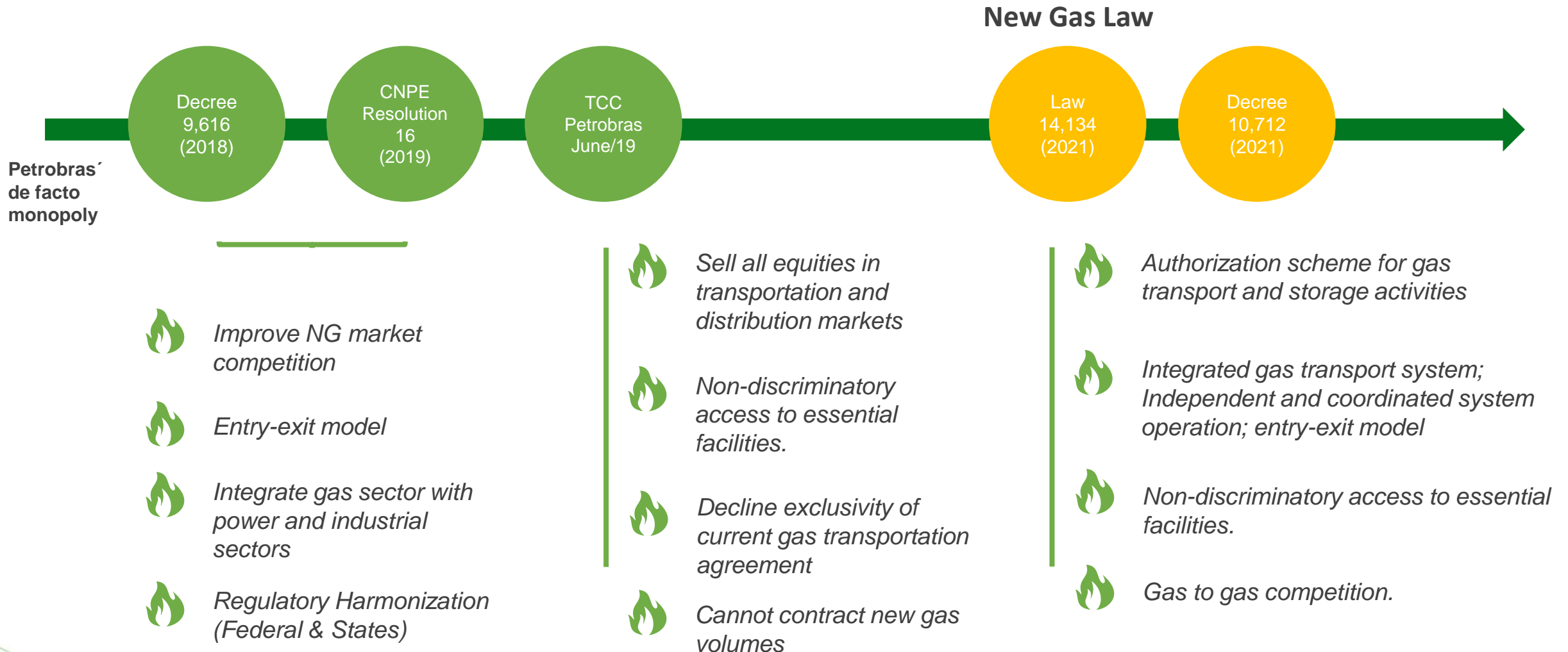
EPE expects the pre-salt liquid gas production to reach more than **70 million m<sup>3</sup>/d in 2030**

Need to **expand the gas pipeline infrastructure** to bring the gas to shore (**at least 1 or 2 more routes**)

Capacity limit of Routes 1, 2 and 3:  
44-48 million m<sup>3</sup>/d

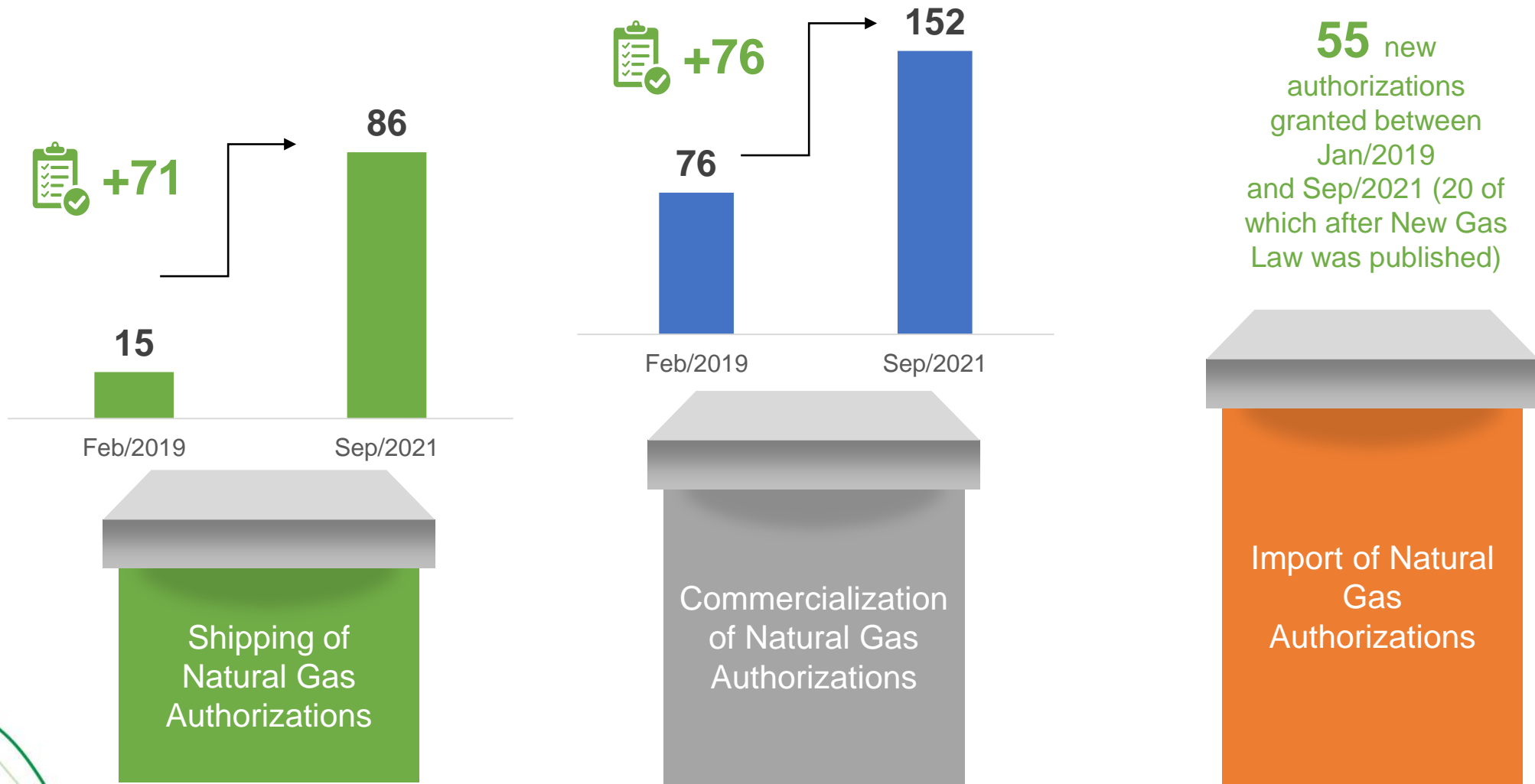


# Brazil is moving towards a competitive gas market



# And the interest in the Brazilian gas market is increasing

Since TBGs 1<sup>st</sup> Open Season, starting in Feb. 2019, many new commercialization, shipping and import authorizations were granted



# Main regulatory challenges in the new gas market



## Lack of competitive forces

More suppliers, carriers and free consumers are needed



## Lack of market driven gas price mechanisms

Trade hubs and exchanges



## Lack of third-party access

Essential Facilities Doctrine



## Lack of transportation infrastructure

Authorization of new pipelines infrastructure



### ANP's Conceptual Model of the Gas Market

The document deals with commercialization and shipping of natural gas as well as balancing mechanisms (3 workshops were promoted by ANP throughout 2021)

ANP is working on a new resolution dealing with 3<sup>rd</sup> Party Access (Multi study group dedicated to this subject)

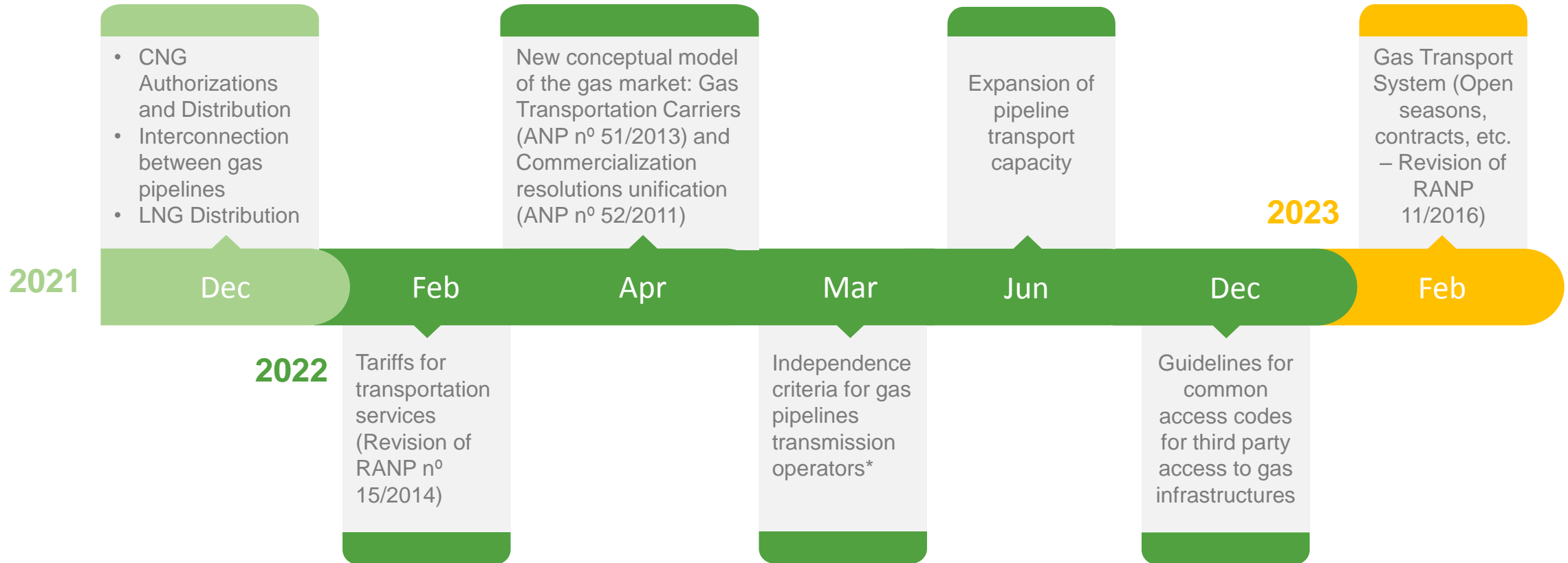
Open seasons are being conducted considering 1 year contracts

ANP expects the new granting regime established by the new Gas Law will give rise to new pipelines

# ANP regulatory agenda 2021-2023

A robust regulatory agenda is underway to implement the new NG market

## Start of Public Consultation Forecast



\* An initial draft of the Independence Criteria resolution has already been submitted to Public Hearing (Jan/21), but intense debates indicated the need for a second round of events

# Open Season Calendar

Annual Open Season to offer available capacity		
	Tender and Contracts Publication	Estimated Conclusion
TBG	October 25 <sup>th</sup> 2021	December 2021
NTS	2022	
TAG	2022	

Incremental Open Season		
	Tender and Contracts Publication	Estimated Conclusion
TBG	November/2021	March/2022
NTS	December/2021	March/2022
TAG	2022	

# Opportunities in the Gas Market

01

Petrobras Divestment Plan in the Transport and Distribution Sectors (CADE agreement)

02

New legislation already approved moving towards an opening and competitive gas market (Law 14,134/2021 and Decree 10,712/2021)

03

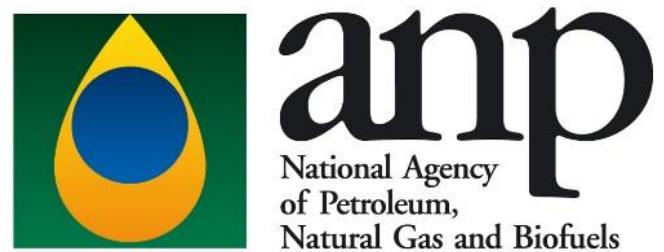
National gas production expected to almost double until 2030, with a variety of suppliers

04

Great potential to increase the national gas demand if the market offers competitive prices







<http://rodadas.anp.gov.br/pt/>

[www.gov.br/anp/pt-br](http://www.gov.br/anp/pt-br)

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