THE OIL, GAS AND BIOFUELS INDUSTRY IN BRAZIL

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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**

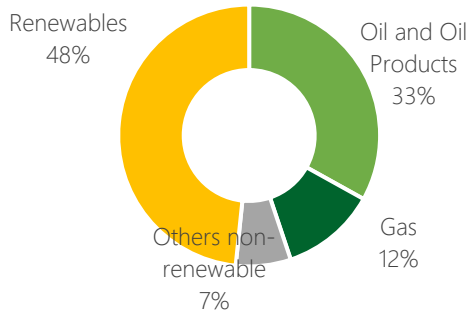
#1

Brazil and its great energy opportunities

Brazil at a glance

A country of plenty and diverse energy resources

Energy Mix



The largest economy in Latin America

213
million people
(6th largest population)

1.44
Trillion USD GDP 2020
(13th largest economy)

8th
Largest Crude **Oil and Condensate producer**
(BP Statistical Review 2021)

7th
Largest Crude **Oil Exporter**
(MME 2021)

7th
Largest **Oil Products Consumer**
(BP Statistical Review 2021)

2nd
Largest Producer and Consumer of **Biofuels**
(BP Statistical Review 2021)

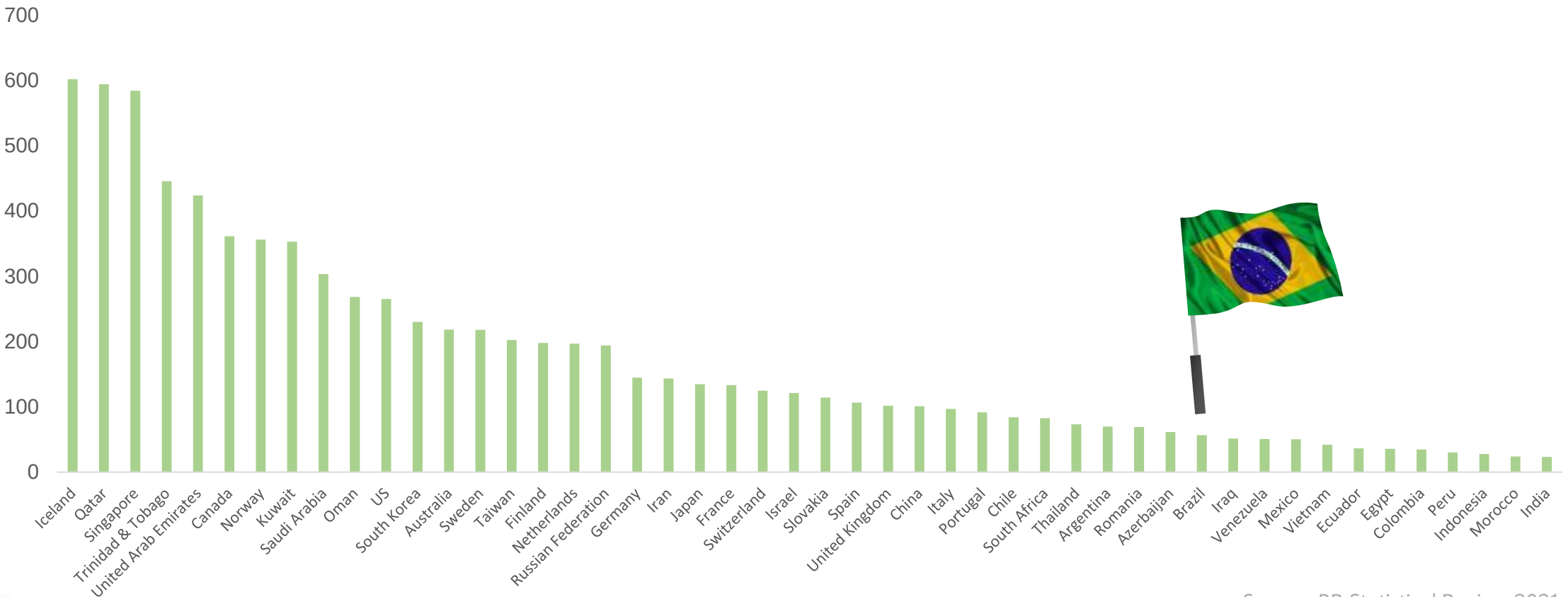
2nd
Largest **Hydropower** generation in 2020
(Our World in Data)

6th
Largest **Wind Electricity** Generation in 2020
(IEA)

Brazilian energy consumption will grow, opening great investment opportunities

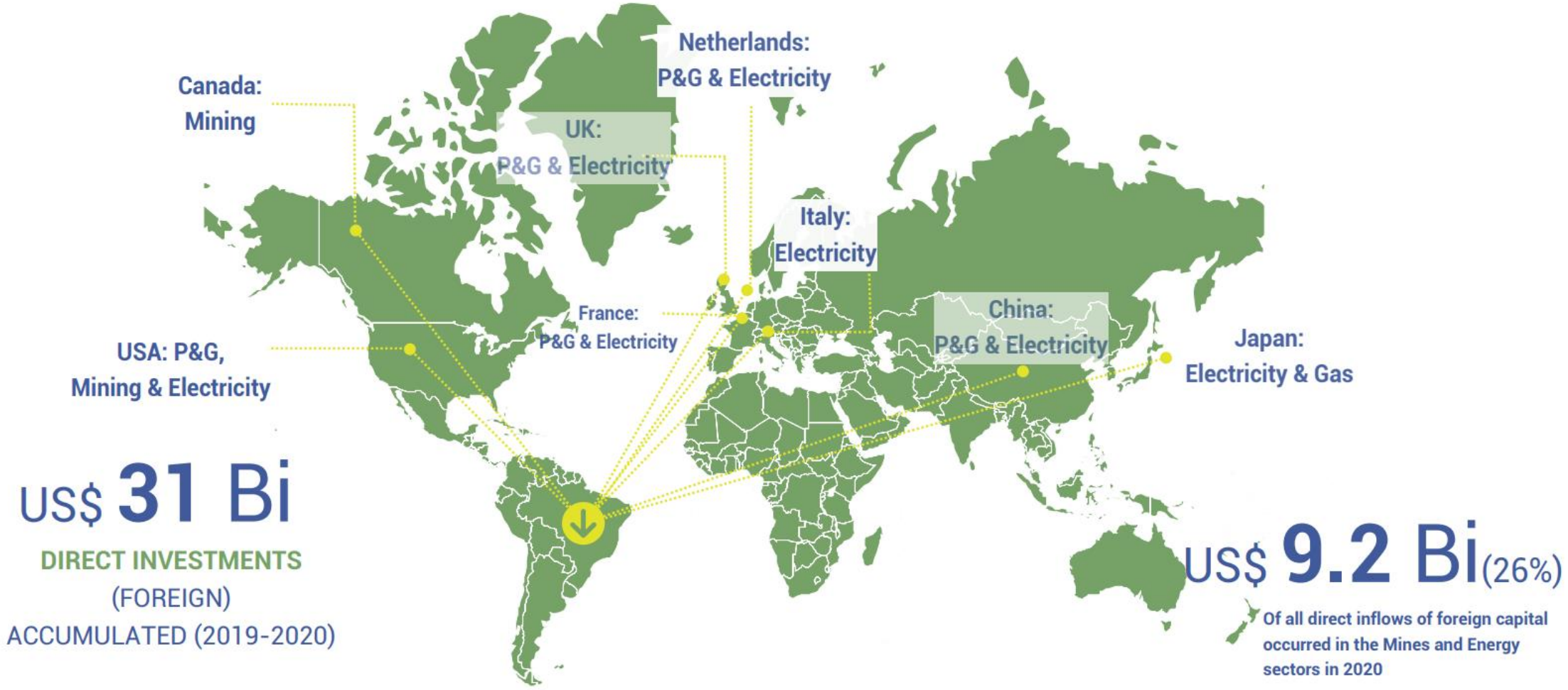
Primary Energy Consumption per capita (Gigajoule)

Low energy consumption per capita when compared to many countries



Source: BP Statistical Review 2021

Energy Foreign Investments flow in Brazil



Source: MME 2021

An unprecedent transformation in the O&G Sector

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, pre-salt fields and offshore blocks in the exploratory phase, 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, free consumers and distributors. An open season calendar is set for this year.

#2

The E&P Sector

Even at challenging times, the E&P has responded with remarkable resilience

2020

5% of production growth and exports record

Pre-salt high performance

Exports of oil and fuel oil with low sulfur content

2nd Cycle of Open Acreage

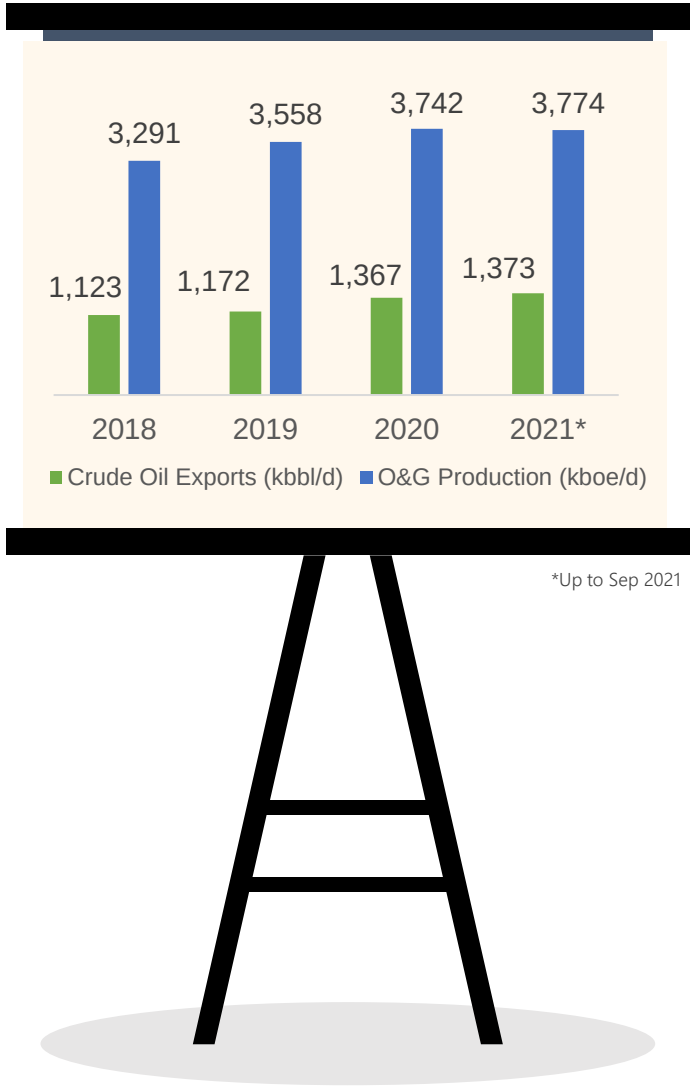
Performed in December: 18 areas sold

Assets Acquisition

50 M&As approved by ANP

COVID 19

Flexible emergency measures - supportive approach by ANP



2021

Slightly growth of O&G production and exports

Potential new records

2 Bidding Rounds

5 areas sold in the 17th Round

ToR BID scheduled to Dec 2021

1,068 areas available in the Open Acreage

Assets Acquisition increased

77 M&As approved by ANP up to November

COVID 19

Returning to business-as-usual, but continued flexibility available where required

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

2021

8th
Crude Oil and Condensate producer (BP Statistical Review 2021)

86
E&P company groups, ~50% foreign (Oct 2021)

Production:

3M
Bpd of oil production (Sep 2021)

133M
M³ of gas production (Sep 2021)

Reserves:

12B
Bbl in proved oil reserves (Dec 2020)

337B
M³ in proved gas reserves (Dec 2020)

Forecast

Potential to reach more than

5
million oil bpd in 2030 (EPE)

Potential to be the

5th
Largest crude oil exporter in 2030 (EPE)

E&P at a glance

Pre-Salt

One of the best plays in the world and the most competitive deepwater assets.

74%	130	21,886
of production	producer wells	Average well production (boe/d)

Prod: **2,845,213** boe/d

Post-Salt

Green and brownfields, deep and shallow waters.

20%	332	2,284
of production	producer wells	Average well production (boe/d)

Prod: **758,366** boe/d

Onshore

Mature basins and new frontier basins (gas prone).

6%	5,779	41
of production	producer wells	Average well production (boe/d)

Prod: **236,111** boe/d

*Sep 2021

26B
Barrels equivalent of O&G produced to date

375
Fields under development or production

249
Exploratory Blocks

400+
Production Installations

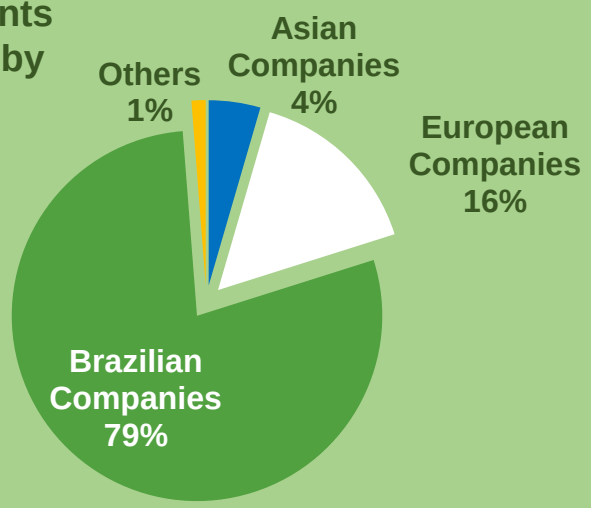
50
Billion dollars E&P Investments Forecast 2021 – 2025

5
Billion dollars Decommissioning Costs 2021-2025

30,000+
Wells drilled

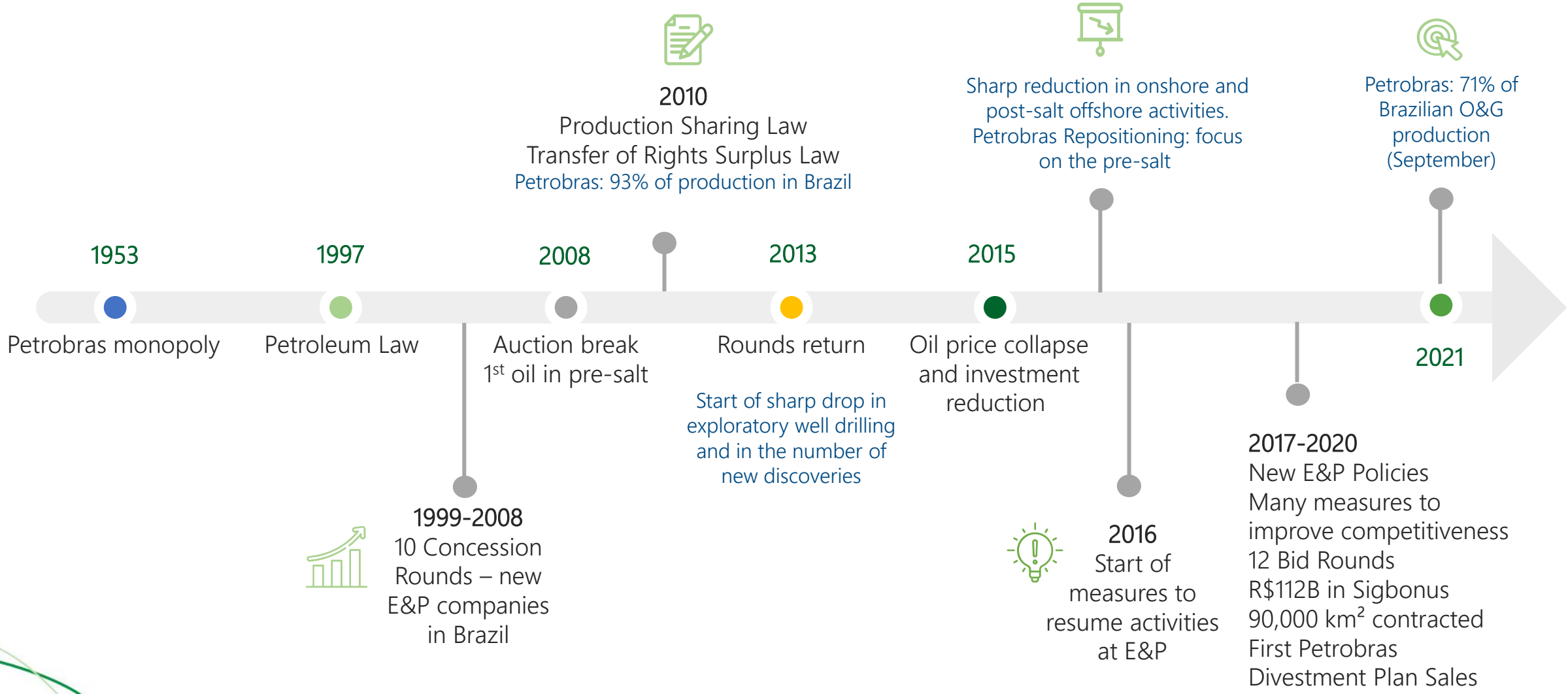
19,000+
Km of O&G pipelines

Investments Forecast by Origin



E&P history in Brazil

From a monopoly towards an open market



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

2017

A bidding round schedule
(CNPE Resolution nº 10/2017)

New Local Content Policies
(CNPE Resolution 07/2017)

New E&P Policies
(CNPE Resolution 17/2017)

Exploratory Phase Extension for 11th and 12th Rounds
(ANP Resolution nº 708/2017)

REPETRO Extension
(Law 13,586/2017)

2018

Local Content waivers
(ANP Resolution nº 726/2018)

Royalty reduction on the incremental production
(ANP Resolution nº 749/2018)

RBL and M&A made easier
(ANP Resolution nº 785/2019)

Mandatory investment or M&A in onshore and shallow water fields; deadline for Petrobras divestment
(RD nº 568/2018)

2019

A new type of auction:
Open Acreage

Unlocking the Transfer of Rights Auction

2020

Regulation of decommissioning
(ANP Resolution nº 817/2020)

ANP Resolutions:
Flexibility as a result of the pandemic

2021

Royalties reduction for S&M companies
(ANP Resolution nº 853/2021)

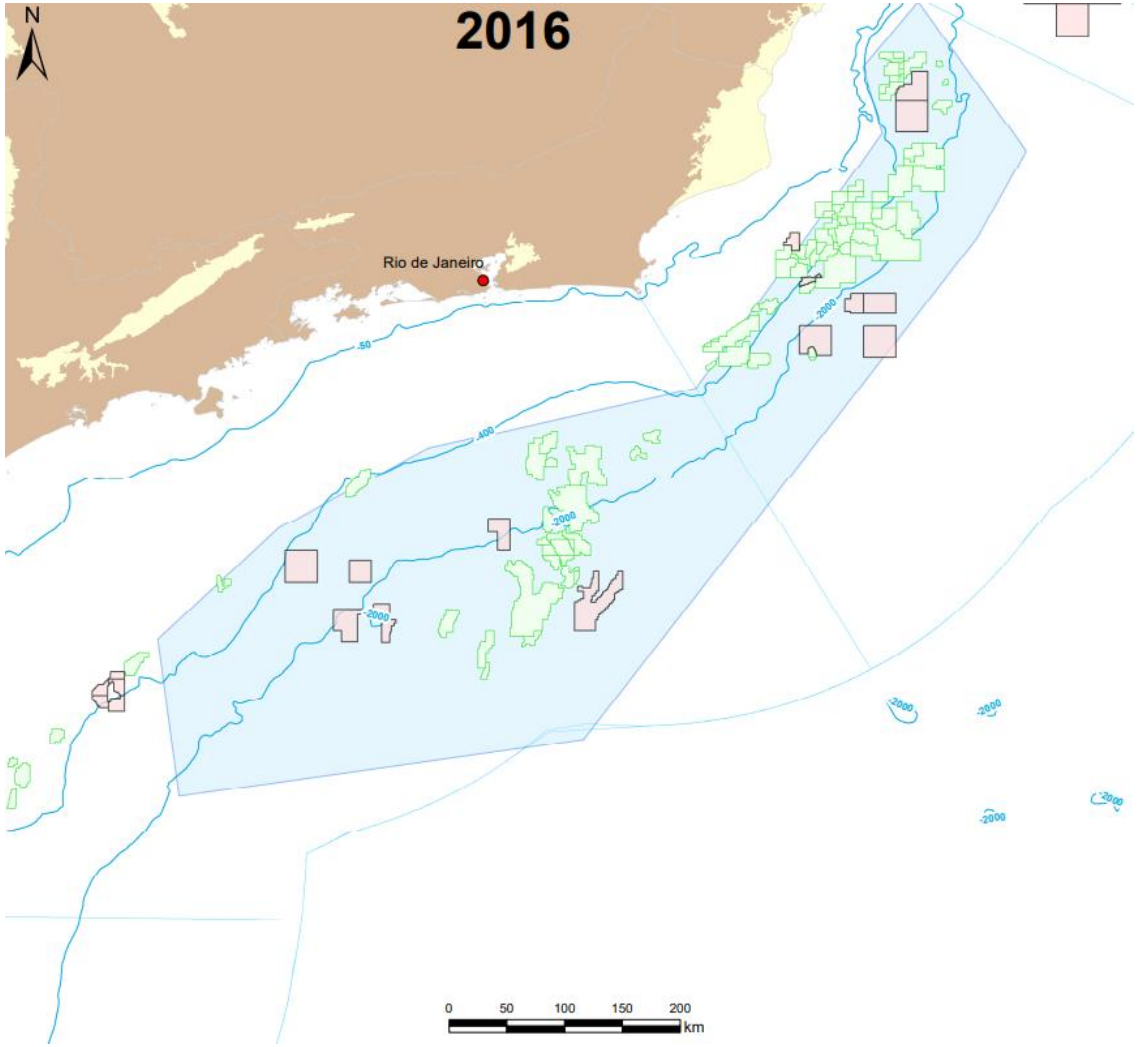
Adjustment Agreement to Local Content
(ANP Resolution nº 848/2021)

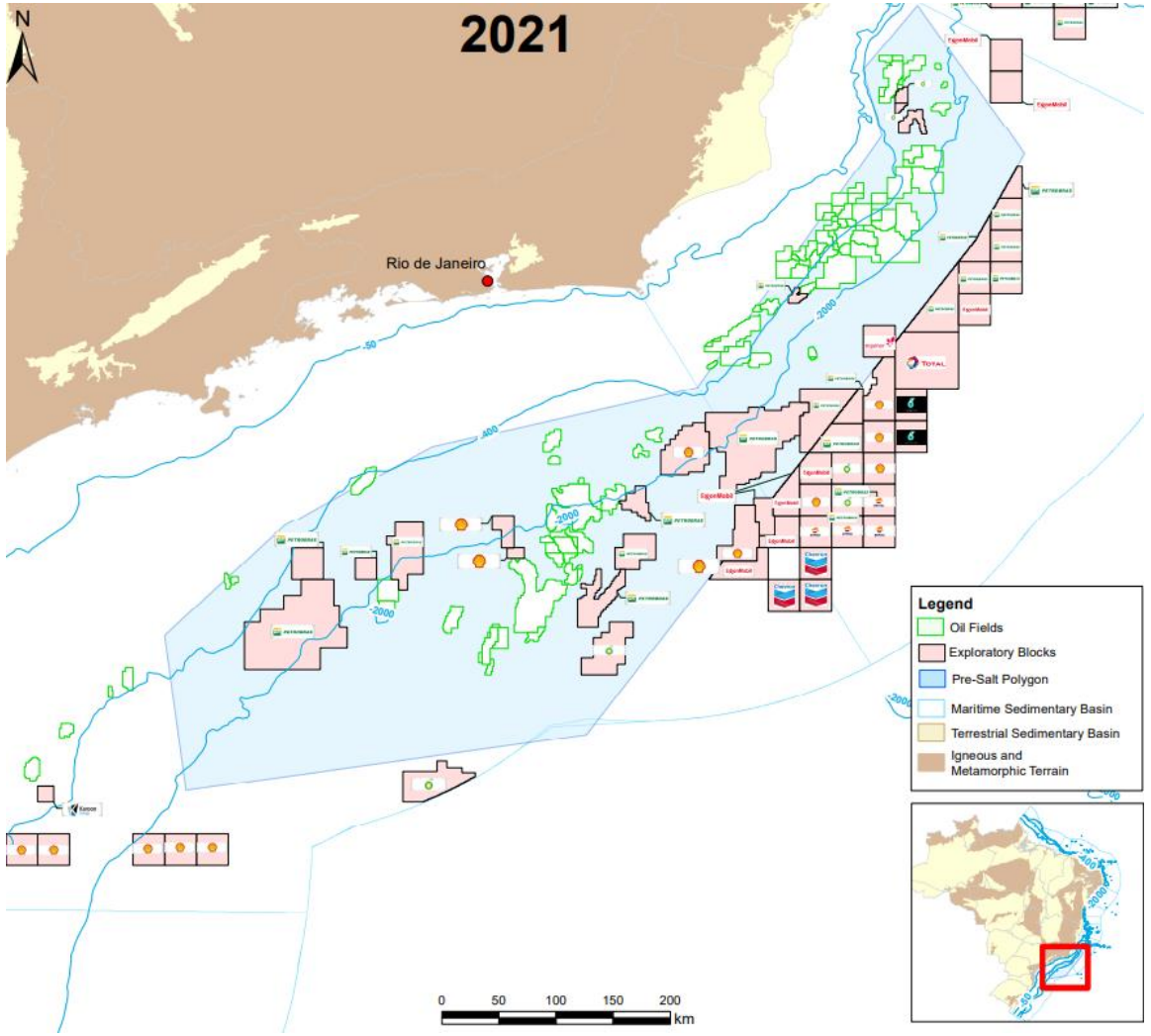
Area Nomination
(ANP Resolution 837/2021)

Decommissioning Guarantees
(ANP Resolution nº 854/2021)

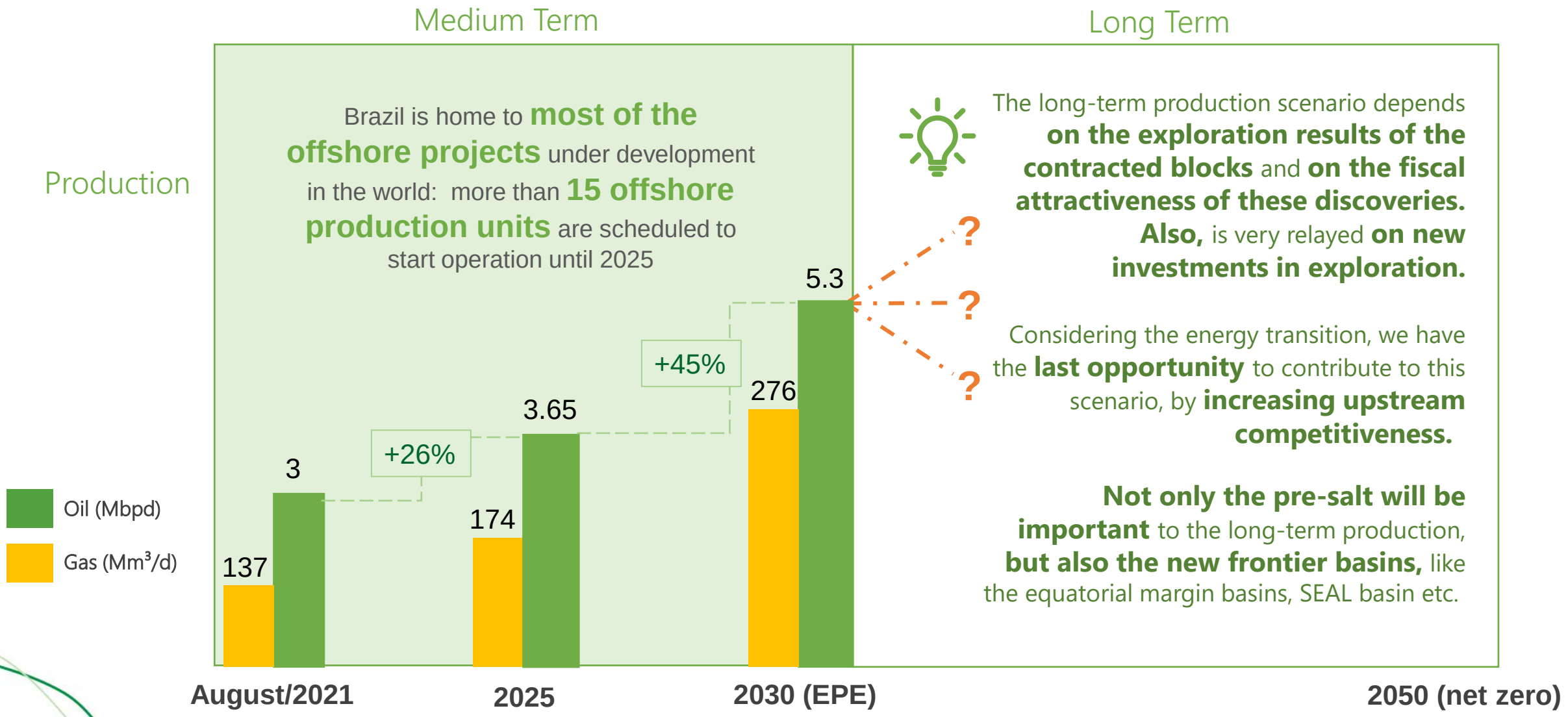
Bidding Rounds
(em 2017/2021)

Results from 2017 bidding rounds in Campos and Santos basins

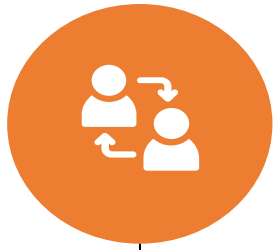




Brazil is poised to be one of the key sources of growth over the medium term, but still need to keep taking measures for the long term



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%
This represents an enormous opportunity in the **mature fields**.
Need to reduce OPEX and decommissioning costs

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

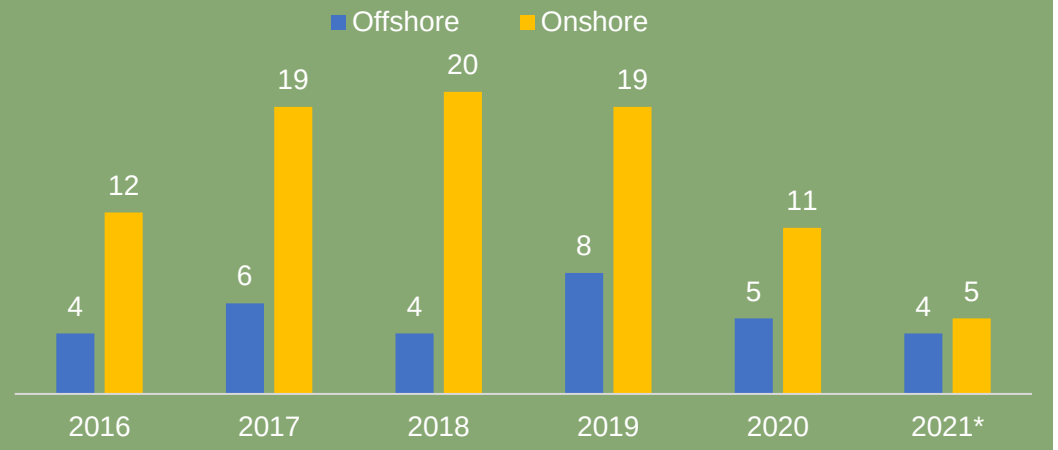
Exploration and Appraisal Activities

72% of the exploratory blocks operated by non-Petrobras companies

Exploratory Blocks

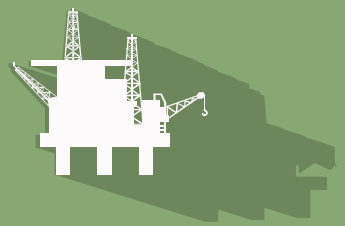
190,000 km² in exploratory areas

Exploratory Wells drilled

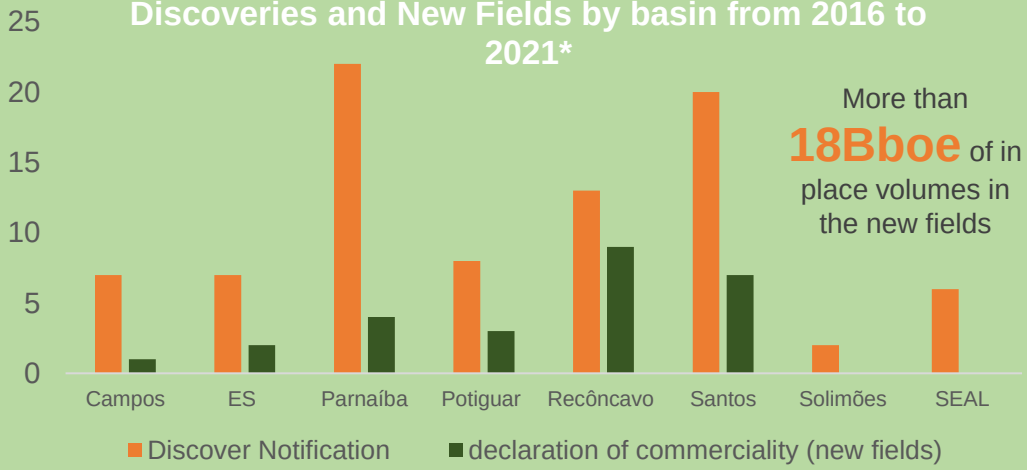


58% - Technical Success Rate

(2016 – 2020)



Discoveries and New Fields by basin from 2016 to 2021*



More than **18Bboe** of in place volumes in the new fields

*Until August 2021

Exploration activity was hit by pandemic

Extension of Exploratory Activities approved by ANP (9 months) and CNPE (more 18 months)

More than one billion dollars investment forecasted for 2021 (R$ 6.4B), but we are seeing up to date similar activity levels of 2020

Onshore Overview

- Exploratory activities concentrated in mature basins and gas prone basins (Parnaíba and Solimões)
- Discoveries and new fields onshore concentrated in Parnaíba and Recôncavo basins

Offshore Overview

- Focus on Campos and Santos basins (pre-salt)
- Discoveries and new fields offshore concentrated on Santos basin
- Decrease in exploration activities in offshore new frontiers

Offshore Highlights & Opportunities

PRE-SALT

Giant oil reserves **with lower costs and emission rates.** One well can produce more than 50,000 bpd of oil

Well (July/21)	Oil (bpd)	Gas (km³/d)
7-BUZ-10	**55,064**	**1,874**
7-BUZ-31D	**51,121**	**2,119**

IHS yet to be found resources estimates in the pre-salt: more than **50Bboe**

IHS Markit YTF resource estimates

Basin name	Play name	Total (billion boe)
Sergipe-Alagoas	Deepwater cretaceous(1)	6.92
Espirito Santo	Pre-salt	1.60
Campos	Post-salt(2)	1.26
	Pre-salt	18.00
Santos	Post-salt(2)	1.78
	Pre-salt	36.01

Note: (1) Estimated in 4th quarter of 2019; (2) Estimated in 1st quarter of 2020.

Source: IHS Markit

POST-SALT

All shallow water fields being divested, as well as some of the deepwater assets.

Independents, specialized in mature fields jumping into these opportunities.

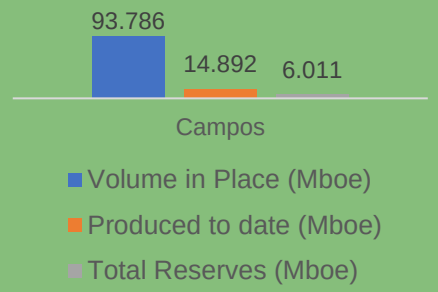
New operators are working on **reducing OPEX and decommissioning costs, revitalizing production facilities and implementing IOR opportunities** to leverage existing underutilized facilities

Investment commitment of **more than 1.5 billion dollars** in the new Development Plans presented for shallow water assets of Trident, Perenco and BW.

CAMPOS BASIN: home to most opportunities of improving RF

Since the first discover in 1974 (Garoupa Field), we have produced only **16% of the volume in place** and we estimate 22% of RF.

Each 1% more in Campos Basin RF representes almost **1 Bboe** of new oil.



Decarbonization in the upstream

01

Since 2009, O&G production operated by Petrobras (who operates more than 90% of the O&G production in Brazil) increased more than 40% without increasing absolute emissions. Also, Petrobras established several ESG commitments in the E&P like zero routine flaring by 2030, 32% reduction in carbon intensity and 30-50% reduction in methane emissions by 2025. Brazil has already a high produced gas utilization rate (more than 97,7% in Aug 2021).

10 Sustainability Commitments

PETROBRAS

CLIMATE
1. Zero growth in absolute operating emissions until 2025
2. Zero routine flaring by 2030

WATER
3. ~40 MM ton CO_2 reinjection in CCUS (*Carbon Capture, Utilization and Storage*) projects
4. 32% reduction in carbon intensity in the E&P segment by 2025, reaching 15 $kgCO_2e/boe$

WASTE
5. 30%-50% reduction in methane emission intensity in the E&P segment by 2025
6. 16% reduction in carbon intensity in the refining segment by 2025, reaching 36 $kgCO_2e/CWT$

BIODIVERSITY
7. 30% reduction in freshwater capture in our operations with focus on incresing reuse by 2025
8. Zero increase in waste generation by 2025
9. 100% of Petrobras facilities with a biodiversity action plan by 2025

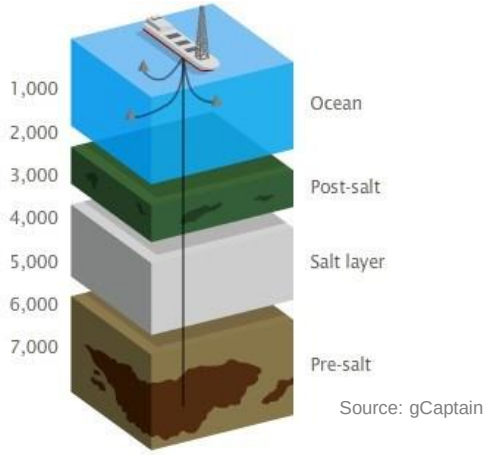
SOCIAL RESPONSABILITY
10. Investments in environmental and social projects

*Note: Carbon commitments related to 2015 base. Other commitments based on 2018.

2

Source: Petrobras (ESG Presentation, Oct 2020)

02



Source: gCaptain

Pre-Salt: globally competitive assets in the energy transition scenario, with low breakeven and low GHG emissions

- Low sulfur content
- High productivity

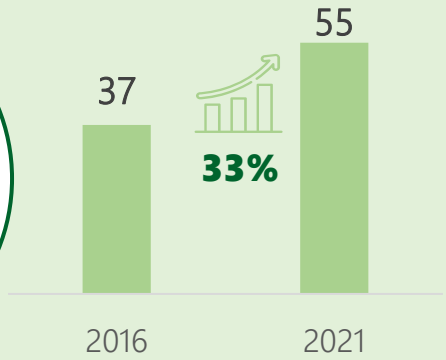
Bacalhau oil discovery, to be operated by Equinor, is expected to produce about 9 kg of carbon dioxide (CO2) per barrel, against a global average of more than 17 kg per barrel.

Source: Reuters

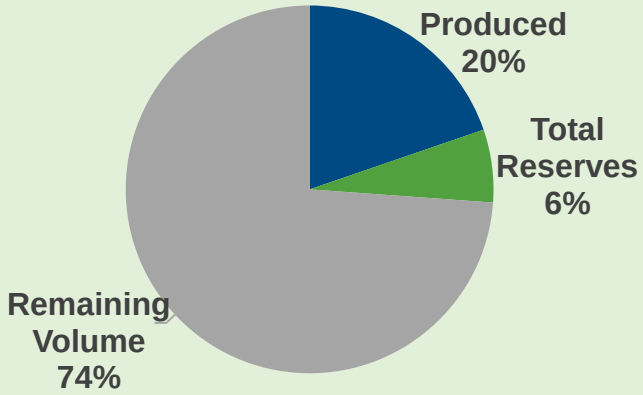
Also, a new onshore market is being set up

A new onshore market with small and medium companies is being established with Petrobras Divestment Plan, supported by foreign and national investors

Onshore E&P Groups in Brazil



Recovery Factor in Brazil



Key Messages

All onshore fields are being sold by Petrobras

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

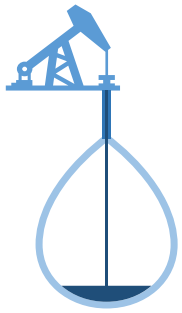
New operators are increasing production

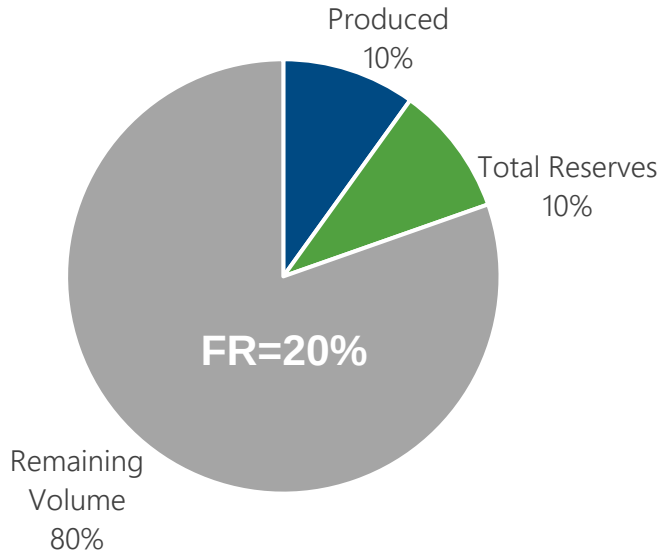
Huge investment opportunities in mature fields (IOR/EOR). 1% more in the onshore RF means 200Mboe

What we have already produced and our potential

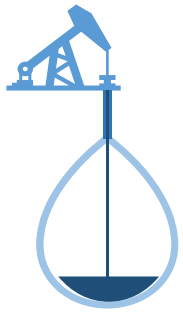
Brazil has produced only 10% of the volumes discovered in fields
World average RF: 35%

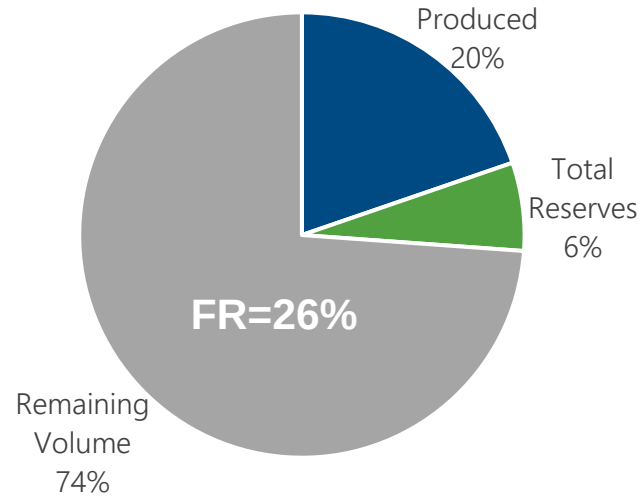
Brazil





Onshore





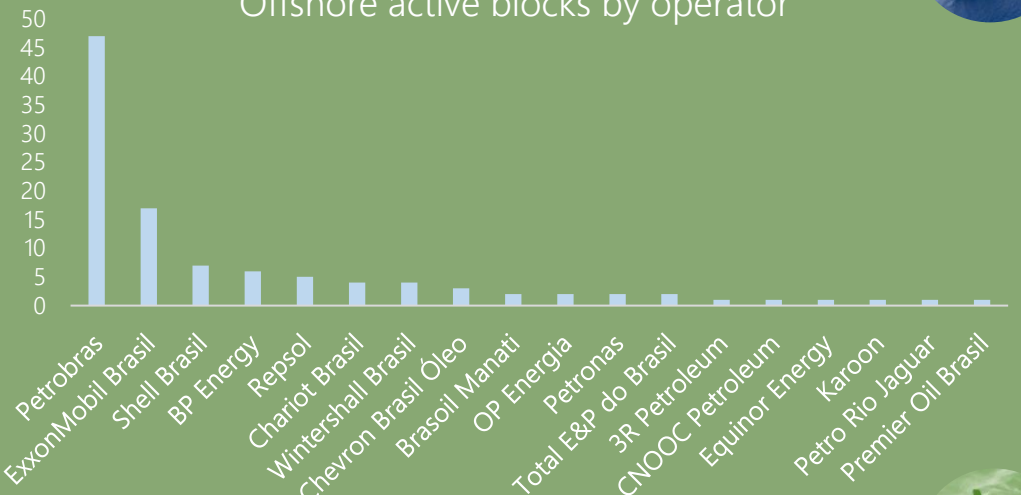
	Brazil	Campos Basin	Onshore
1% more in the RF	2.4Bboe	1Bboe	200Mboe

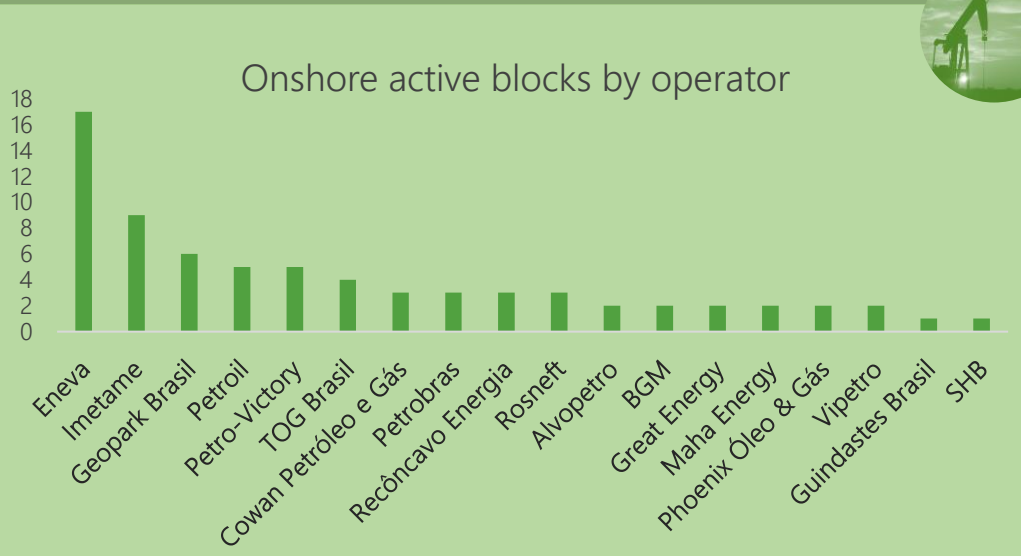
Increasing the RF is an energy policy goal and must be pursued by all agents as per best practices

Source: Annual Reserves Bulletin 12/31/2020 (Oil and Gas)

We have the main E&P players in Brazil

Exploratory Phase





Production Phase (Production by company in Sep/21)

Ranking	Company	Production (boe/d)	Ranking	Company	Production (boe/d)
1	Petrobras	2.739.898	28	Dommo Energia	1.215
2	Shell Brasil	464.999	29	3R Rio Ventura S.A	1.076
3	Petrogal Brasil	137.847	30	Duna Energia	472
4	Repsol Sinopec	89.955	31	3R Pescada LTDA	390
5	TotalEnergies EP	63.192	32	Petrosynergy	360
6	Eneva	51.744	33	SHB	353
7	Petronas	42.929	34	Imetame Lagoa Parda	349
8	Equinor Energy	41.001	35	Petroborn	231
9	CNODC Brasil	26.216	36	Nova Petróleo	207
10	CNOOC Petroleum	26.216	37	Origem	183
11	Trident Energy	23.901	38	Geopar - Geosol	128
12	Enauta Energia	23.370	39	BGM	123
13	Petro Rio Jaguar	14.534	40	Recôncavo E&P	108
14	Karoon Brasil	14.037	41	Slim Drilling	86
15	Petro Rio O&G	13.198	42	Partex Brasil	83
16	ONGC Campos	10.362	43	Petrom	73
17	Potiguar E&P S.A.	8.845	44	Energizzi Energias	73
18	QP Brasil	8.827	45	Phoenix Óleo & Gás	50
19	Chevron Brasil	7.189	46	Petro-Victory	24
20	Perenco Brasil	6.437	47	Ubuntu Engenharia	13
21	3R MACAU S.A.	5.654	48	Vipetro	13
22	PetroRio	3.247	49	Oeste de Canoas	12
23	Maha Energy	3.070	50	NTF	10
24	Alvopetro	2.150	51	Newo	10
25	Brasoil Manati	1.763	52	Sonangol Guanambi	9
26	Geopark Brasil	1.763	53	Guto & Cacal	8
27	Imetame	1.675	54	EPG Brasil	6
			55	Perícia	5
			56	Nord	1

Ongoing measures to attract investments

KEEP OFFERING AREAS

2nd ToR Surplus Open Acreage
+
Ongoing Petrobras Divestment Plan
(Only in 2021 US$5.6 billion was sold in assets up to 3QR/2021)

ONSHORE DATA AVAILABLE FOR FREE

Download:
Reate.cprm.gov.br/anp

Studies in progress to also public offshore data

MARGINAL FIELD DEFINITION

Draft under public consultation. Specific incentives should be discussed afterwards

ROYALTIES REDUCTION FOR SMALL AND MEDIUM COMPANIES

New ANP Resolution approved by ANP

Already implemented: royalties reduction for incremental production

OTHER REGULATORY MEASURES TO REDUCE ABOVE GROUND RISKS AND IMPROVE FISCAL TERMS

Measures under REATE, PROMAR and BIDSIM programs, including studies to improve environmental licensing process and competitiveness of marginal discoveries

Also, the new gas law was a decisive step towards a competitive gas market, with great opportunities

Opportunities in the 2nd ToR Surplus Round

TRANSFER OF RIGHTS SURPLUS Brazil PRODUCTION SHARE

SÉPIA

Pre-salt field
157km²

In Place Volume:
5.3 Bbbl oil
124 Bm³ gas

Signature Bonus:
R$7.138 billion

Minimum Profit Share:
15,02%

Prod Sep/21 (FPSO **Carioca**):
Oil: 44 Kbpd
Gas: 1 Mm³/d

ATAPU

Pre-salt field
229km²

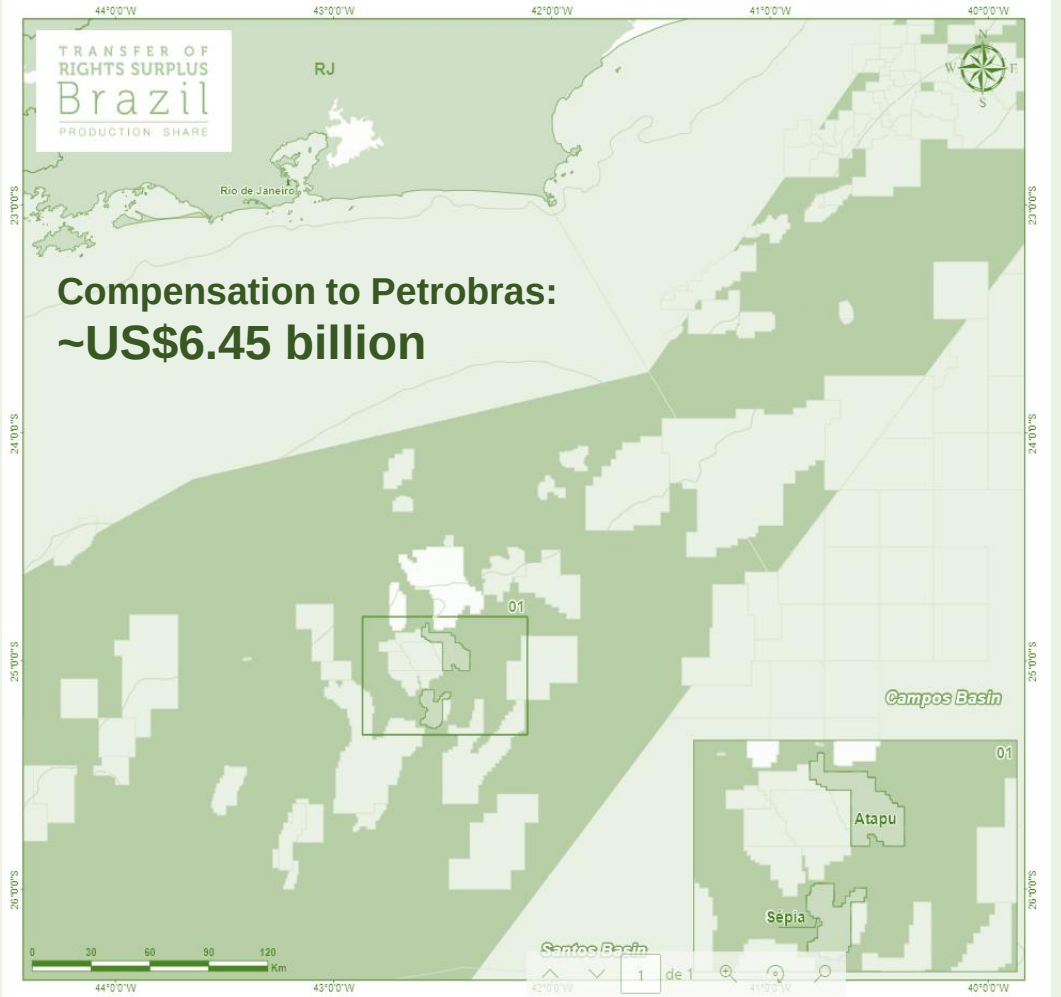
In Place Volume:
7.2 Bbbl oil
179 Bm³ gas

Signature Bonus:
R$4,002 billion

Minimum Profit Share:
5,89%

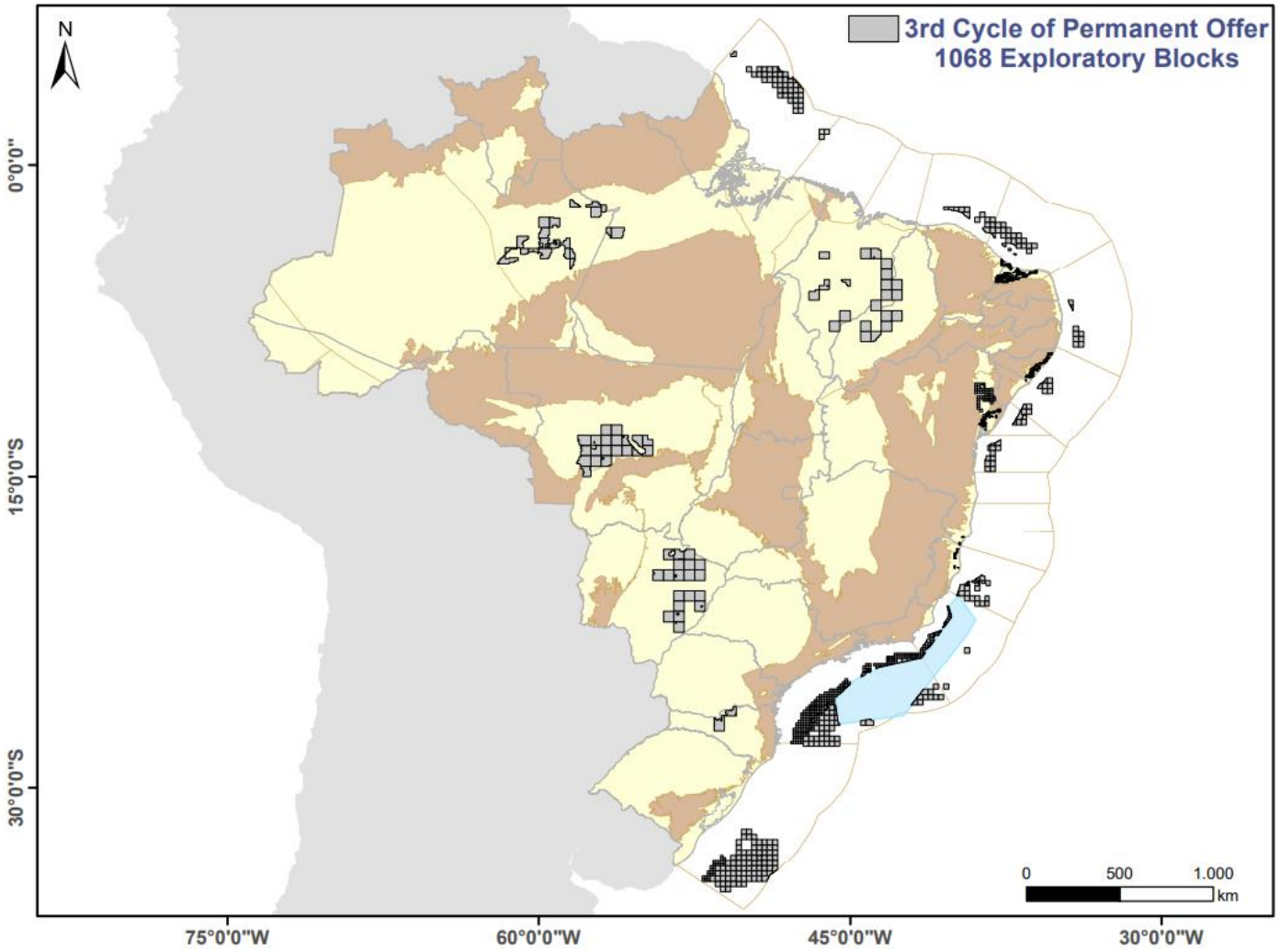
Prod Sep/21 (P-70):
Oil: 132 Kbpd
Gas: 4.5 Mm³/d

Auction: December 17th



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



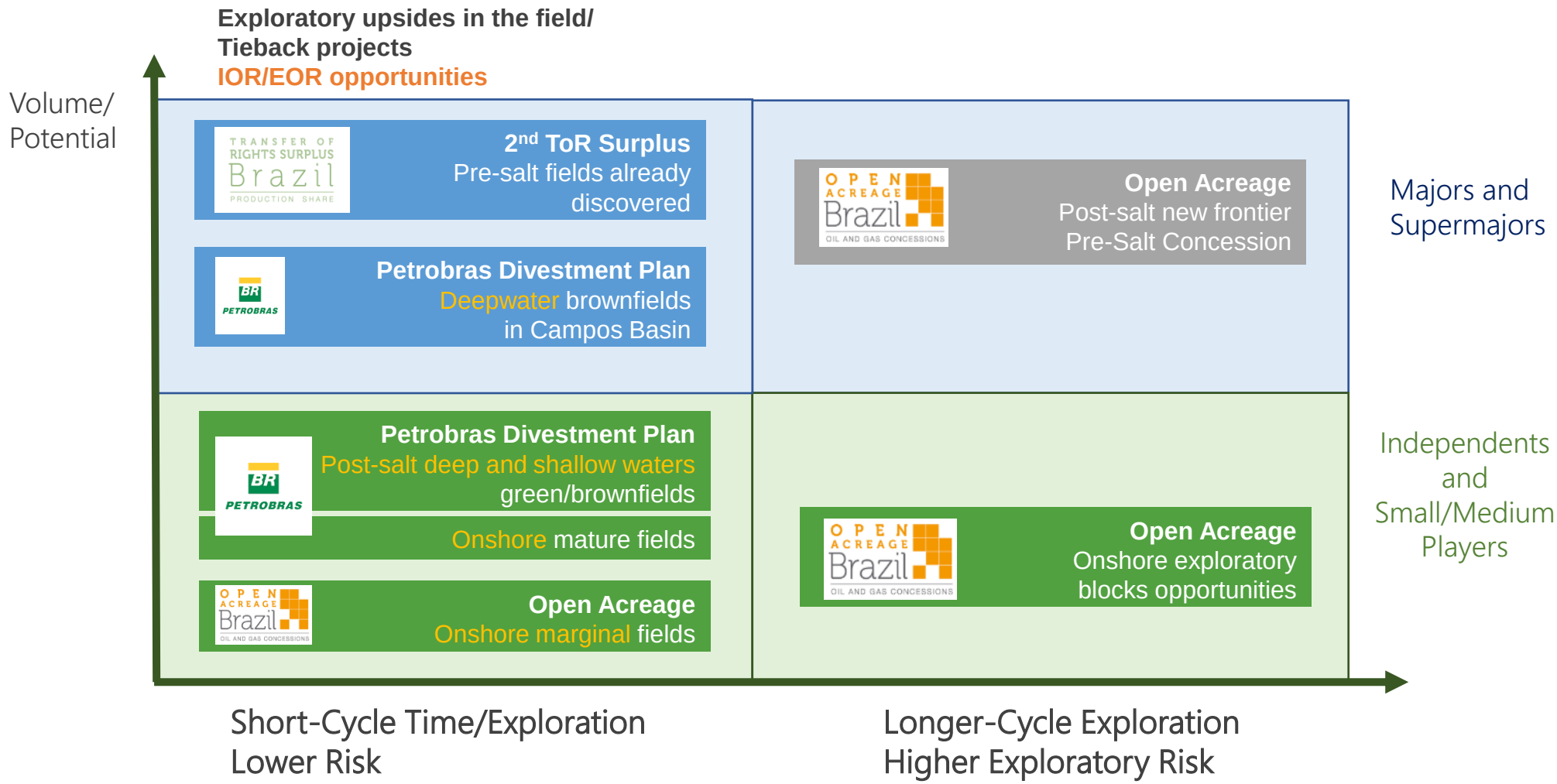
1,068 blocks already available for the 3rd cycle

=

Additional **350 blocks** and **11 marginal fields** under study to be added in the future

E&P Opportunities attractiveness in a post pandemic world

Brazil has strong opportunities for low and high-risk investors.
Greater attractiveness for shorter cycle return projects.



#3

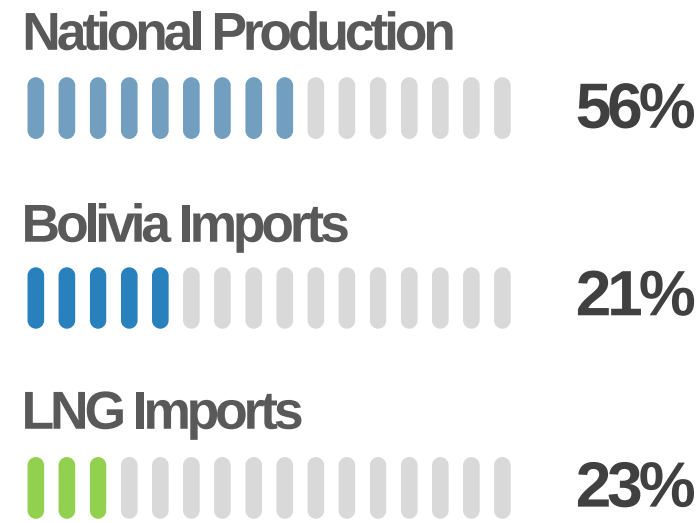
The Natural Gas Market

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

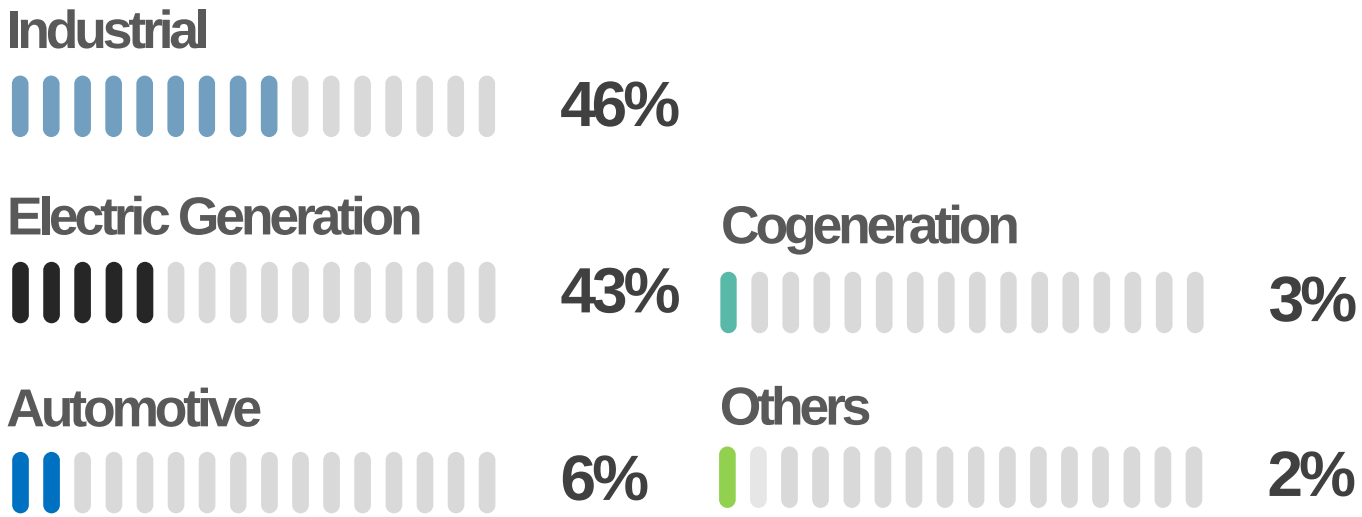
SUPPLY

93 Million m³/d



DEMAND

89 Million m³/d



*Jan-Jul 2021 (Average)

The natural gas infrastructure

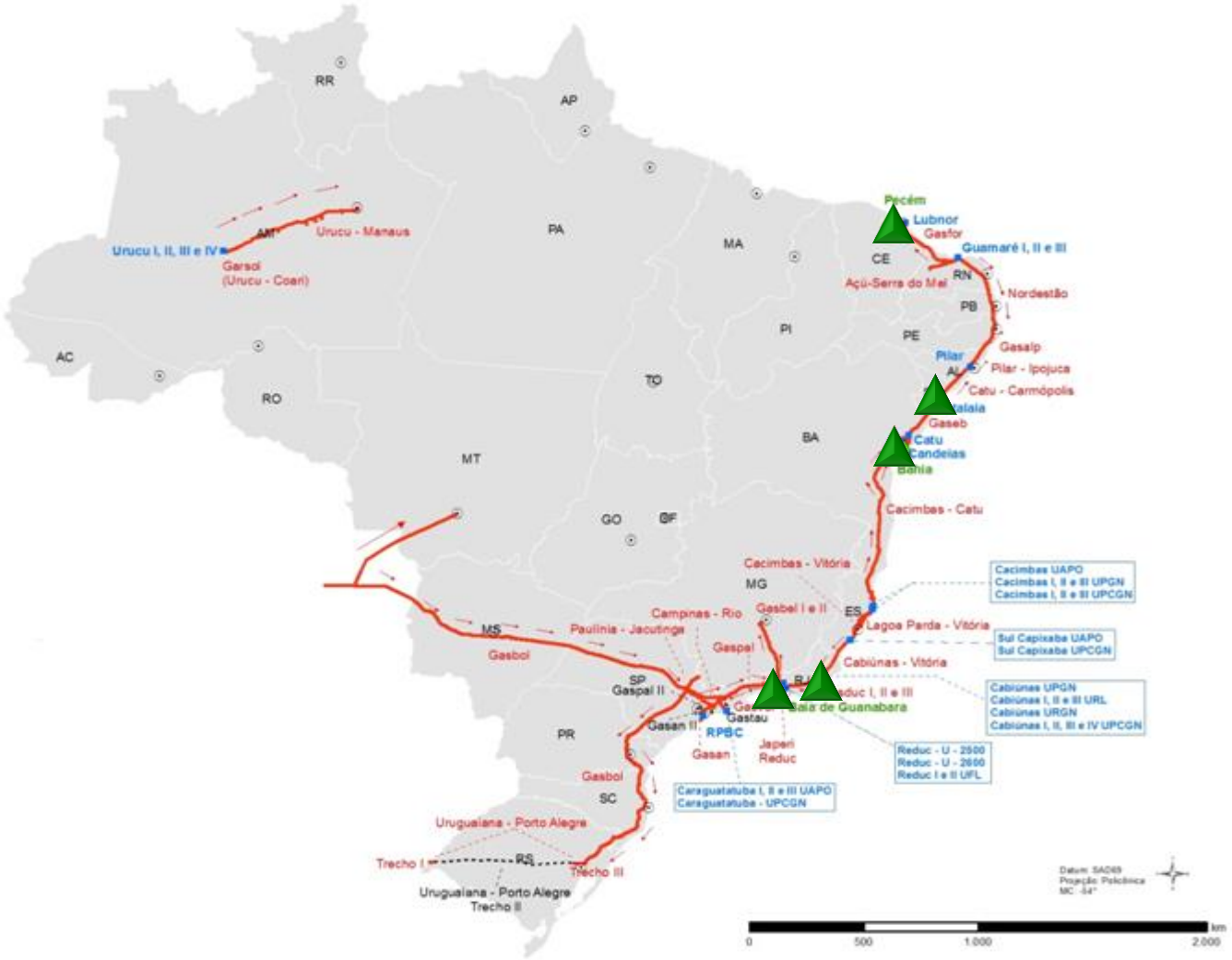
Current infrastructure is limited for such a large country

9,406
km of transmission gas pipelines

2,246
km of transfer gas pipelines

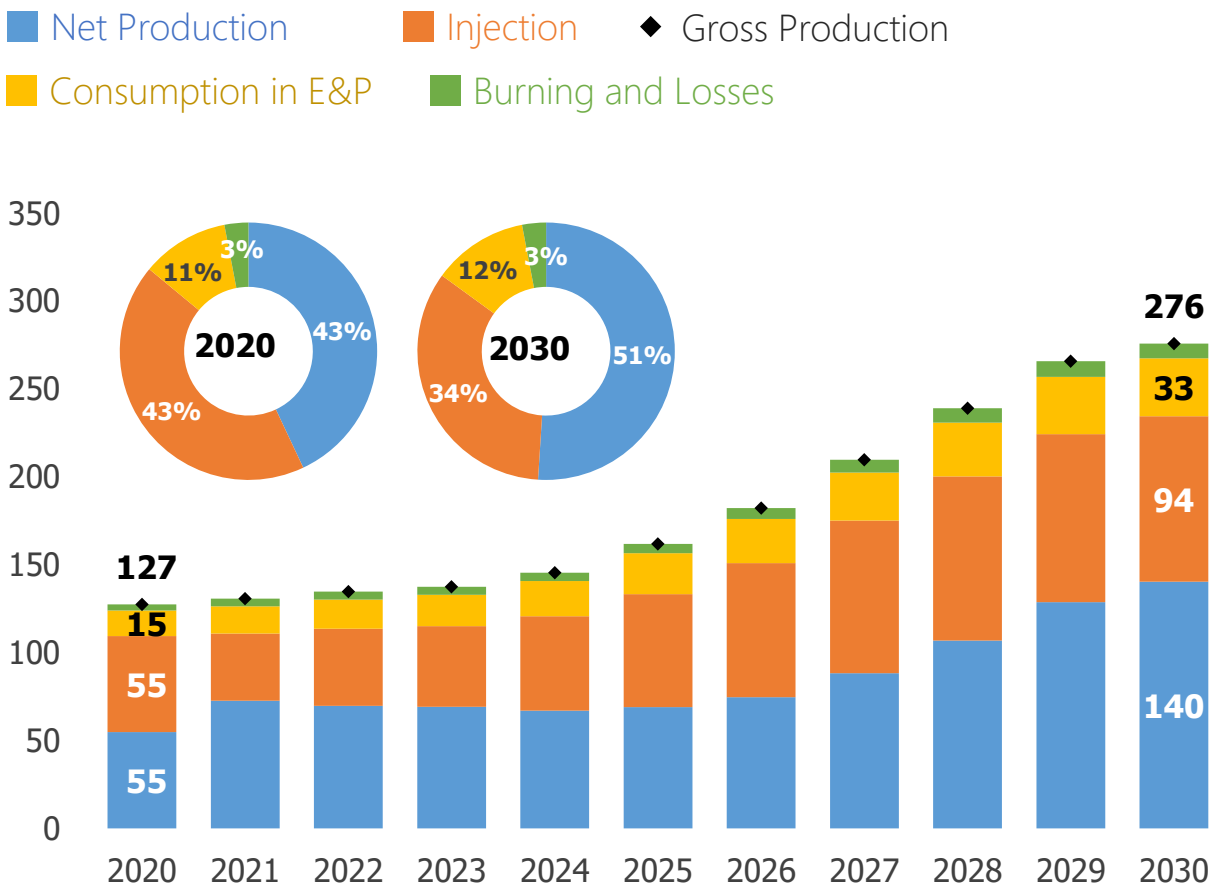
15
NG processing plants
Capacity: **108** Million m³/d

5
LNG Terminals
Capacity: **99** Million m³/d



Source: ANP Statistical Yearbook (2020)

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



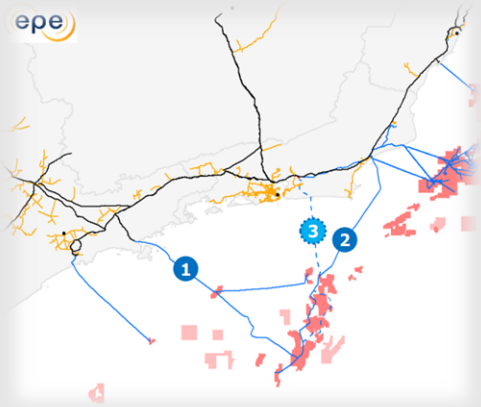
Source: EPE PDE 2030

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

EPE expects the pre-salt liquid gas production reach more than **70 million m³/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 m³/d



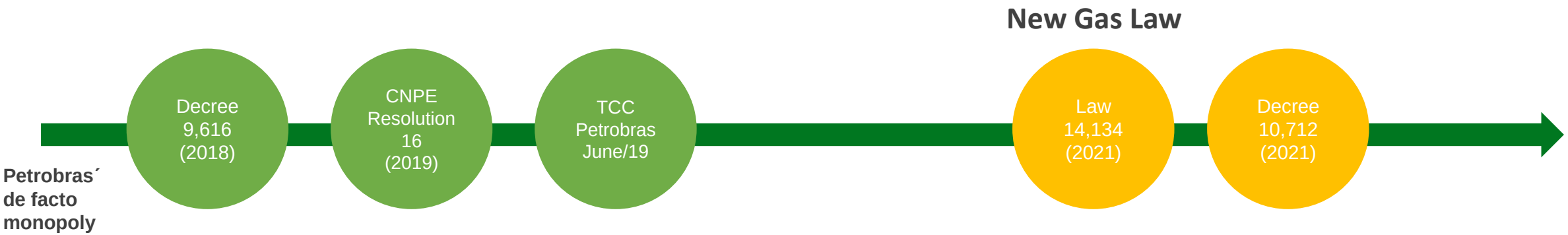
There is also plenty of opportunities to increase national gas production in the onshore

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

Most of the onshore exploration in new frontier basins is to produce gas. Open Acreage and Petrobras Divestment Plan can untap more gas opportunities.

Reservoir to Wire Model: Competitive production costs. Relevant projects in Parnaiba and Amazonas Basins

Brazil is moving towards a competitive gas market



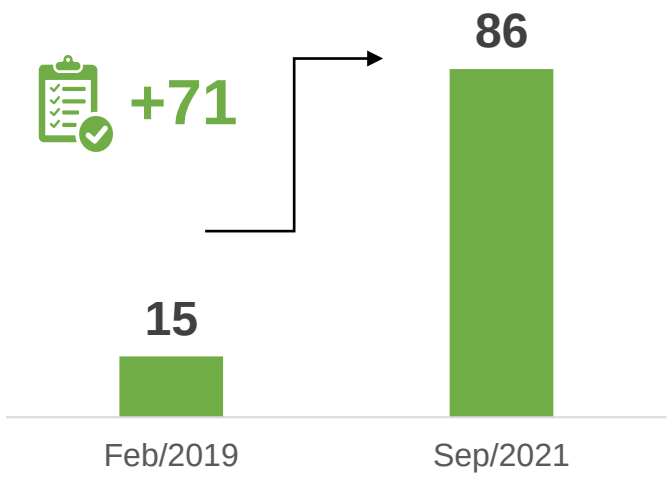
- *Improve NG market competition*
- *Entry-exit model*
- *Integrate gas sector with power sector*
- *Regulatory Harmonization (Federal & States)*

- *Sell all equities in transportation and distribution markets*
- *Non-discriminatory access to essential facilities.*
- *Decline exclusivity of current gas transportation agreement*
- *Cannot contract new gas volumes*

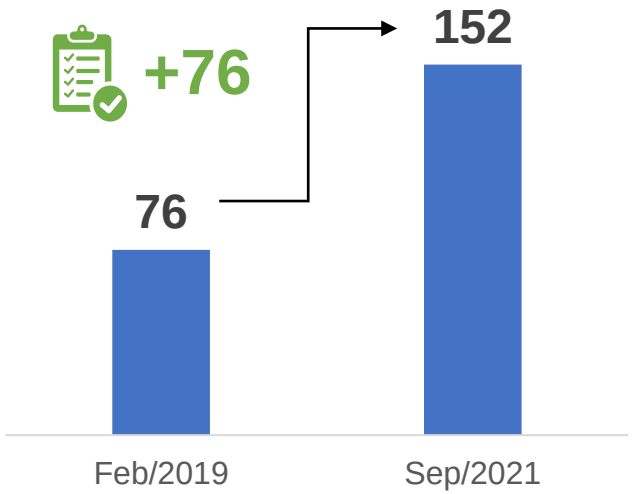
- *Authorization scheme for gas transport and storage activities*
- *Integrated gas transport system; Independent and coordinated system operation; entry-exit model*
- *Non-discriminatory access to essential facilities.*
- *Gas to gas competition.*

And the interest in the Brazilian gas market is increasing

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



Shipping of Natural Gas by Pipelines



Commercialization of Natural Gas

55 new authorizations granted between Jan/2019 and Sep/2021 (20 of which after New Gas Law was published)

Import of Natural Gas

Main regulatory challenges in the new gas market

Lack of competitive forces

More suppliers, carriers and free consumers are needed

Lack of third-party access

Essential Facilities Doctrine

Lack of market driven gas price mechanisms

Trade hubs and exchanges

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 3rd Party Access (Multi study group dedicated to this subject)

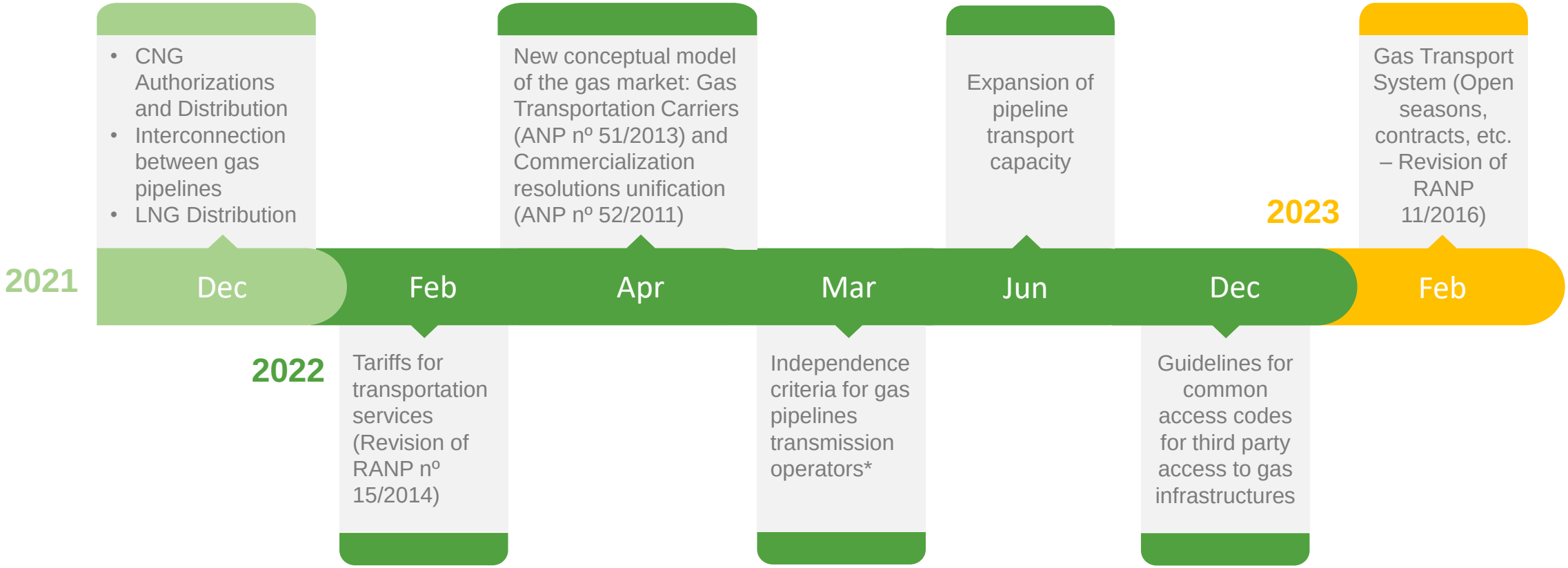
Open seasons are being conducted considering 1 year contracts

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 25th 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)

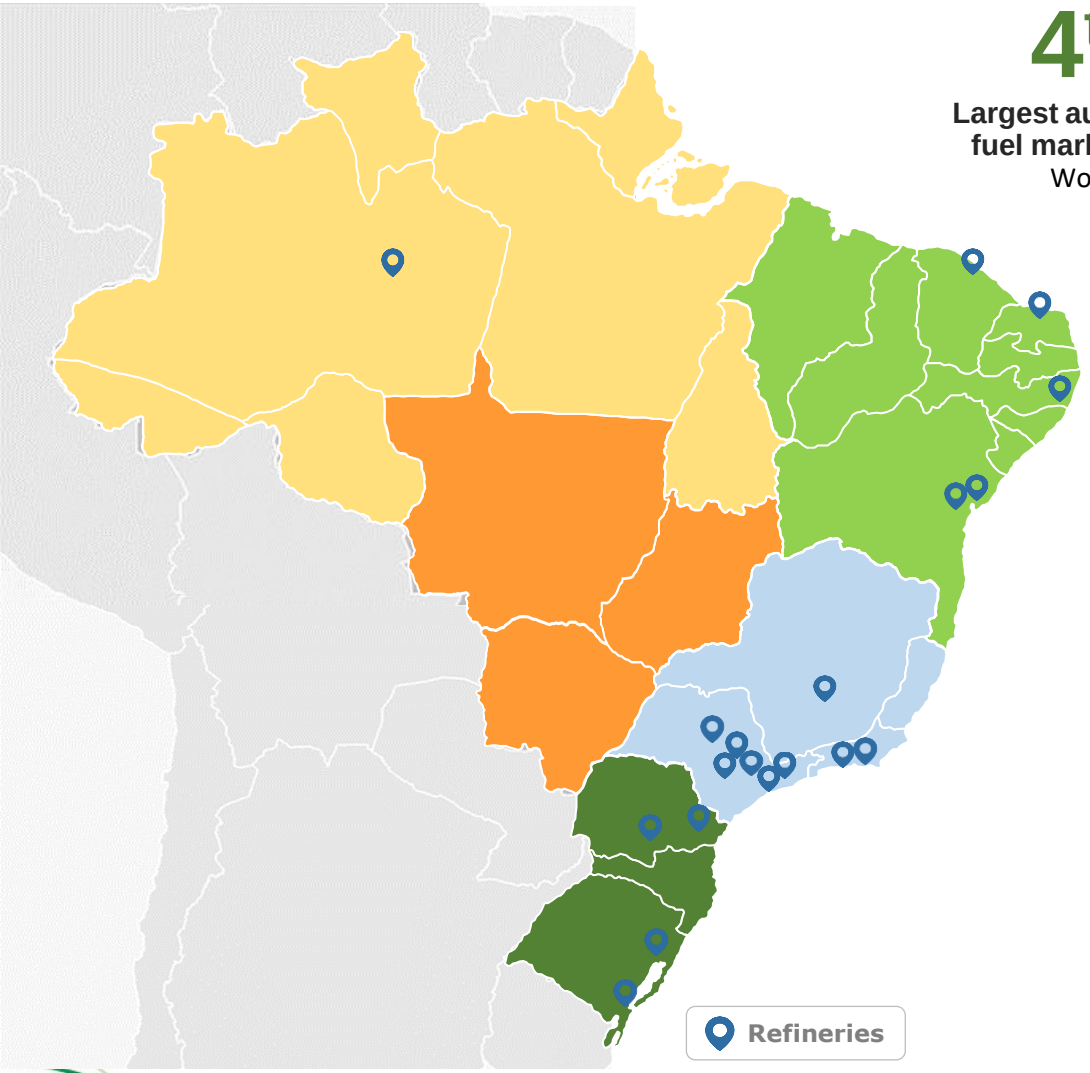
03 National gas production expected to almost double until 2030, with a variety of suppliers

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

#4

The Downstream Market

The downstream market



4th

Largest automotive fuel market in the World

19
Refineries

2.4
Million bpd
Refining Capacity

9th
Largest Refinery Capacity
(MME 2021)

634
Importers & Exporters

244
Fuels Distributors
(164 Liquid Fuels
20 LPG
20 Solvents
32 Asphalt
8 Aviation Fuels)

124,240
Retailers and regulated customers

167
Lubricant Producers and Re-refiners

Petrobras Divestment Plan

Downstream assets for sale

Units
8

Refining Capacity
1.1 million b/d

Share of Brazil's refining capacity
48%

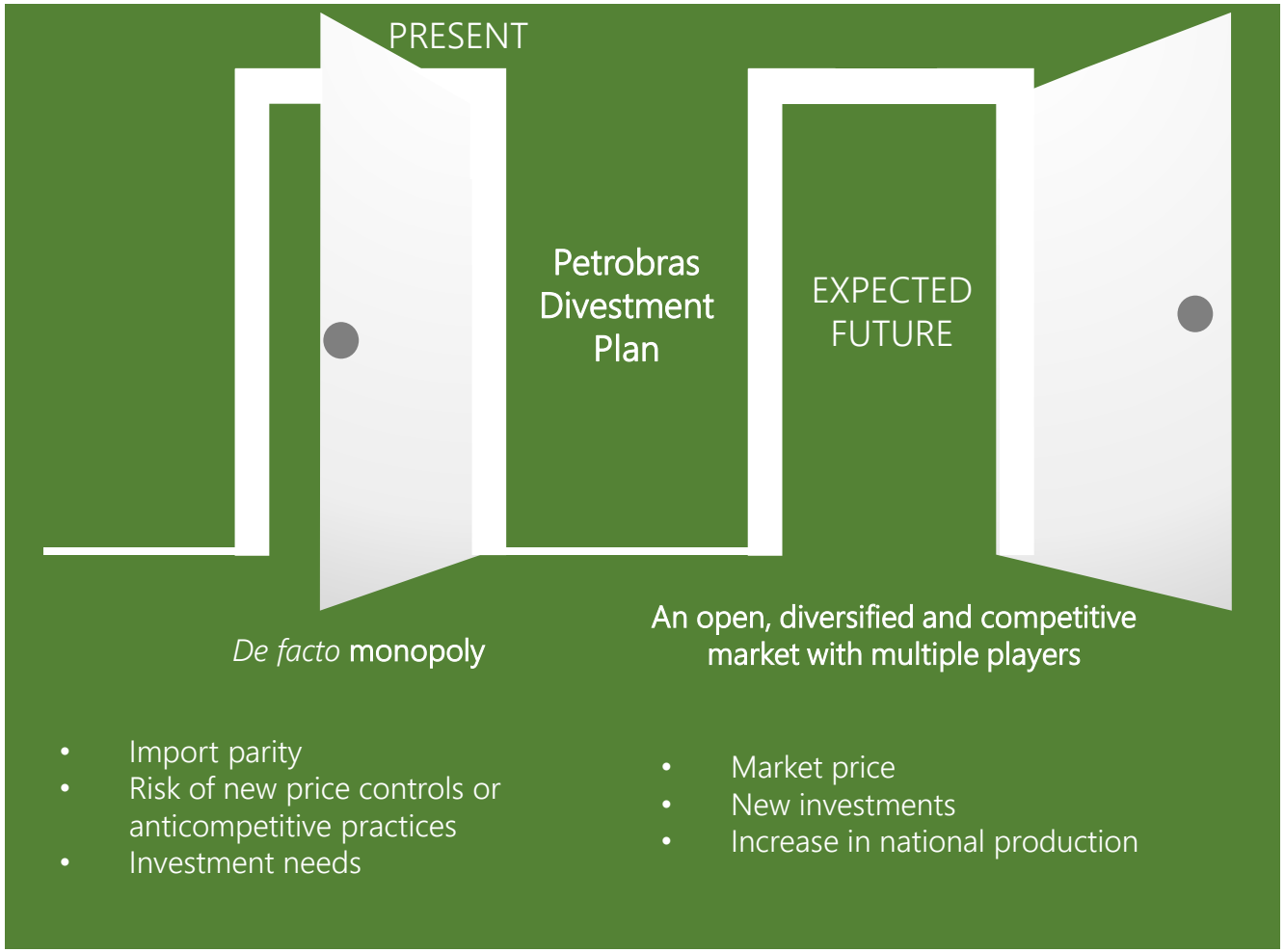
Units Sold – 16% capacity

RLAM – Mubadala ($1,65 billion)

SIX - F&M Resources ($ 33 million)

REMAN – Ream Participações – Atem ($189,5 milhões)

The greatest transformation



Divestment will contribute to diversify the supply and to **increase competition** in the downstream sector

The role of ANP is to work in the transition with an emphasis on **guaranteeing supply** and improving the regulation to foster an open and competitive market

In addition, ANP is working to better **monitor the oil products stocks and to ensure transparency on the prices**

There is also a huge regulatory agenda to increase competitiveness in the wholesale and resale sectors

The market is rebounding in 2021

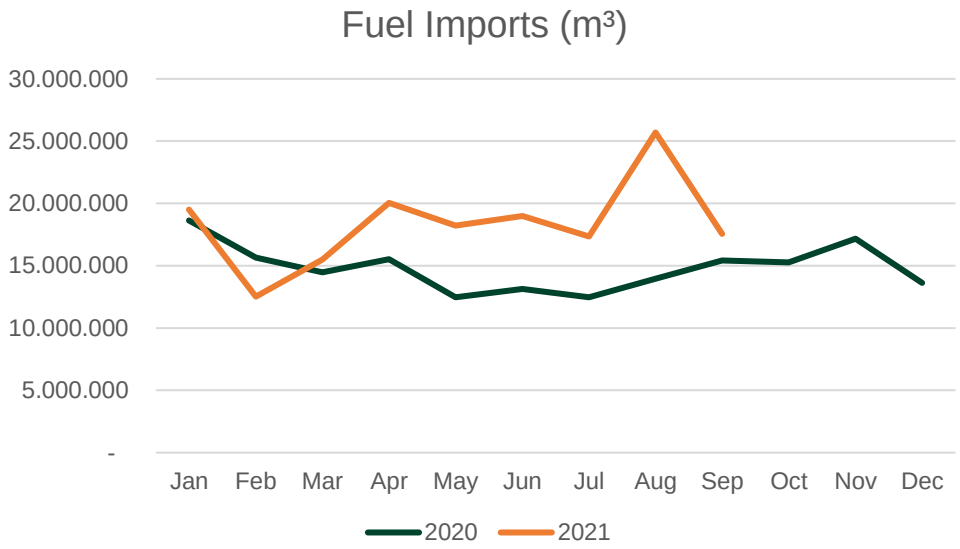
Distributors Fuel Sales by product

	Gasoline	Diesel	LPG	QAV	Fuel Oil
jan/20	3.167.240	4.432.971	1.032.877	647.000	154.470
fev/20	3.083.981	4.514.232	1.014.288	562.263	139.346
mar/20	2.697.025	4.710.564	1.177.628	426.024	153.135
abr/20	2.286.485	4.004.817	1.129.284	84.564	156.795
mai/20	2.499.362	4.360.350	1.099.207	102.919	163.124
jun/20	2.722.475	4.696.043	1.167.510	128.004	128.040
jul/20	2.981.552	5.231.146	1.244.132	164.666	141.348
ago/20	2.933.073	5.164.422	1.196.802	195.709	144.915
set/20	3.127.219	5.237.176	1.138.969	230.503	115.833
out/20	3.390.765	5.537.466	1.154.521	295.182	198.446
nov/20	3.217.673	4.900.948	1.084.704	321.747	277.973
dez/20	3.716.766	4.681.920	1.166.877	387.491	245.764
jan/21	3.181.268	4.523.979	1.055.299	405.207	288.594
fev/21	2.770.213	4.440.587	1.006.428	309.499	189.131
mar/21	2.820.835	5.496.933	1.163.805	296.041	187.009
abr/21	2.738.589	5.086.225	1.100.339	239.777	161.051
mai/21	3.089.119	5.022.328	1.122.577	290.146	170.130
jun/21	3.196.373	5.116.206	1.193.272	311.438	340.152
jul/21	3.515.092	5.617.666	1.239.809	384.343	351.507
ago/21	3.426.505	5.727.465	1.186.843	378.545	388.169
set/21	3.490.412	5.414.301	1.101.742	388.895	402.571

Fuel Sales in maximum levels in the last 5 years

Brazil still needs a lot of fuel imports

We export crude oil and import oil products, creating opportunities in the refining market

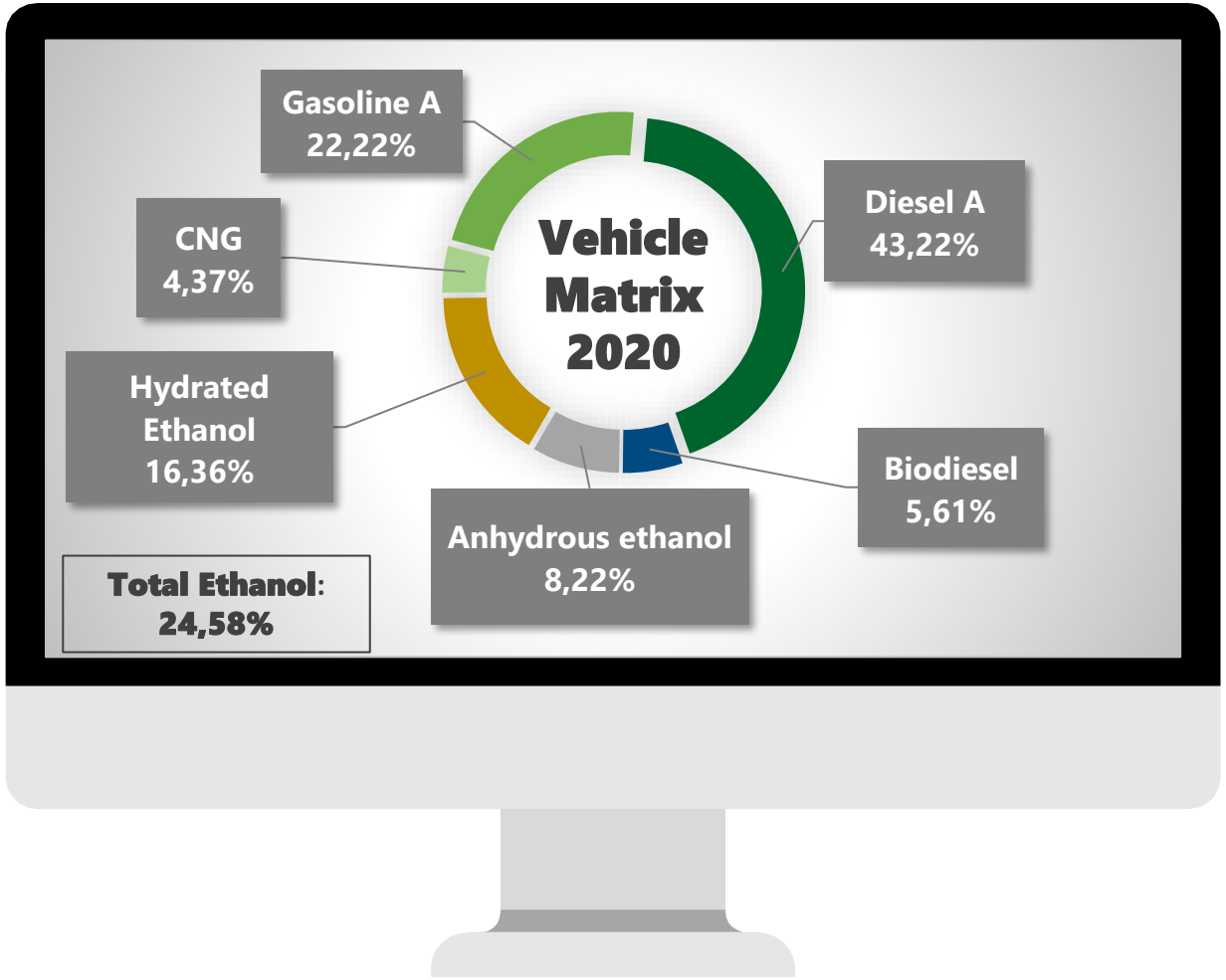


Import / sales (2020 average):

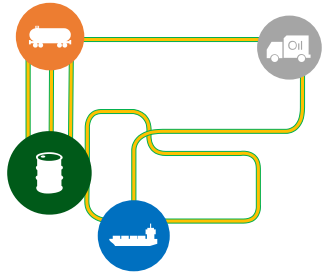
GASOLINE A	DIESEL A	LPG	JetFuel
15%	24%	27%	9%

The Vehicle Matrix in Brazil

Brazilian vehicle matrix with relevant participation of biofuels: 30%



We lack investments in fuel infrastructure



Oil Products and Biofuels (except LPG)

	Terminals and Distribution Bases	
	Capacity (m³)	Capacity in days
MIDWEST	653.024	15
NORTHEAST	3.125.816	47
NORTH	957.528	32
SOUTHEAST	6.534.856	38
SOUTH	2.439.657	35
TOTAL	13.710.882	35,7

LPG

	Terminals and Distribution Bases	
	Capacity (m³)	Capacity in days
MIDWEST	37.342	12
NORTHEAST	85.182	10
NORTH	49.783	22
SOUTHEAST	316.066	20
SOUTH	43.572	7
TOTAL	531.945	14,7

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

Pipelines	Type	Km
Oil Products	Transfer	1,353
Oil Products	Transport	4,412
Ethanol	Transfer	17
Ethanol	Transport	369

Opportunities in the downstream sector

01 Petrobras Divestment Plan (CADE agreement) – brownfields opportunities to increase national supply / Greater competition in the downstream market

02 One of the largest fuel market in the world – demand will increase

03 Logistics costs – Oil products import and crude oil exports

04 Investment opportunities in infrastructure

#5

The Biofuels market

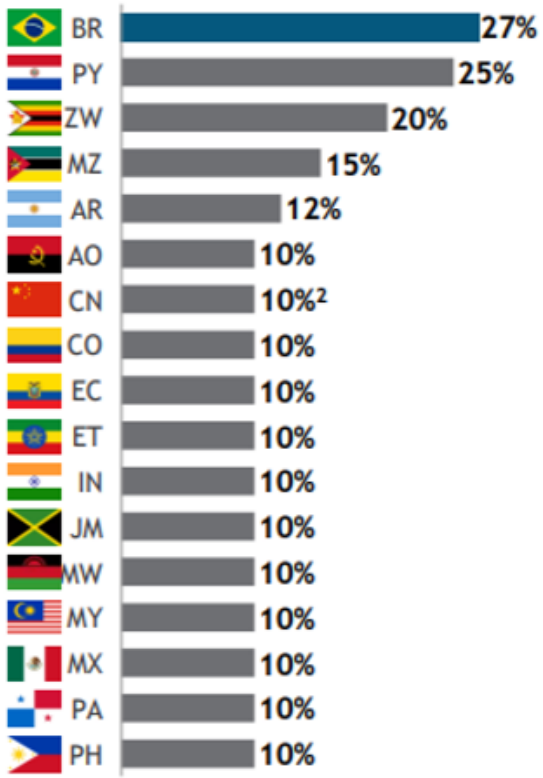
The biofuels market

Brazil has large experience in producing biofuels and is already a global leader in the use of biofuels
We are the 2nd largest producer and consumer in the world

Ethanol		**357** **Ethanol Mills** (+ 51 being expanded + 23 under construction)	**377k** **m³/d of capacity** (+ 7% increase under construction)	**33M** **m³ of ethanol production** (2020)
Biodiesel		**52** **Biodiesel Plants** (+ 3 being expanded + 13 under construction)	**33k** **m³/d of capacity** (+ 22% under construction)	**7M** **m³ of biodiesel production** (2020)
Biomethane		**4** **Biomethane installations** (+ 2 under construction)	**360k** **m³/d of capacity** (+ 8% under construction)	**36M** **m³ of biomethane production** (2020)

The biofuels market is a result of longstanding public policies

Share of ethanol in the gasoline

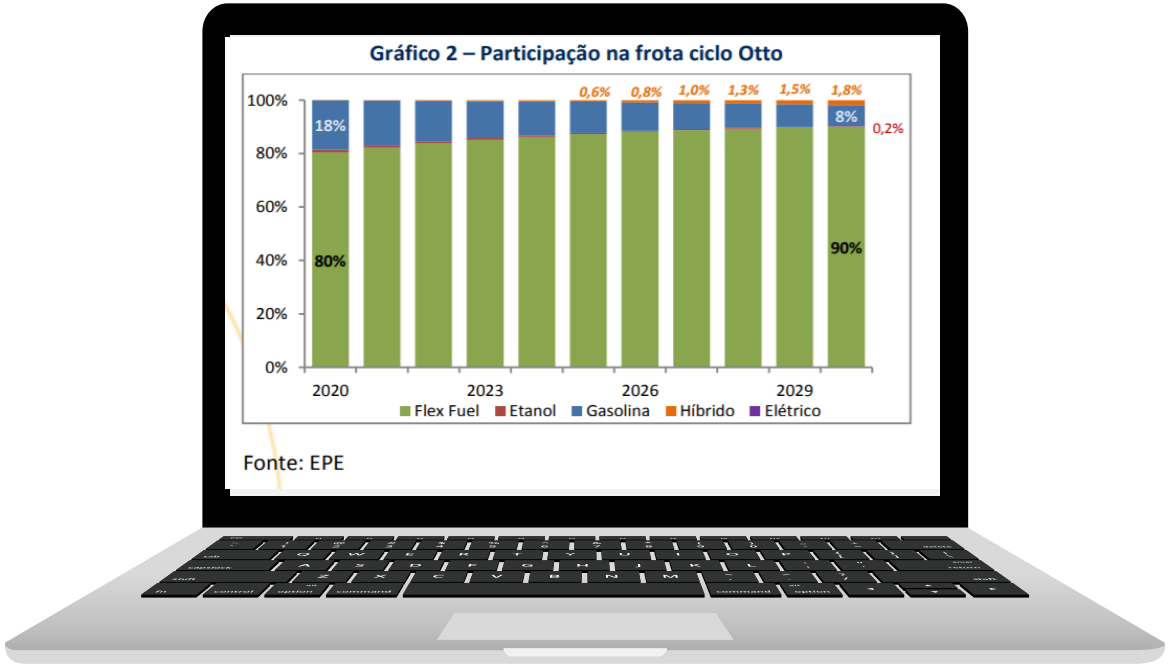


Source: ANFAVEA; MME

Share of biodiesel in the diesel

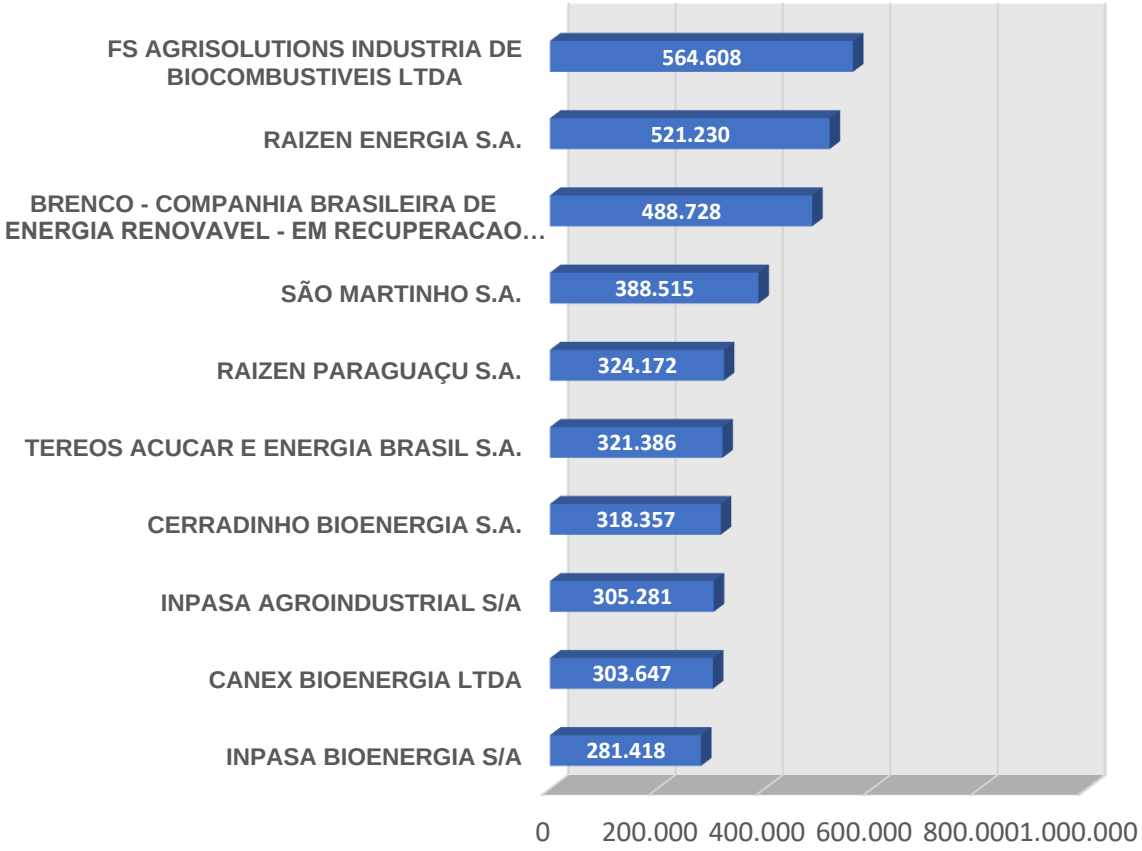
Jan/2008	2%
Jul/2008	3%
Jul/2009	4%
Jan/2010	5%
Aug/2014	6%
Nov/2014	7%
Mar/2017	8%
Mar/2018	10%
Set/2019	11%
Mar/2020	12%
Mar/2021	13%
Mar/2022	14%
Mar/2023	15%

A great portion of vehicles is already flex fuel

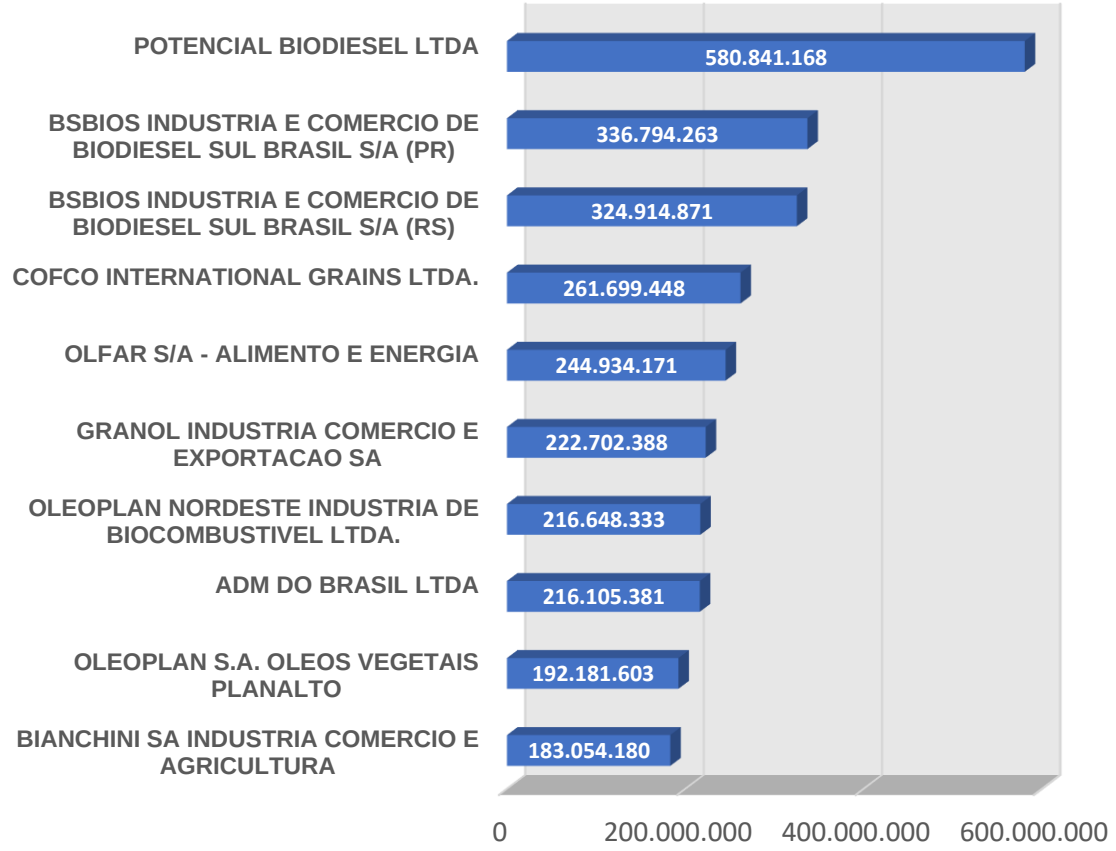


The main players

Ranking of Main Ethanol Producers
(Sales until Sep/2021, m³)



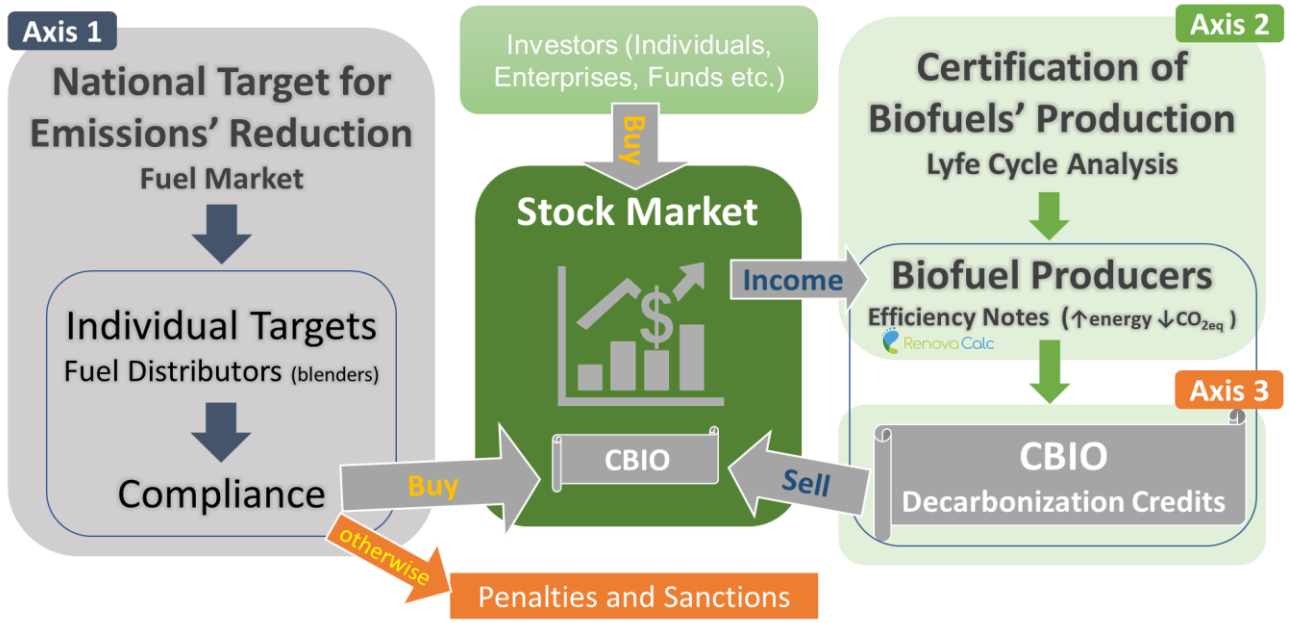
Ranking of Main Biodiesel Producers
(Sales until Sep/2021, m³)



RENOVABIO: the first carbon market in the energy sector

RenovaBio is the National Biofuels Policy to promote the expansion of the production and use of biofuels in Brazil's transportation matrix

- One **CBIO is equivalent to one ton of CO2eq** avoided into the atmosphere
- It is traded by the biofuel producers in the Brazilian stock exchange market (B3)
- Fuel distributors must buy CBio in order to comply their individual targets; otherwise they are liable to penalties and sanctions
- CBIO implies an additional income to producers/importers, what should promote the expansion of biofuels in Brazil in the next years
- Decarbonization goals are reviewed annually by the National Energy Policy Council



RENOVABIO results

2020

CBIOs issued: 18.5 million

CBIOs traded: **14.9 million**

Financial Volume: R$ 650 million

Average Price of CBIO: R$ 43.66

2021
(until Oct/21)

Initial goal: 24.9 million of CBIOs

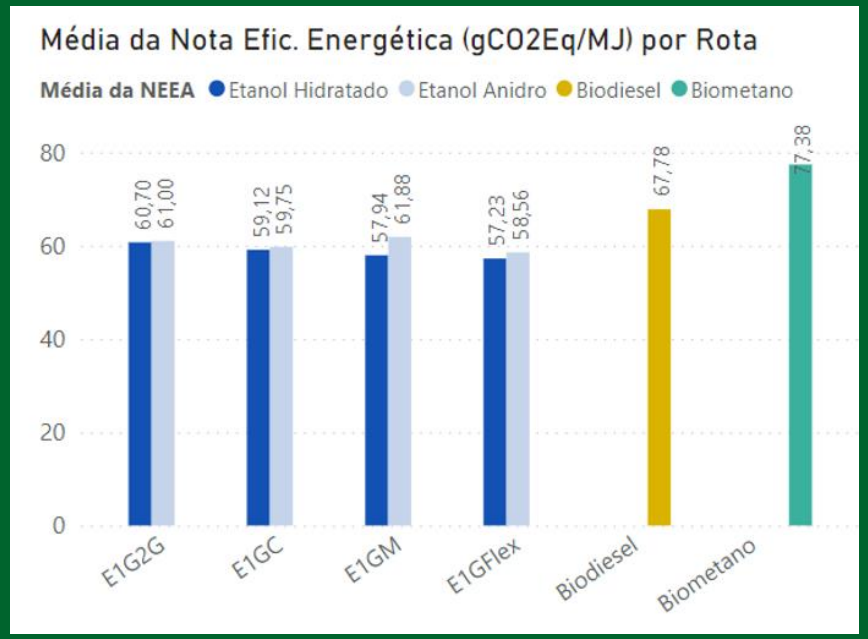
CBIOs issued: **26.2 million**

CBIOS stock: 3.6 million (2020)

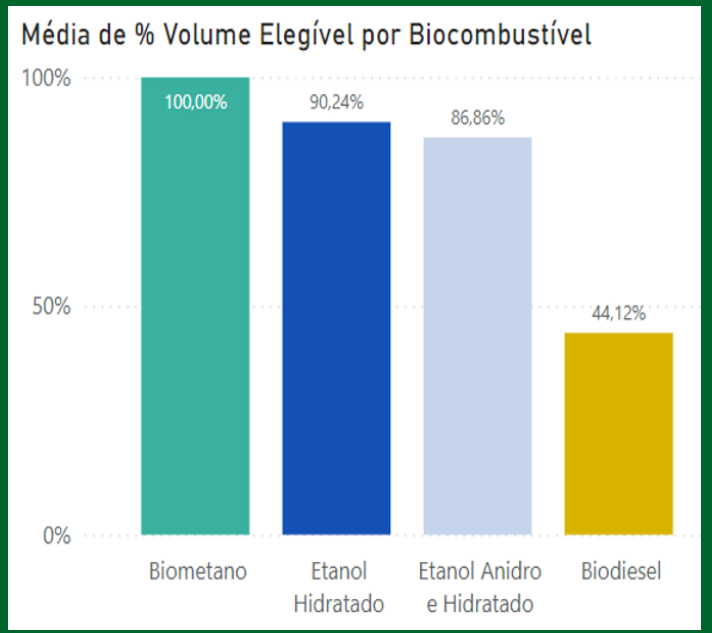
CBIOs traded: **23.4 million**

Average value: R$ 35.14 (US$ 6.25/ton)

Energy Efficiency Grade by biofuel



Volume elected by biofuel



72% **of the biofuel's installations are certified to RENOVABIO Program**

38 million ton **of CO2eq avoided until Oct/21**

Opportunities in the biofuels market

01 Biofuels will remain a **key part for decarbonization** in Latin America

02 Latin America should represent more than 30% of demand world for biofuels by 2040 (S&P Platts)

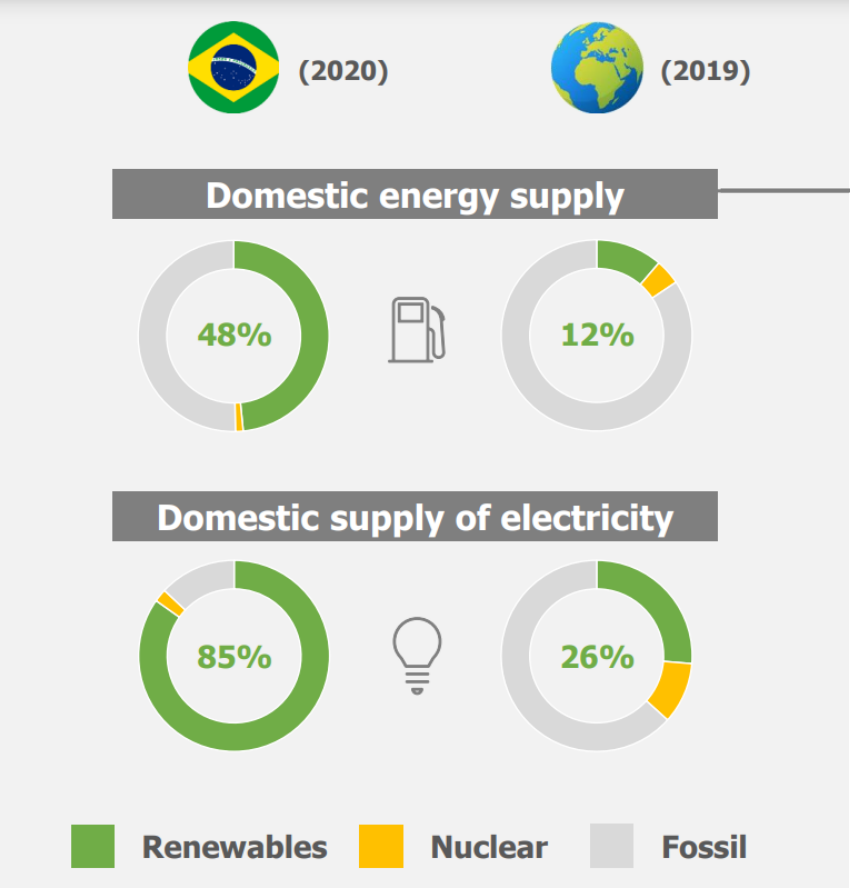
03 Fuel of the Future Government Program: incentives to the large-scale use of 2nd generation ethanol; R&D to encourage fuel-cell technology; creation of green corridors to supply heavy vehicles powered by biomethane; introduction of BioJetFuel; BioCCS etc

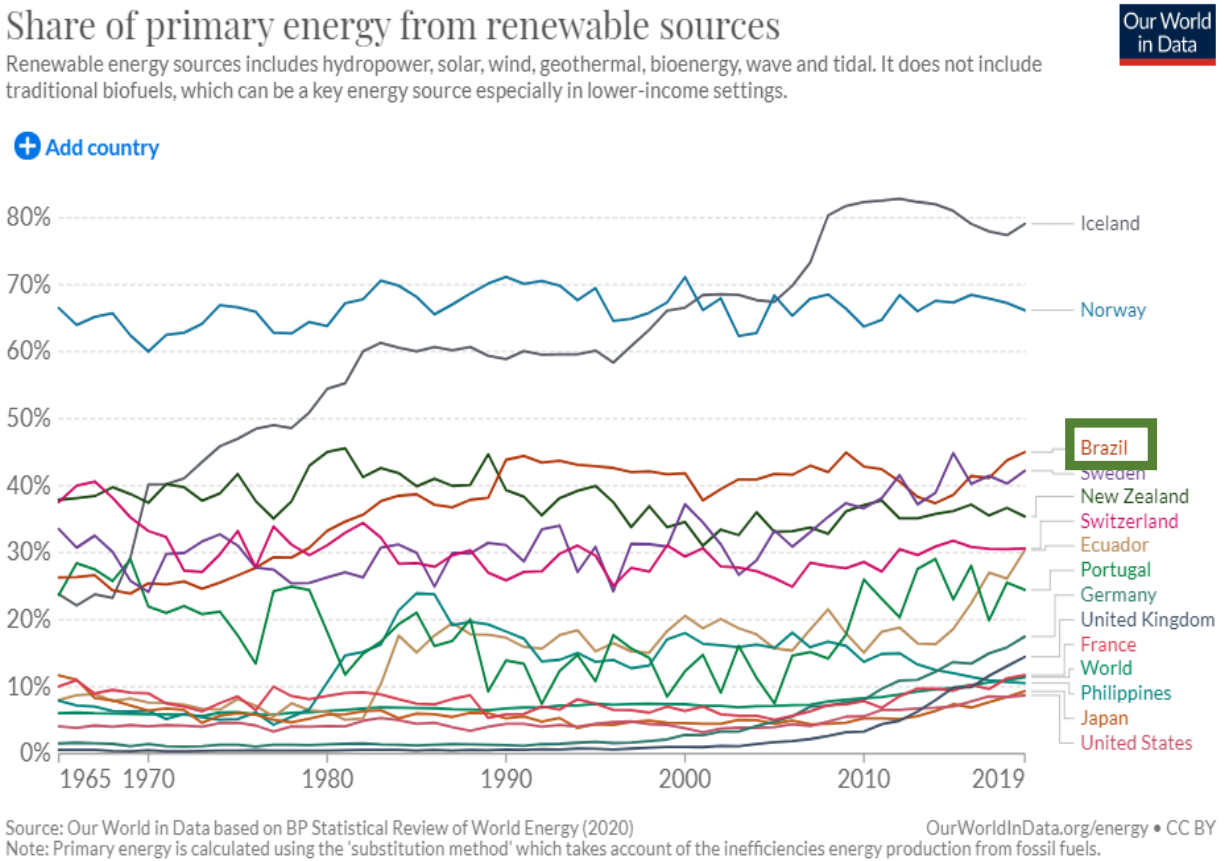
#6

Brazil in the energy transition

Brazil in the energy transition context: a leader

Iceland, Norway and Brazil have the largest share of primary energy from renewables sources in the word

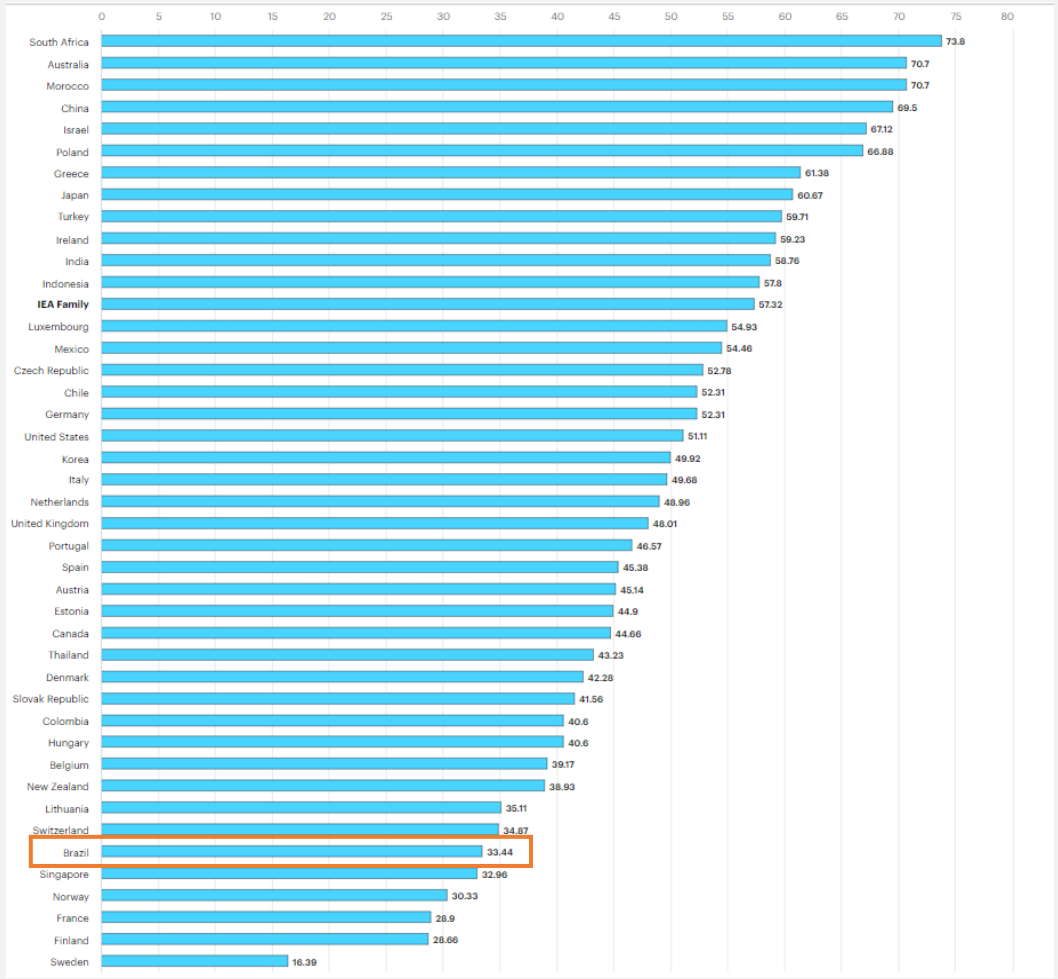




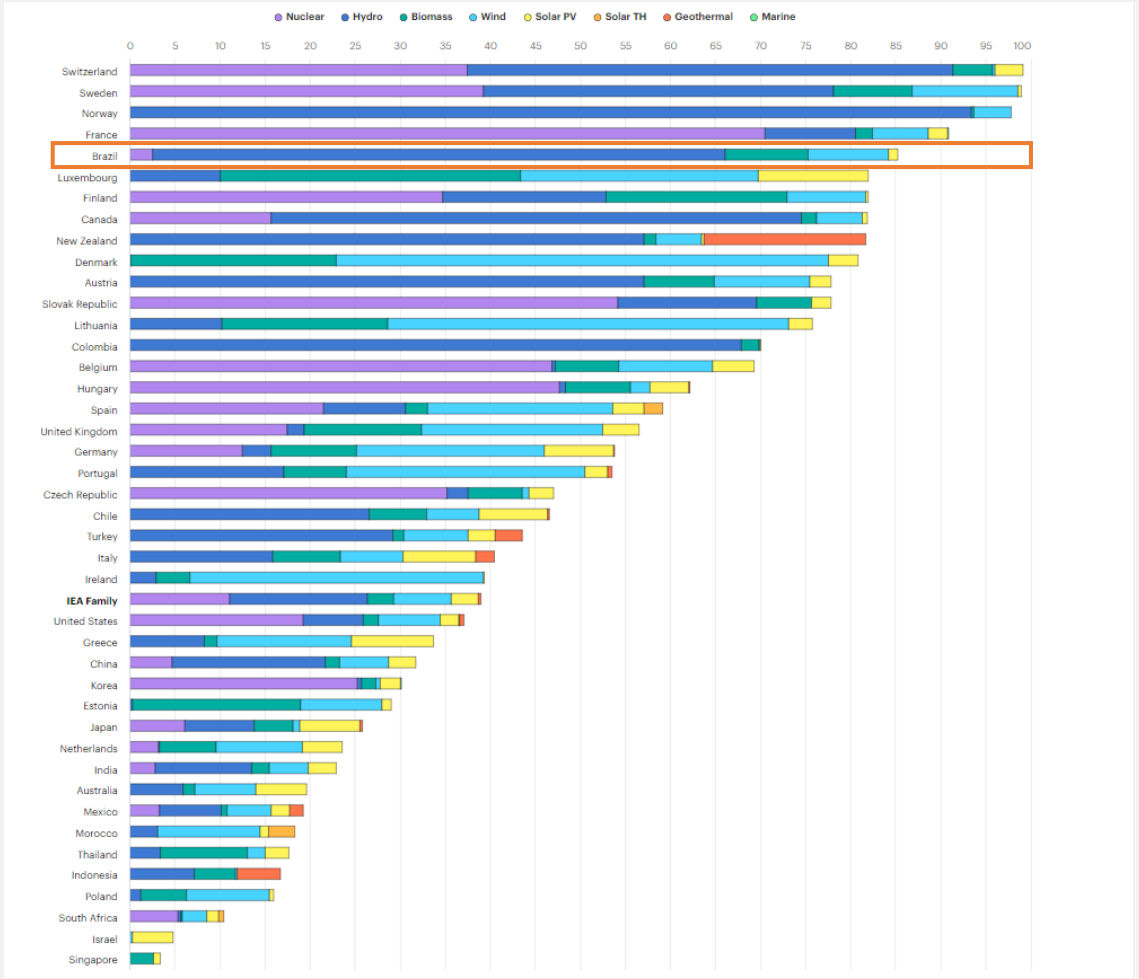
Source: EPE; Our World In Data

Brazil has one of the cleanest energy mix in the world

CO2 intensity of energy mix, 2019 – TCO2/TJ



Low-carbon electricity generation share by source, 2019



Source: IEA

Emissions in the energy sector represent less than half of world average

01 Brazil is not ranked in the top emitters in the energy sector

Top Emitters in Energy Sector (All GHG)

2018	CO_2e
Others	12.57Gt
China	10.32Gt
United States	5.27Gt
India	2.42Gt
Russia	2.28Gt
Japan	1.09Gt
Iran	716.76Mt
Germany	713.82Mt
Canada	626.07Mt
South Korea	617.23Mt
Indonesia	598.17Mt

...

Brazil (437,33 Mt)

Source: Climate Watch (CAIT)

02 Energy makes up nearly three-quarters of global emissions, but in Brazil it represents around 30% of the total emissions

Emissions by Sector – Word (All GHG)

2018	
Energy	76%
Agriculture	12%
Industrial Processes	5.9%
Waste	3.3%
Land-Use Change and Forestry	2.8%

Emissions by Sector – Brazil (All GHG)

2018	
Agriculture	35%
Energy	31%
Land-Use Change and Forestry	27%
Waste	4.9%
Industrial Processes	2.0%

03 Brazil accounts for 1.3% of global fossil fuel and cement emissions

Top Fossil Fuel and Cement Emitters (CO2)

2019	
Others	34%
China	28%
United States	15%
India	7.2%
Russia	4.6%
Japan	3.0%
Iran	2.1%
Germany	1.9%
Indonesia	1.7%
South Korea	1.7%
Saudi Arabia	1.6%

...

Brazil (1,3%)

Source: Climate Watch (GCP)

CO2 emissions per capita: on average, each Brazilian emits 1/7 of what an American emits and 1/3 of what a citizen of the European Union or a Chinese emits in the production and consumption of energy

Brazil has huge and diverse potential for renewables

Brazil is currently among the five most attractive emerging markets for investments in renewable energy. (https://global-climatescope.org/)
Oil majors are also betting on the Brazilian renewables market. We believe they will integrate their portfolio with cleaner energy projects, while capitalizing on synergies and tapping the huge potential in Brazil for renewable energy projects.

Biofuels

Brazil has large experience in producing biofuels and benefits from a longstanding well-established industry. Shell (Raízen) and BP (BP Bunge Bioenergia) are betting high in this market.

Biogas/ Biomethane

Biogas has every condition to achieve greater participation in the Brazilian energy matrix. The sugarcane industry represents a large opportunity for biogas generation. One example is the Raízen Geo Biogas plant.

Hydrogen

National Hydrogen Program has been established recently. Possible investments in green hydrogen announced so far in Ceará, Pernambuco and RJ States are only from companies in the renewable energy sectors.

Solar

Wind

Solar and Wind energies represent a good proportion of our energy matrix. Total operates three solar plants and is developing new wind projects through its affiliate Total Eren. Also, the first solar plant in Equinor's global portfolio is located at Ceará State (Apodi solar power plant).

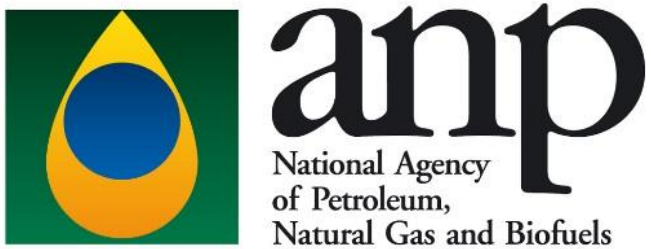
Brazil enjoys great potential for offshore wind plants. Brazil's shallow waters alone hold potential for 700GW of offshore wind generation. Equinor plans to install 4GW of offshore wind energy in Rio and Espírito Santo States.

#6

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
Huge opportunities in Petrobras divestment plan (brownfields opportunities with cash flow)
Market Opening in the midstream (New Gas Law) and downstream
One of the largest fuel market
Great Potential for renewables



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