Energy Policy in Brazil: What's next for upstream, refining and LNG?

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THEDIALOGUE
Leadership for the Americas

anp
National Agency of Petroleum, Natural Gas and Biofuels

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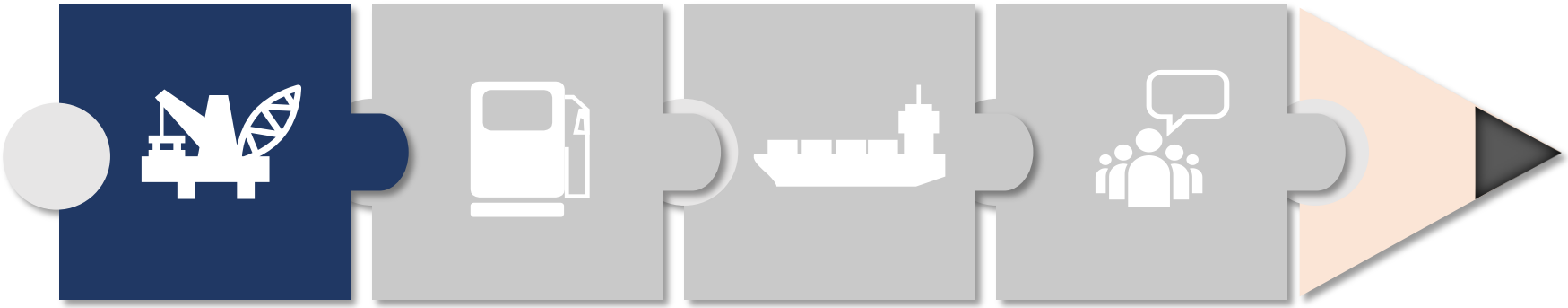
Outline

01 UPSTREAM

What we did, the results and what´s next

03 LNG MARKET

Opportunities



02 REFINING

What is ongoing in Brazil and the need for competition

04 FINAL REMARKS

A lot has been achieved…

Main Adopted Measures

Late 2016

Petrobras: no longer sole operator for the pre-salt play
(Law 13,365/2016)

2017

Bidding Rounds Schedule until 2019
(CNPE Resolution 10/2017)

New Local Content Policy – future rounds
(CNPE Resolution 07/2017)

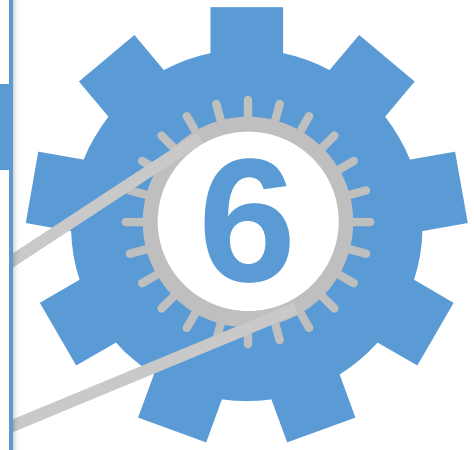
New E&P Policies
(CNPE Resolution 17/2017)

Exploratory Phase Extension (BID 11 and BID 12)
(CNPE Resolution 708/2017)

REPETRO Extension – fiscal regime
(Law 13,586/2017)

2018

LC waiver for contracts up to the 13th bidding round
(ANP Ordinance 726/2018)



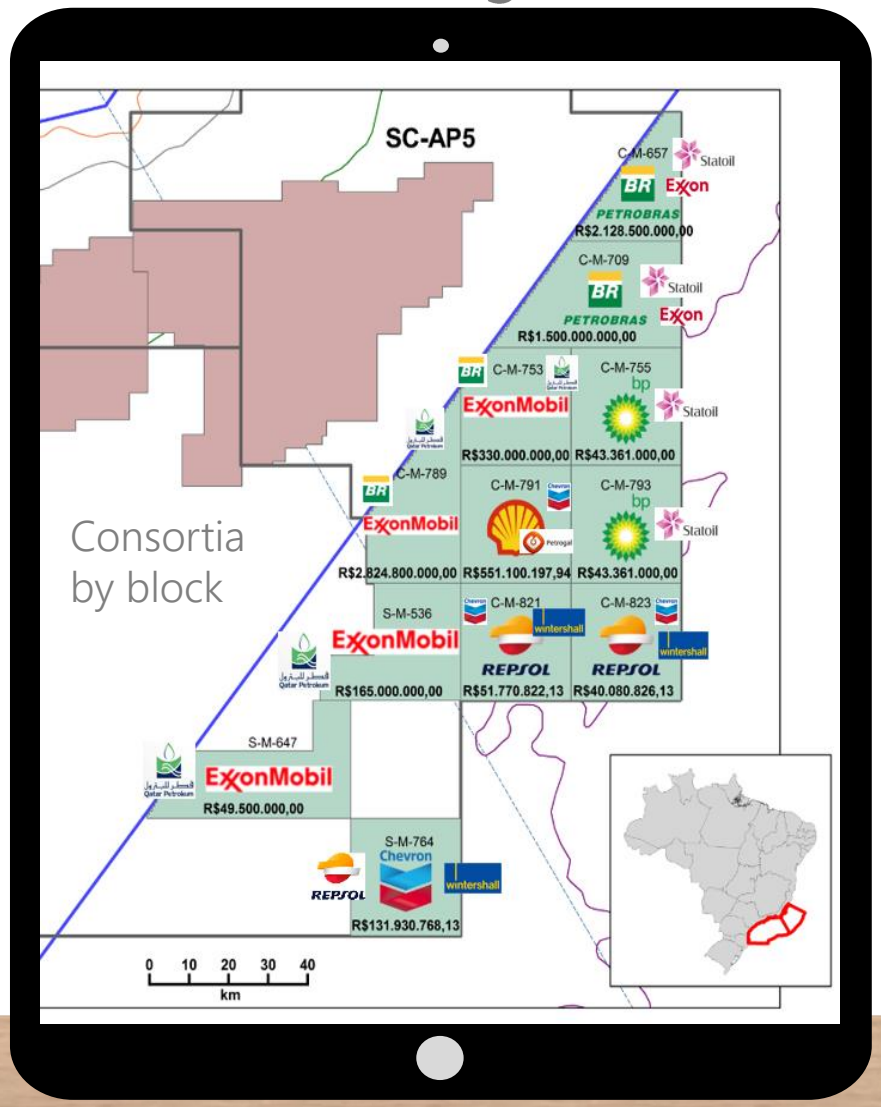
Bidding Rounds
(in 2017/2018)

Bidding rounds results

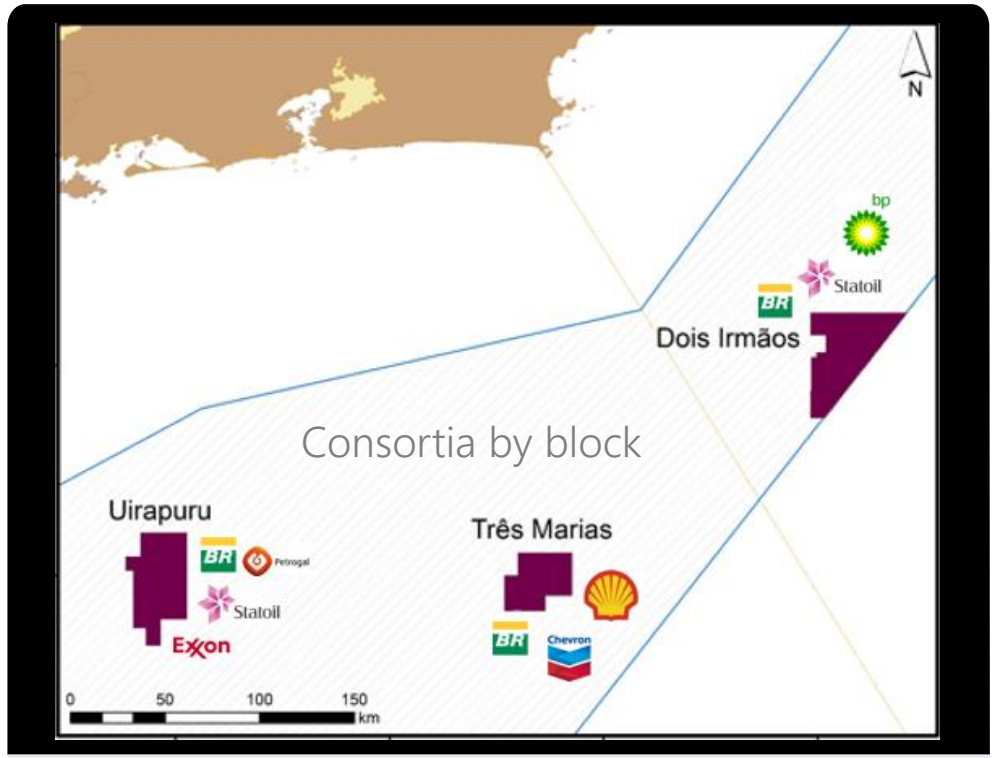
Bidding Round	Acquired Blocks	Signature Bonuses (R$ billion)	Registered Companies	Winners Companies	Premium
Brasil 14th Round Oil & Gas Bidding Rounds	37 (24 onshore and 13 offshore)	3.84	32	17	1,556%
ROUND Brazil 15 OIL AND GAS CONCESSIONS	22	8.01	17	12	622%
PRE-SALT Brazil 2 PRODUCTION SHARE	3	3.3	10	7	261%
PRE-SALT Brazil 3 PRODUCTION SHARE	3	2.85	14	6	202%
PRE-SALT Brazil 4 PRODUCTION SHARE	3	3.15	16	7	202%
Total	**68**	**R$ 21.15**	**High competition and record results!**		

A great diversity winners in the last auctions

15th Bidding Round

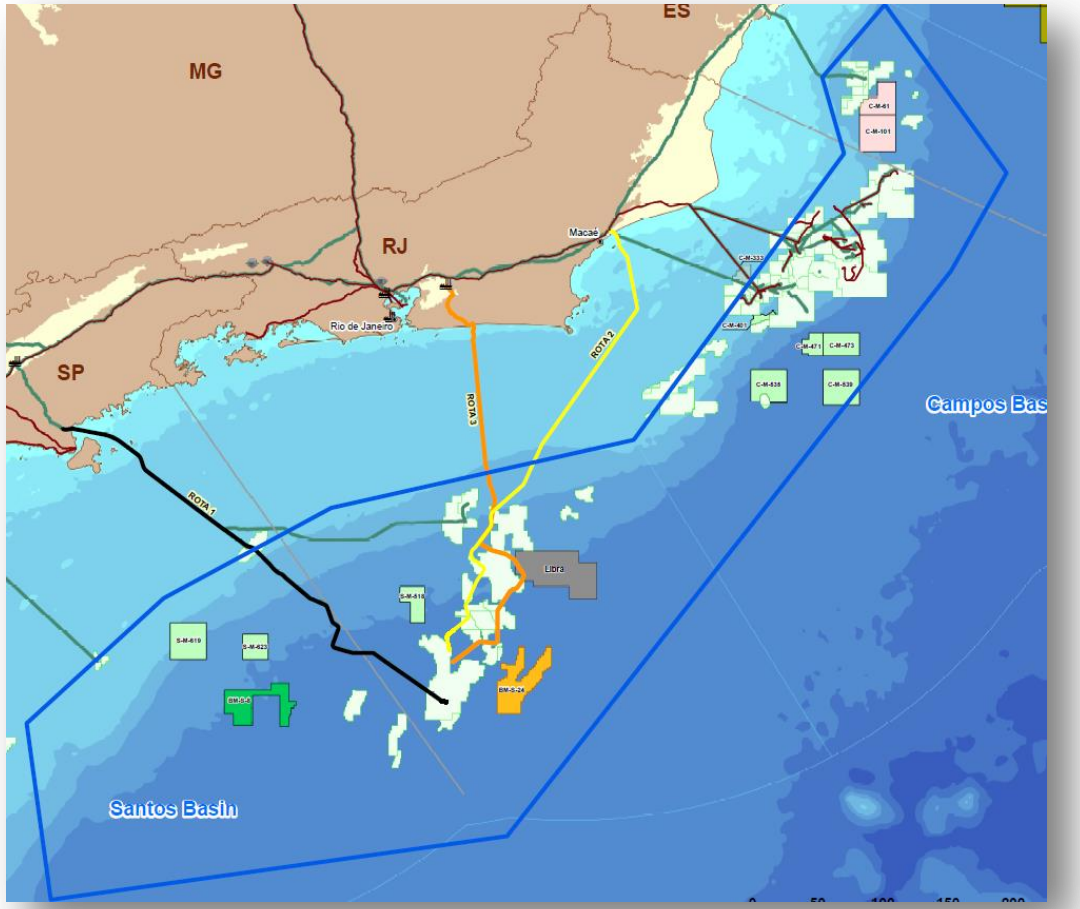


4th Pre-Salt Bidding Round

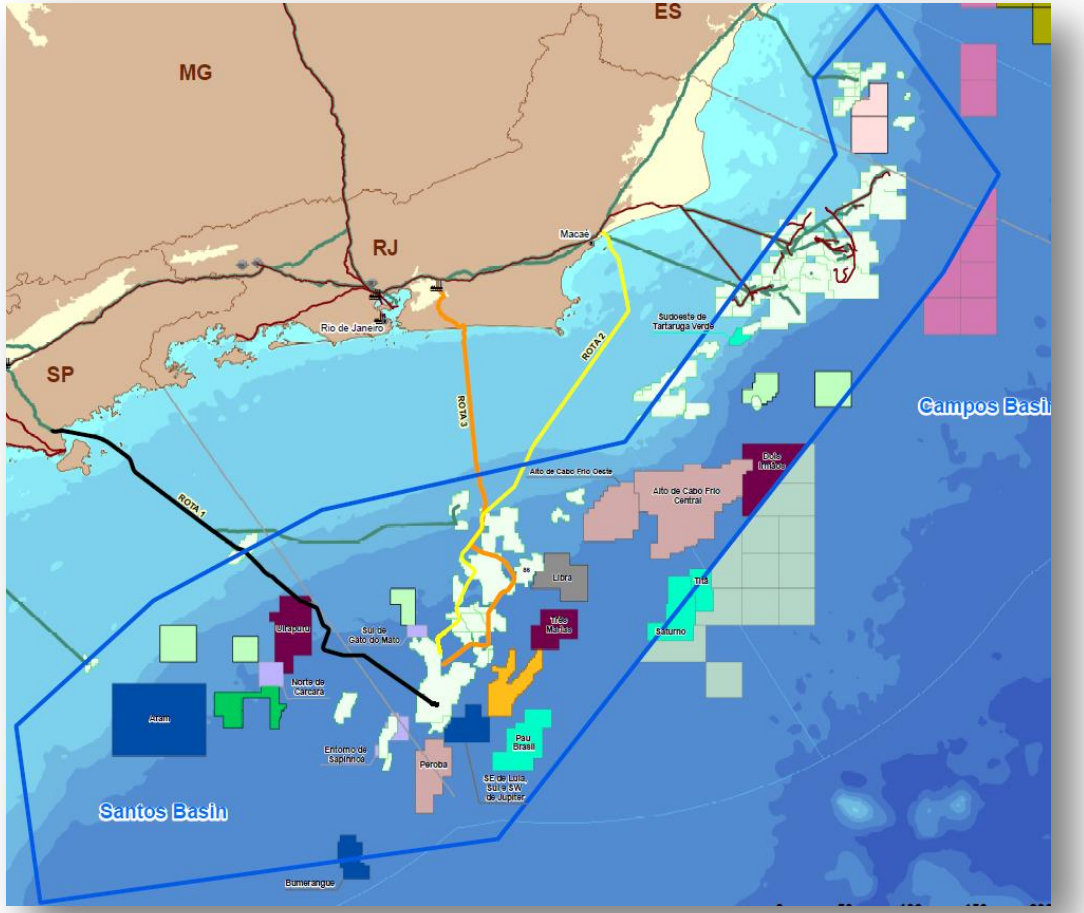


The new pre-salt exploratory scenario

Before



After (up to 2019)



And the potential results are…

US$ 80B

R$ 300B

New Investments

US$ 334B

R$ 1,240B

Tax Revenues

2

Million bpd

(peak production)

17

New Platforms

Hundreds of Wells

*Brent = US$ 70/bbl
Exchange Rate = R$ 3,70/US$

Potential results for the following bidding rounds:

Brasil 14th Round – Oil & Gas Bidding Rounds

Round Brazil 15 – Oil and Gas Concessions

Pre-Salt Brazil 2 – Production Share

Pre-Salt Brazil 3 – Production Share

Pre-Salt Brazil 4 – Production Share

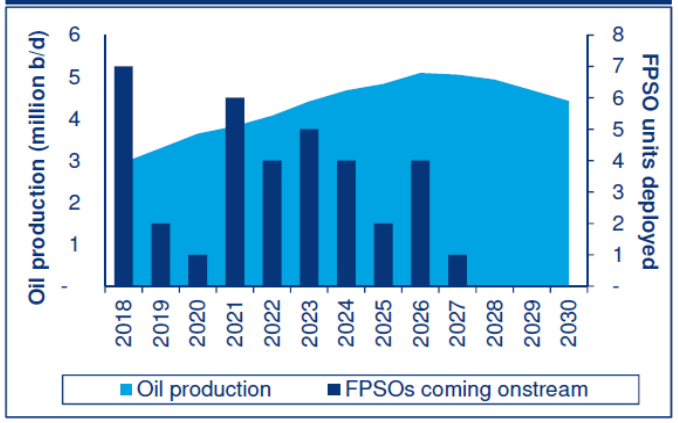
The potential results for new LC Policy

Improvements to Brazil's local content (LC) rules in 2018 will unlock investment in 36 FPSOs to develop 21 billion barrels until 2027

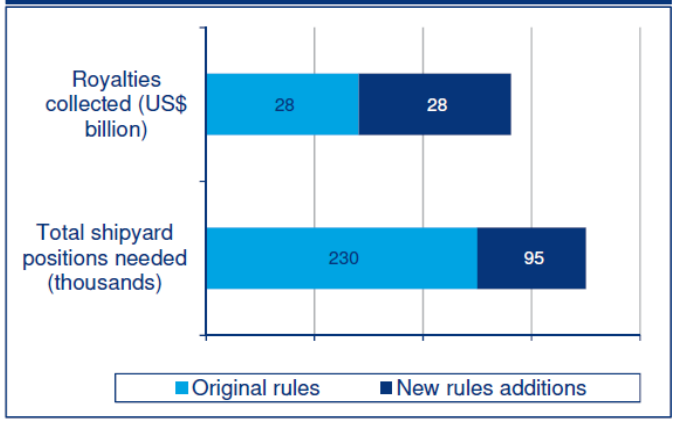
A significant reduction in LC fines will debottleneck the domestic supply chain. FPSO hulls can be built internationally while selected modules are built and integrated locally.

Better utilization of the supply chain allows a faster development of the 21 billion boe of discovered resources, boosting royalty collection and job creation.

Brazil's oil production potential from discovered resources



Associated job creation and royalties through 2027



Production is based on visible development projects. No adjustment has been made for unforeseen project delays and shutdowns. It also excludes additional production from reserves growth and yet-to-find reserves. Please refer to our Macro Oils and Oil Supply Tool for a fully risked view of oil supply.

Source: Wood Mackenzie

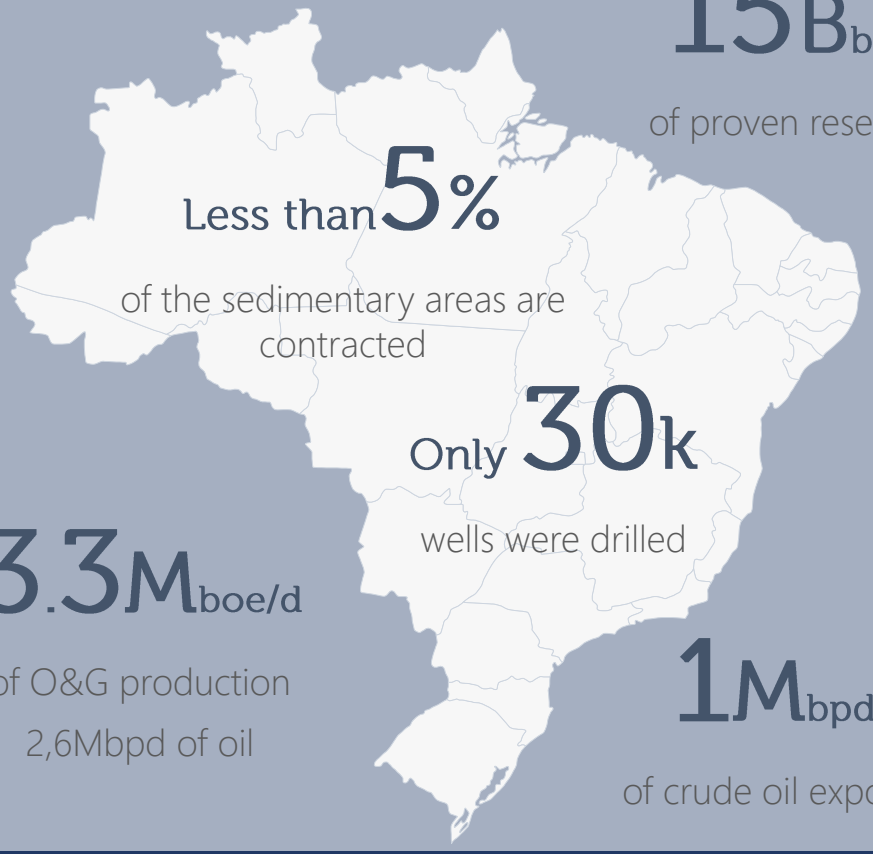
Much more must be addressed…

Future: a high speed of transition and an increase of competition

- Competitive pressures within global energy markets will intensify
- The global energy mix will the most diverse the world has ever seen by 2040, with oil, gas, coal and non-fossil fuels each contributing around 25%
- Demand for oil grows before plateauing in the late 2030s
- Renewables are by far the fastest-growing fuel source, increasing five-fold and providing around 14% of primary energy

Source: BP Energy Outlook 2018

Brazil: the numbers do not reflect our potential

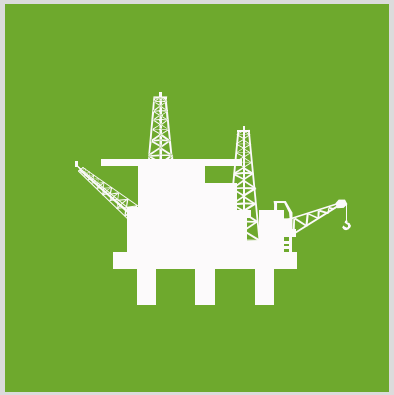


Brazil has to boost O&G activities to generate economic growth while they have value

Three different E&P environments

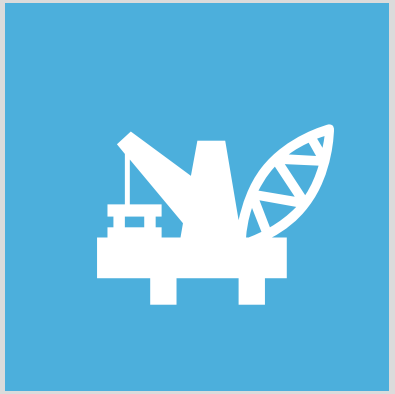
Onshore

Mature Basins and New Frontier Basins (mostly gas prone). Potential for unconventional to be unleashed.



Conventional Offshore

All the East Margin besides the pre-salt region and Equatorial Margin, including new frontier areas and a significant number of large mature fields.



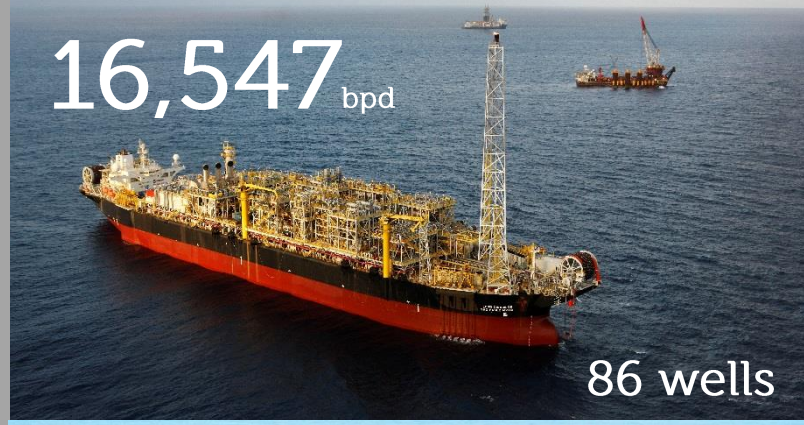
Pre-Salt

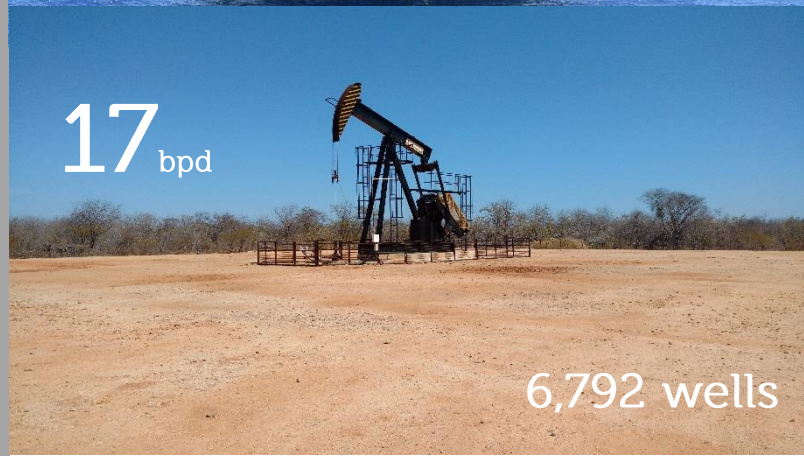
One of the World´s hottest oil play, home to the largest offshore oil discoveries in the last decade.

Production

7% 39% 54%

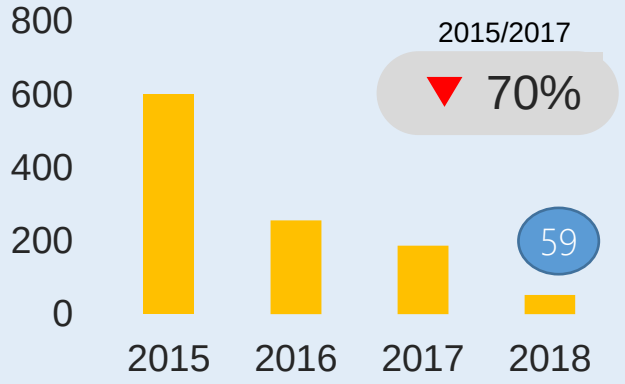
Average oil production per well



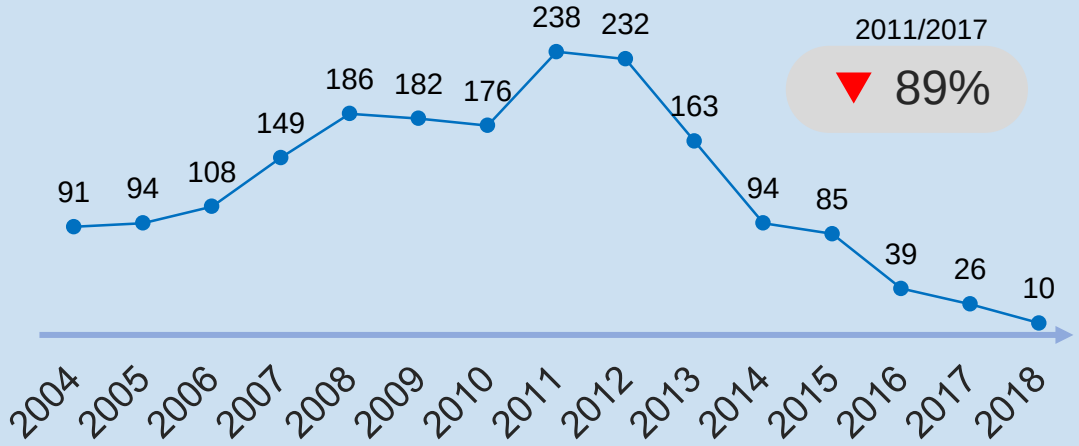


Increasing exploration and revitalizing activities

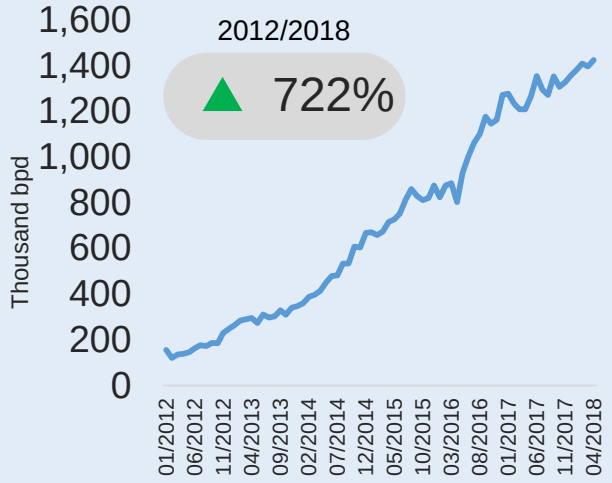
Development Wells Concluded



Exploratory Wells Concluded



Pre-Salt Oil Production



2012/2018

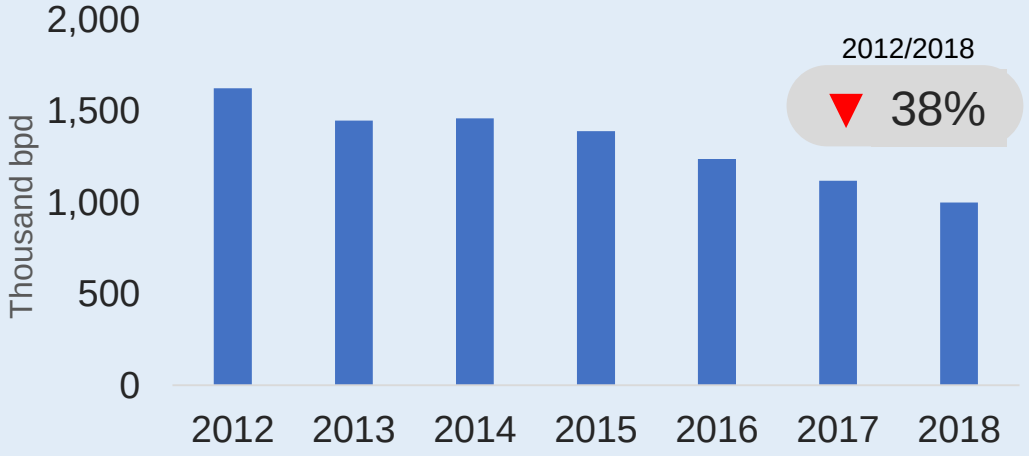
▼ 35%

Onshore oil Production

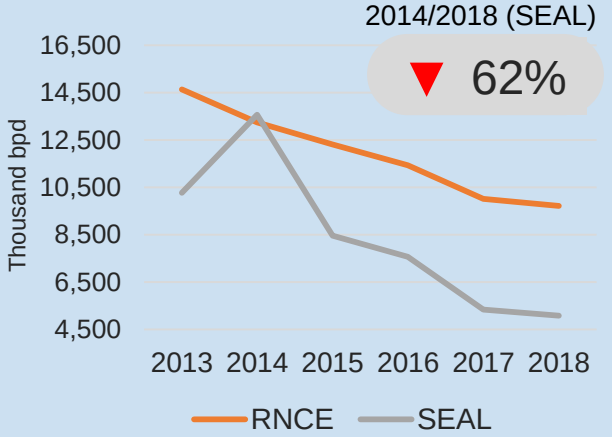
(May, 2018)

111,192

Pos-Salt Campos Basin Oil Production

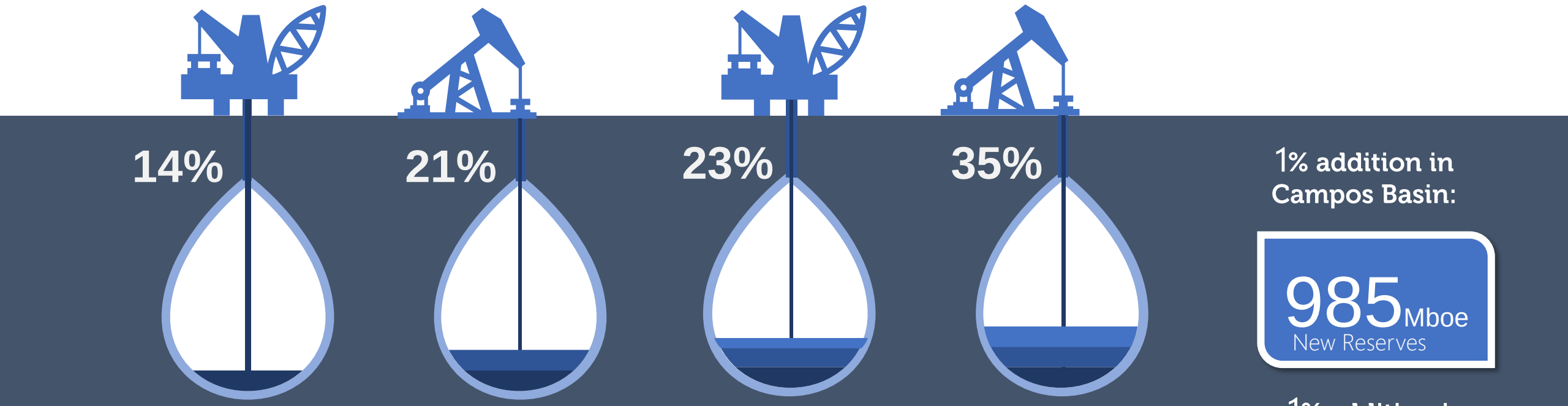


Northeast Basins Offshore Oil Production



*Updated (06/21/18)

Maximizing the recovery factor



Campos Basin
Current O&G Recovery Factor

Brazil
Final O&G Recovery Factor

Campos Basin
Final O&G Recovery Factor

World
Average Final O&G Recovery Factor

1% addition in Campos Basin:

985 Mboe
New Reserves

1% addition in Onshore:

200 Mboe
New Reserves

*Source: Annual Reserves Bulletin (12/31/2017)

Attracting the right players

01 Supermajors
Major Operators

02 Major Operators
Exploration Specialists
Mature Field Players

03 Small and Medium
Companies

Supported by oilfield service companies, suppliers and financial institutions

Our potential

5.5M bpd

Potential forecast production in 10 years

>50 New FPSOs

The most prominent deep water environment

Mature fields/ basins

Low recovery rate in average. 1% addition in the Brazilian recovery factor: 2,2Bboe of new reserves and US$18B in new investments

New Frontier Basins

We barely know our potential. Unconventional resources discussion should progress

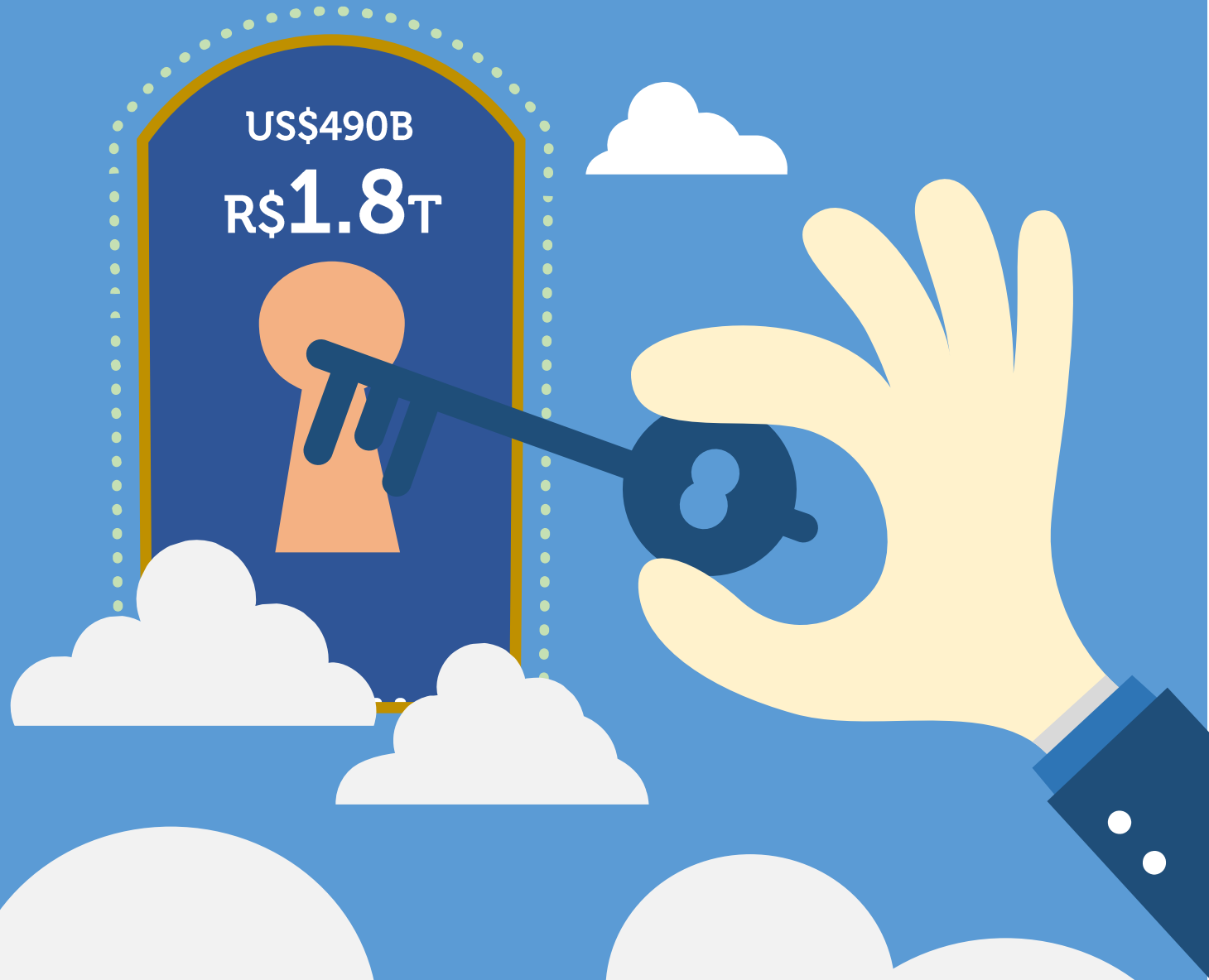
Contracted or in progress

Need to be unlocked

We need a diversified industry to unlock our full potential

According to our analysts, the E&P sector has potential to attract R$ 1.8 trillion of investments in the next 10 years. But we still have half of this value estimated under contracts.

To double it, we need a diversified oil industry with a significant number of players in each environment. Nowadays, we only have around 100 E&P companies and 9 production operators. Petrobras still operates 94% of the production.

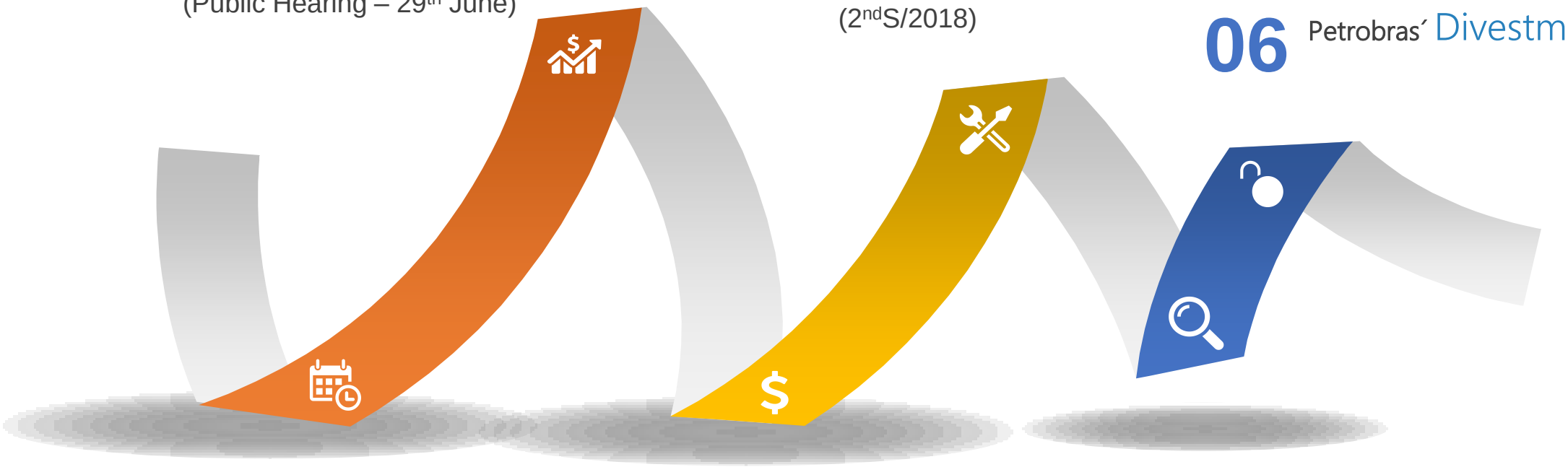


Ongoing measures…

02 New ANP Ordinance: Royalties reduction for the incremental production in mature fields (Public Hearing – 29th June)

04 ANP Ordinance Update: R&D – a new strategy (2ndS/2018)

06 Petrobras´ Divestment Plan



01 Bidding Rounds Open Acreage (more attractive contracts)

03 New ANP Ordinance: Reserve Based Lending (July/2018)

05 ANP Ordinance Update: LC measurement and certification (2ndS/2018)

Bidding rounds schedule

2018

- **September 28th** — PRE-SALT Brazil 5 — PRODUCTION SHARE
- **As from November** — OPEN ACREAGE Brazil — OIL AND GAS CONCESSIONS — 1st Wave
- **November 29th** — TRANSFER OF RIGHTS SURPLUS Brazil — PRODUCTION SHARE

2019

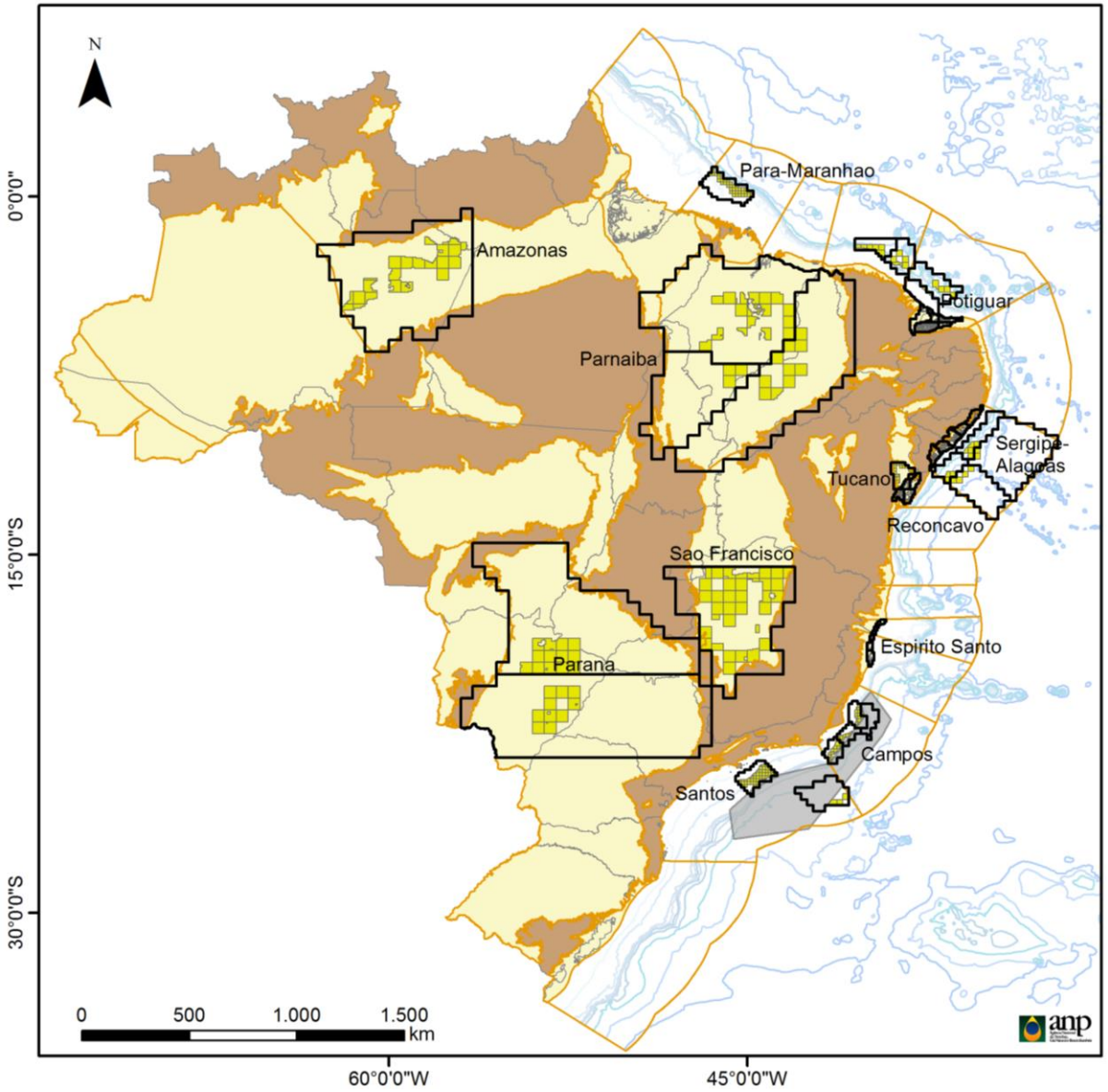
- **1st Semester** — OPEN ACREAGE Brazil — OIL AND GAS CONCESSIONS — 2nd Wave
- **3rd Q** — ROUND Brazil 16 — OIL AND GAS CONCESSIONS; PRE-SALT Brazil 6 — PRODUCTION SHARE

To be confirmed

2020/2021

- ROUND Brazil 17 — OIL AND GAS CONCESSIONS
- ROUND Brazil 18 — OIL AND GAS CONCESSIONS

Open Acreage 1st Wave



346,035
Km² area

14
Mature fields

884
Blocks

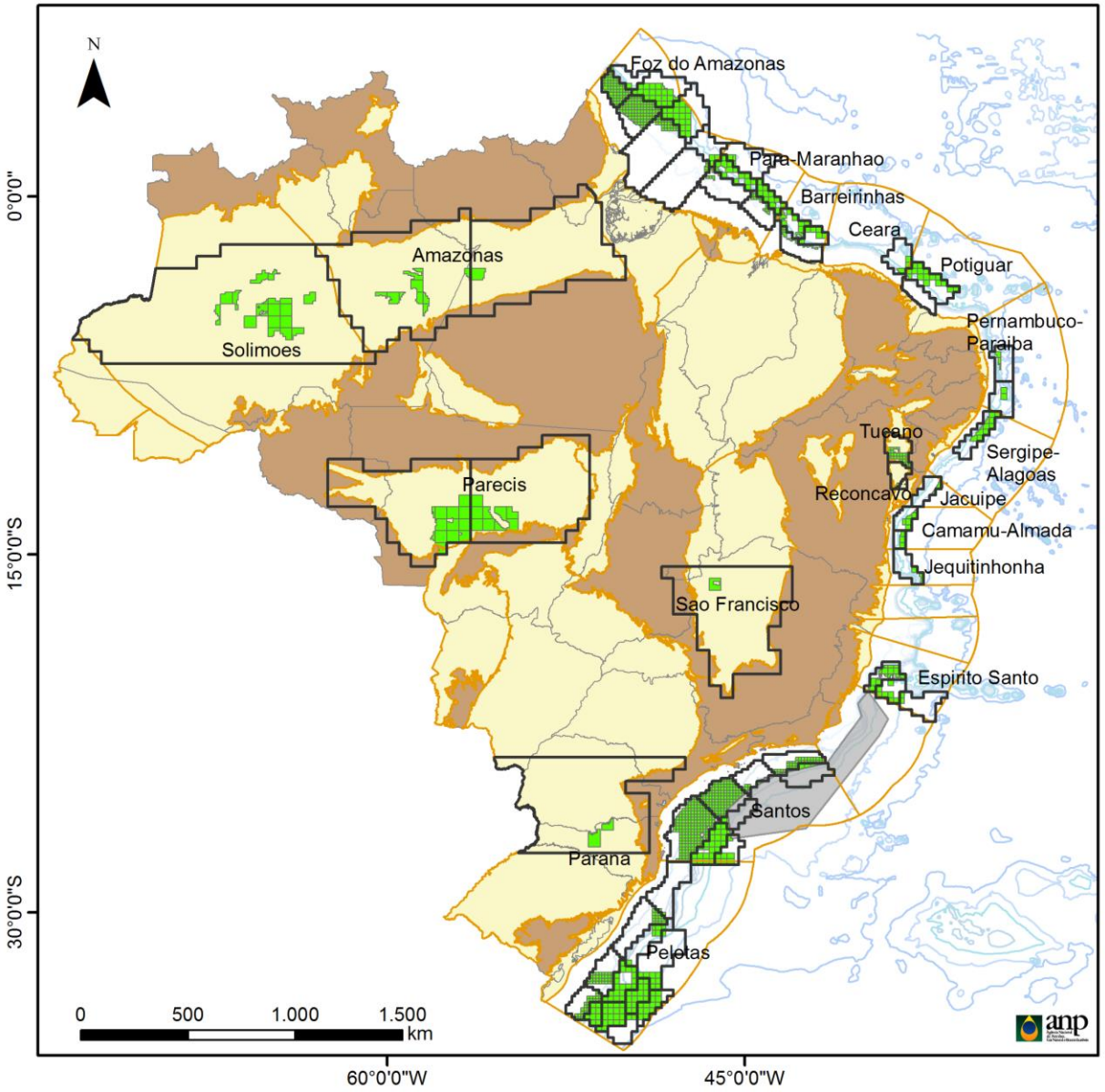
15
Sedimentary basins

Blocks not awarded in the 15th Bidding Round are included

- **722** blocks in **9 onshore** basins
- **162** blocks in **6 offshore** basins

Open Acreage 2nd Wave

OPEN ACREAGE Brazil
OIL AND GAS CONCESSIONS



Deadline for the disclosure of parameters and rules:
December/2018

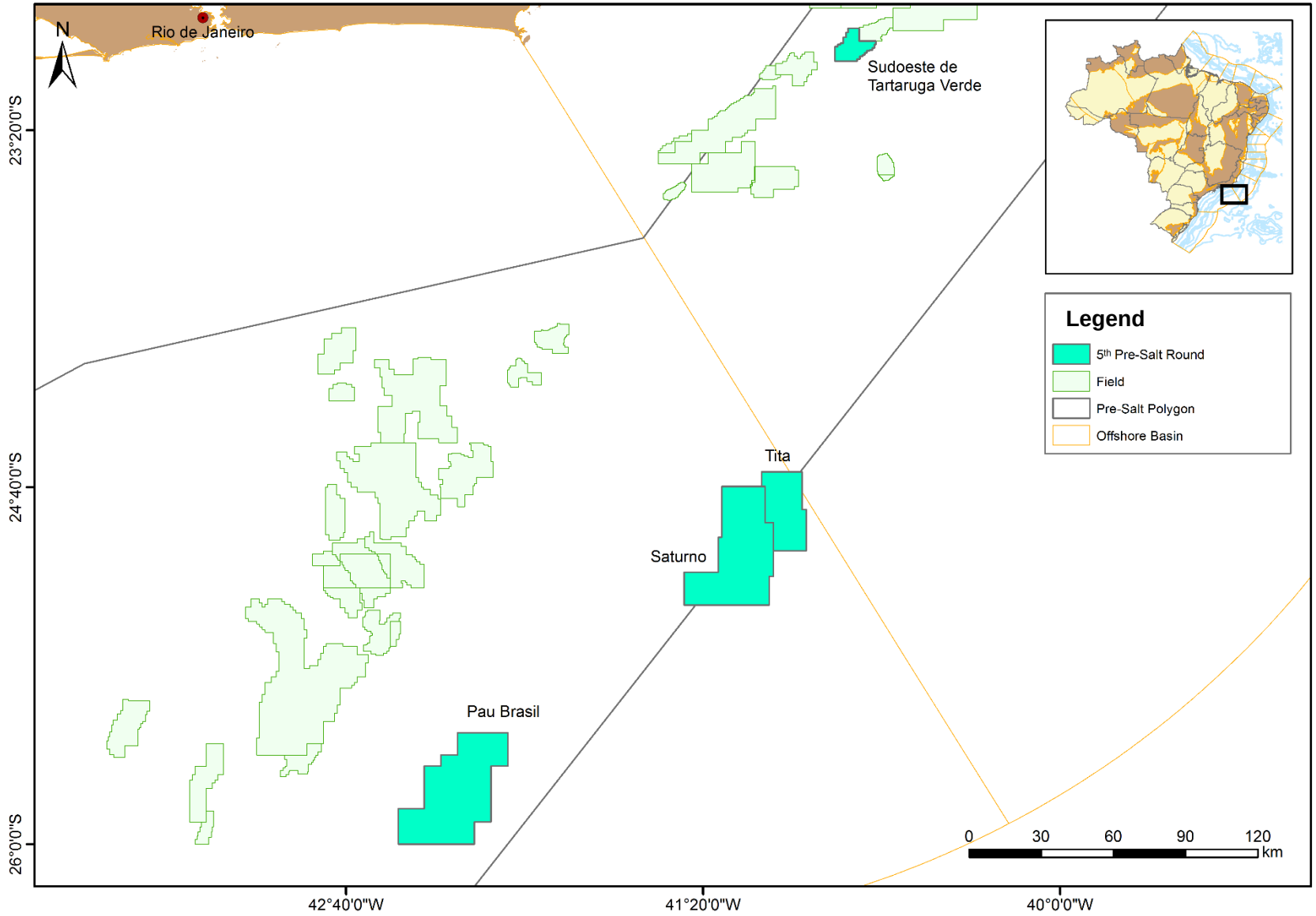
1,054 Blocks

441,400 Km² area

20 Sedimentary basins

- **85** blocks in **7** onshore basins
- **969** blocks in **13** offshore basins

5th Pre-Salt Bidding Round

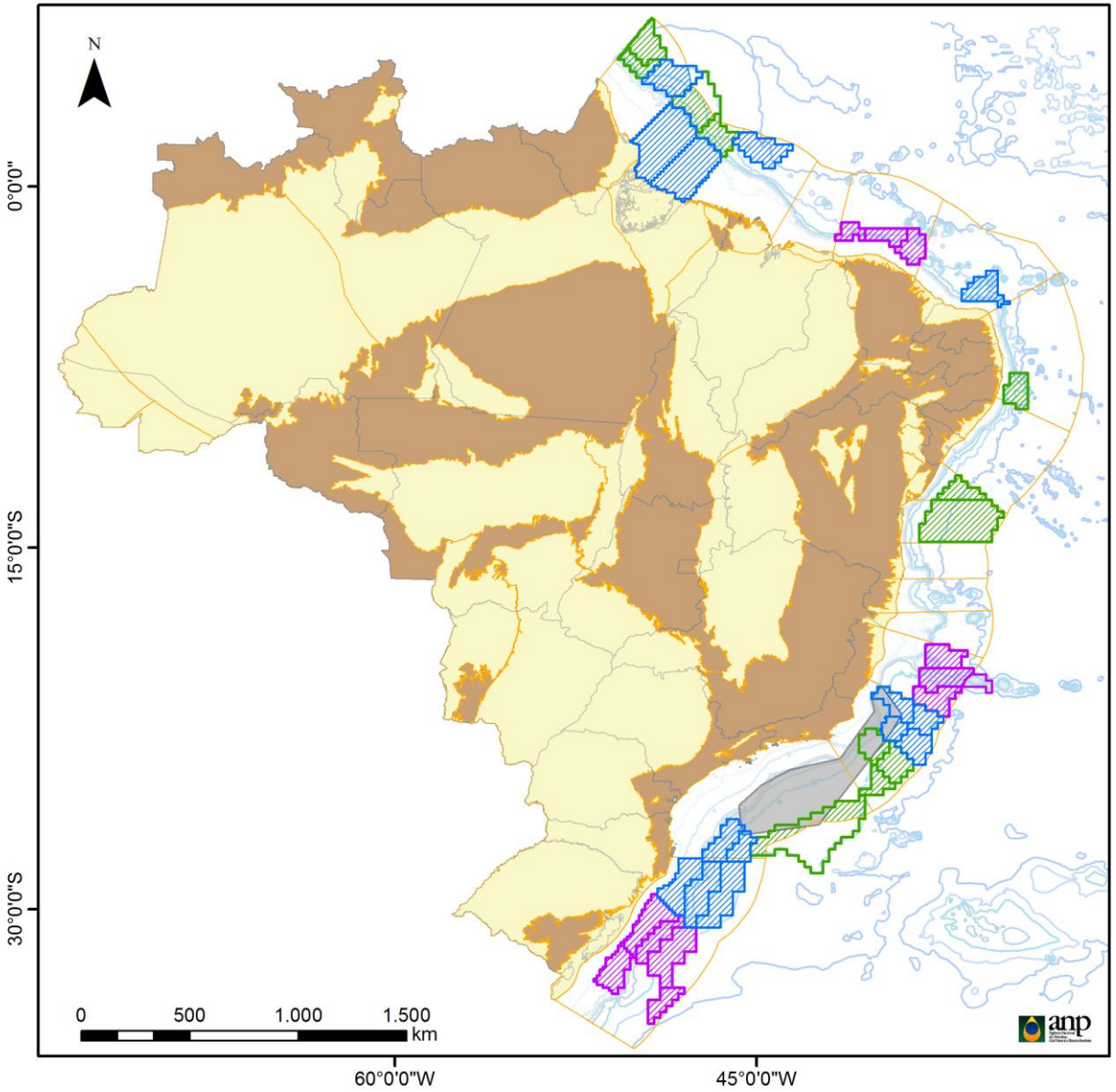


17 Bbbl

Estimated unrisked oil in place volumes (P50)

4 areas

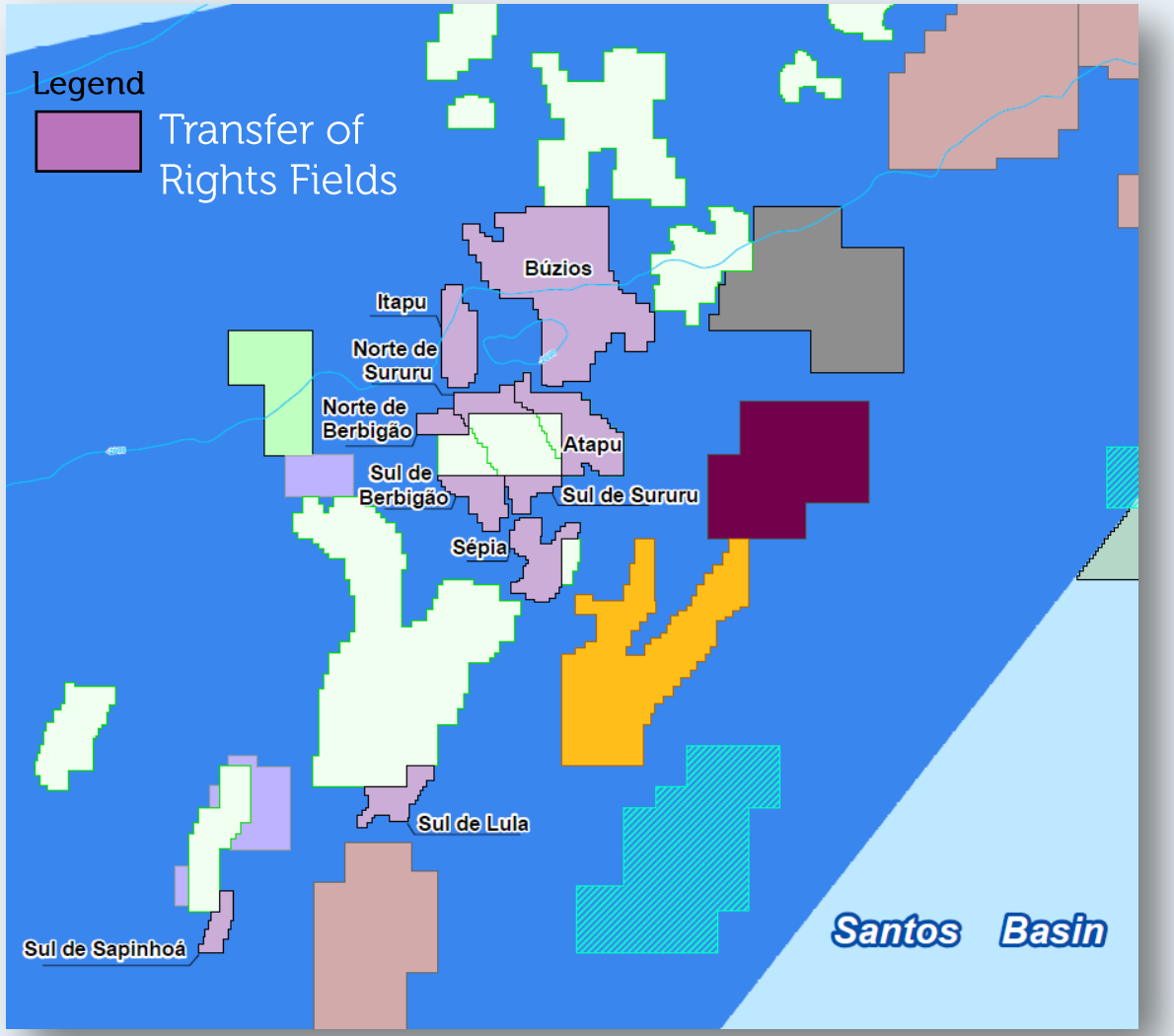
Sectors for the future concession bidding rounds



Legend

- Round 16 – Sector
- Round 16 – Area for Study
- Round 17 - Sector
- Round 17 - Area for Study
- Round 18 - Sector
- Round 18 - Area for Study
- Pre-salt Polygon
- State limit
- Offshore basins
- Onshore basins
- Basement

Transfer of Rights Surplus Opportunities



10
Fields

US$ 489B
R$ 1,809B
Tax Revenues

10.8
Billion boe
(GCA P50 recoverable volumes)

17
New Platforms

*Brent = US$ 70/bbl
Exchange Rate = R$ 3,70/US$

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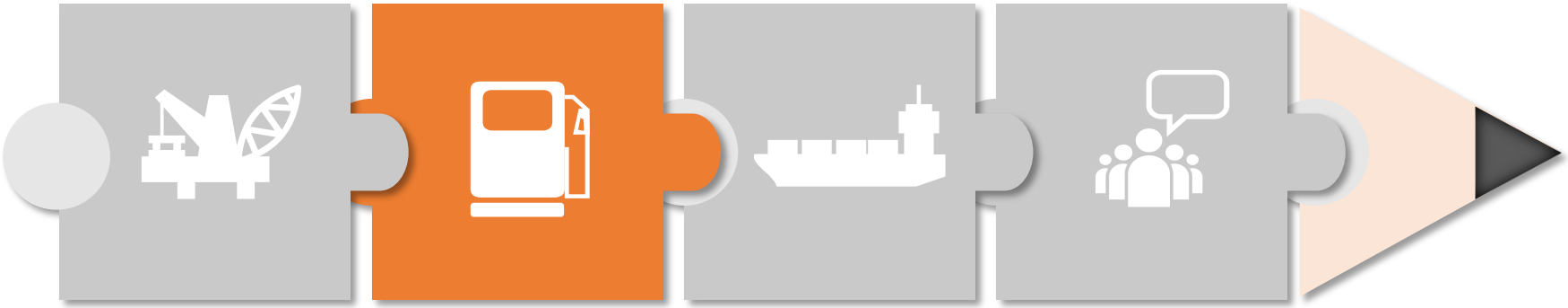
03 LNG MARKET

Opportunities



02 REFINING

What is ongoing in Brazil and opportunities

04 FINAL REMARKS

National Supply

National Sales of Oil Products (2017)

~2,3

Million bpd

National Sales of Biofuels (2017)

515

Thousand bpd

Imports (2017)
(ethanol, naphtha, QAV, LPG, Gasoline e Diesel)

538

Thousand bpd

7th

Largest oil products consumer

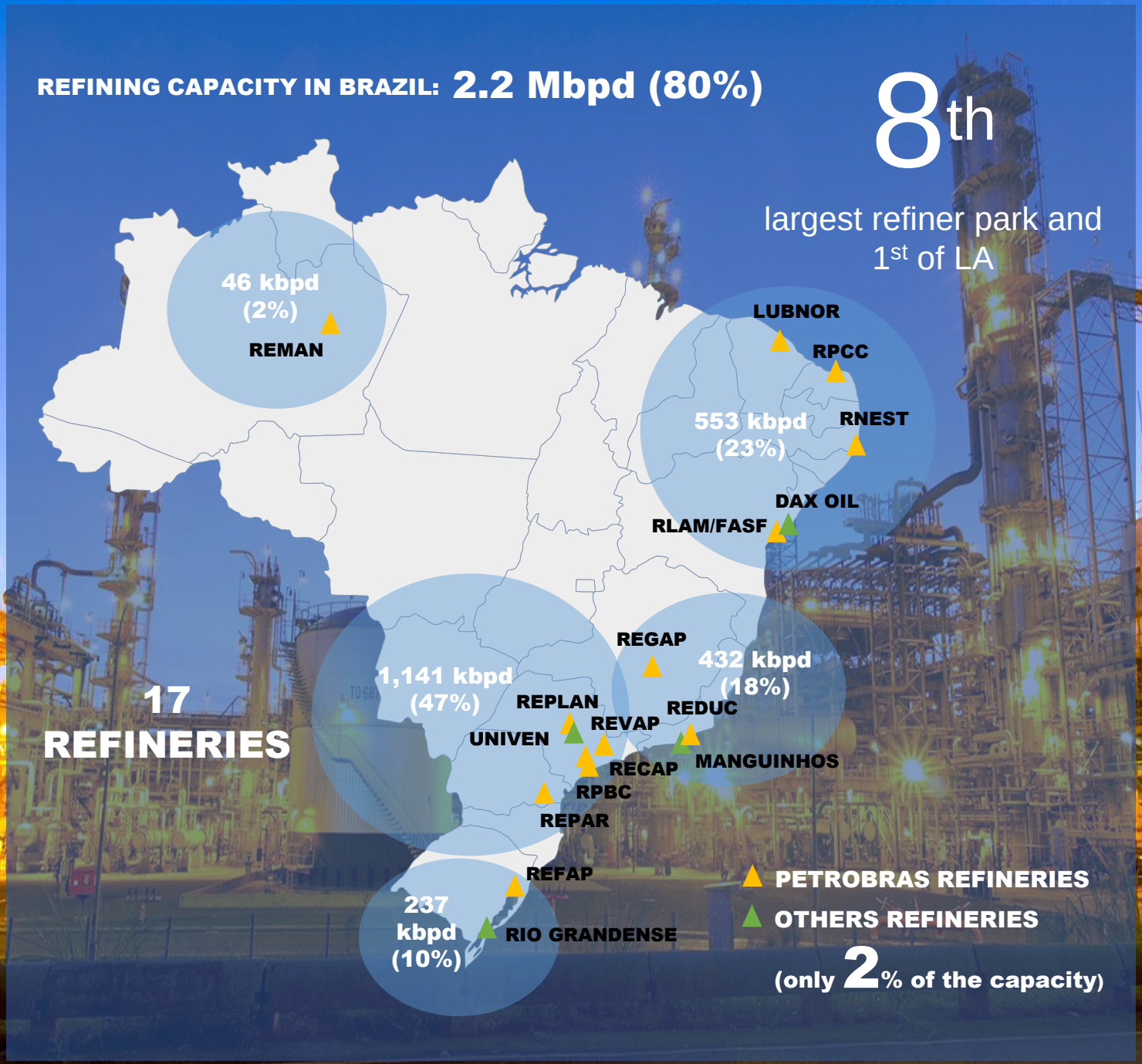
Strong and growing participation of biofuels

51 Biodiesel Plants

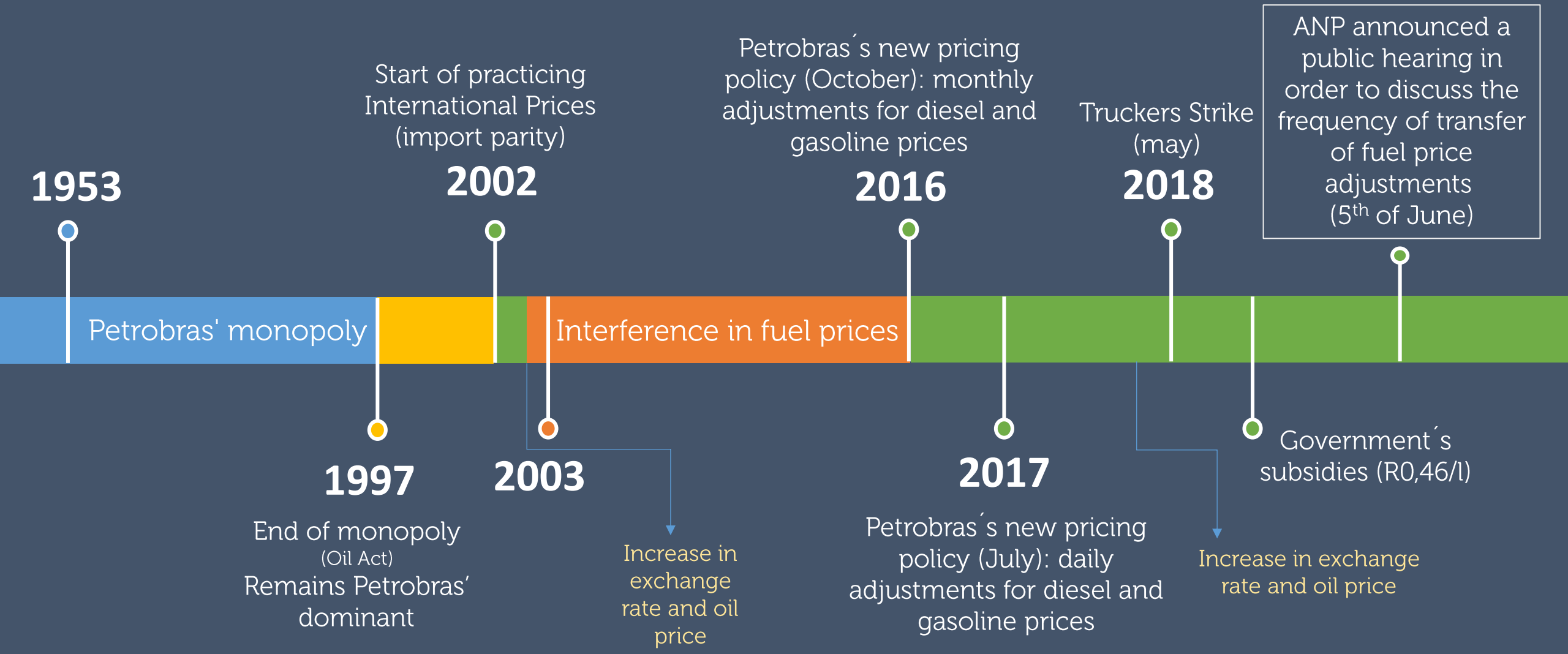
Capacity: 140 thousand bpd

383 Ethanol Mills

Capacity: ~ 570 thousand bpd (33 billion liters)



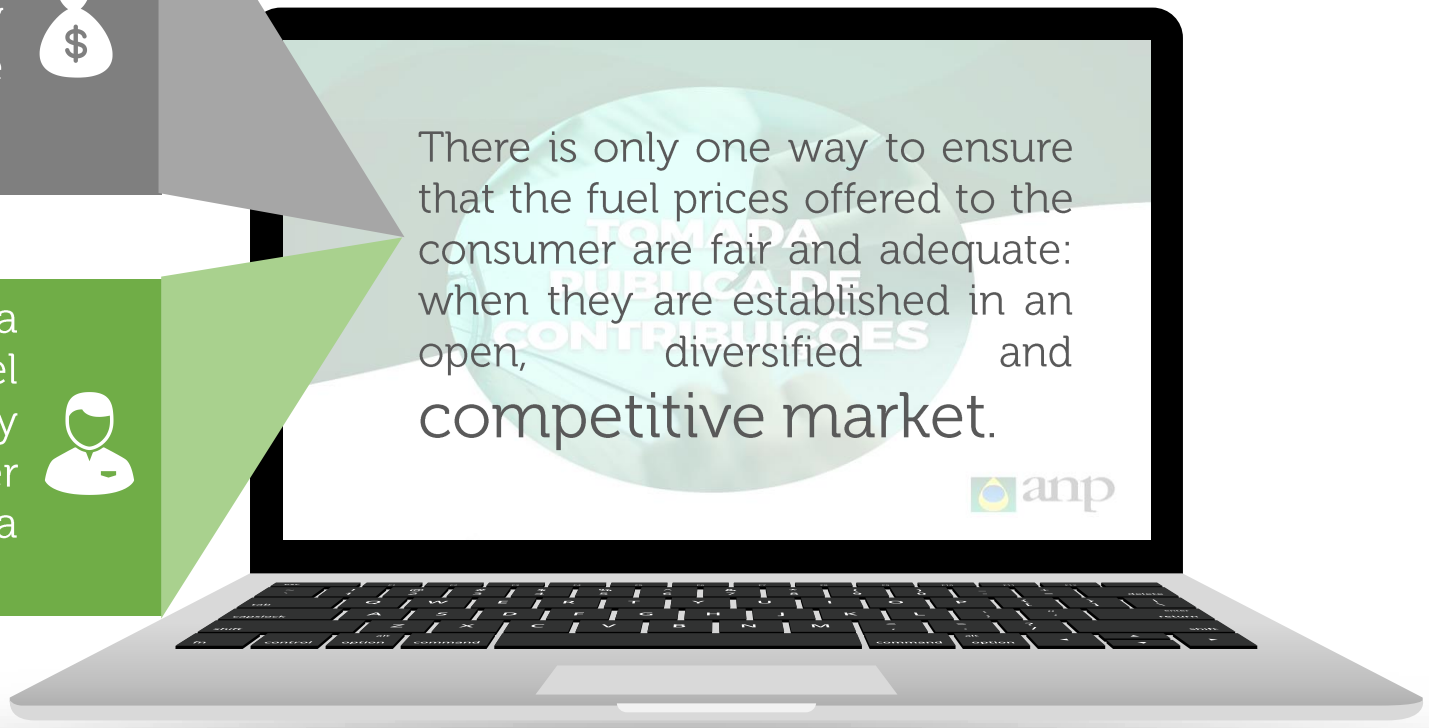
Refining: history of fuel pricing policy



Why the public hearing?

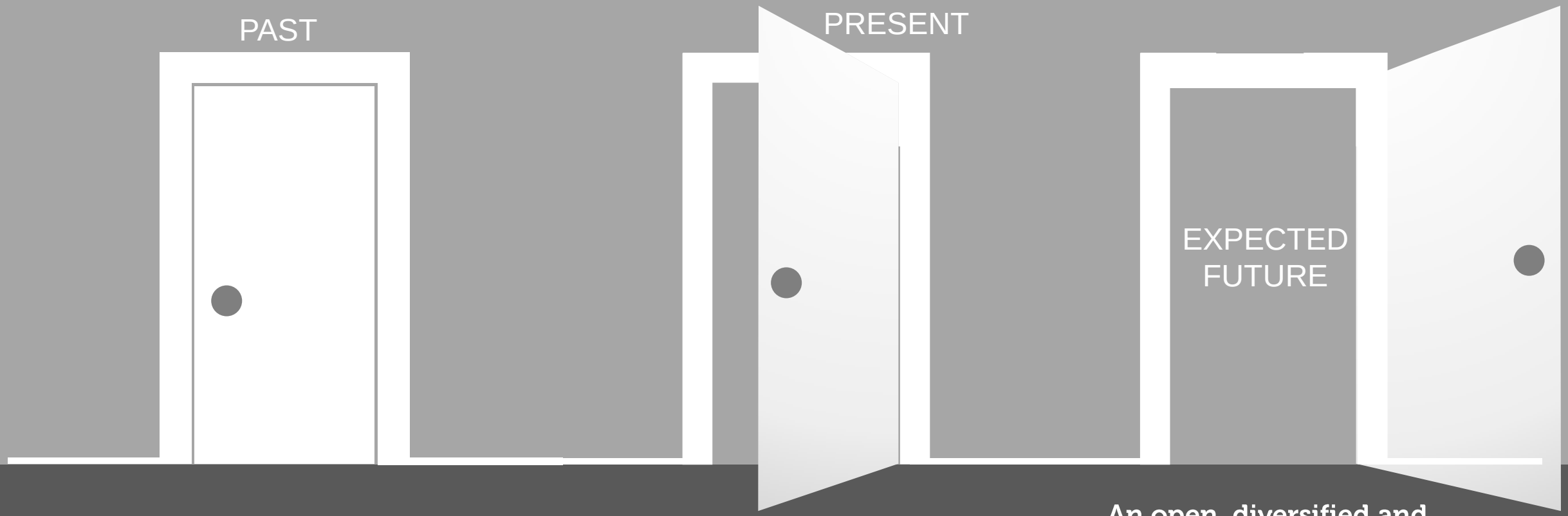
Brazilian society has questioned Petrobras´ price volatility. There are no room for investment in a country when the society is questioning the pricing policy.

Concentrated refining market in a single large company + current fuel taxation system = need of regulatory measures that protect the consumer and preserve the key values of a market economy.



The public hearing proposes to build a joint and transparent solution with the companies and the society, stabilizing the scenario for staid discussions. There is NO intention to interfere in the freedom of price formation, which is established in the Brazilian legislation

Creating an open and competitive market



Monopoly

- Interference in Petrobras´s pricing policy
- Investment needs
- Import dependency

***De facto* monopoly**

- Import Parity
- Risk of new price controls or adoption of anticompetitive practices
- Investment needs
- Increase in import dependency

An open, diversified and competitive market with multiple players

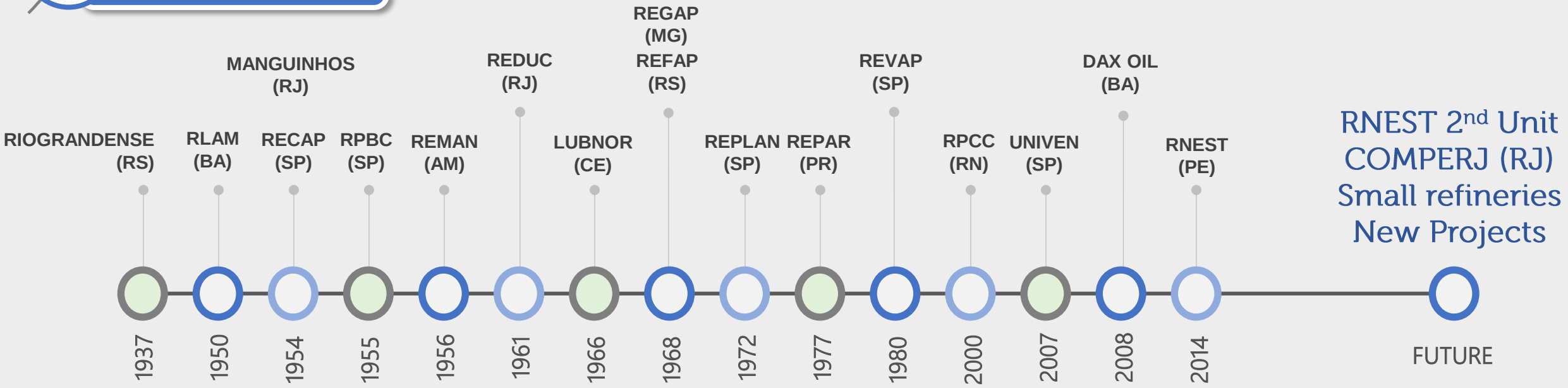
- Market Price
- New Investments
- Increase in national production and reduction in import dependency

Refining: perspectives

Increase of competitiveness and capacity by:
- gradual increase in third-party participation with the market´s growth or
- process acceleration through Petrobras' partnerships / divestments

Conclusion of stopped projects / new refineries

Small refineries



Opportunities in the refining sector

PETROBRAS´ DIVESTMENT PLAN

INTERNATIONAL PRICES

DEMAND GROWTH

LOGISTICS INEFFICIENCY

Gasoline/diesel imports: ~ 4 to 6 US$/bbl
Oil exports: ~ 2 to 4 US$/bbl
Total potential by barrel of oil product: ~ 6 to 10 US$

INCREASE IN OIL EXPORTS

Petrobras proposed model consists in partnerships in 2 regional blocks of relevant size

	Northeast 60%	South 60%
Refineries	RNEST and RLAM	REPAR and REFAP
Processing capacity	430 kbpd	416 kbpd
% of total refining capacity	19%	18%
Pipelines	2 of crude oil 13 of fuels	9 pipelines
Terminals	3 inland 2 waterway	3 inland 4 waterway
Other aspects	RNEST 2nd unit	Mature market

Source: Petrobras

Opportunities for **investments** in refining involve the demand growth and Petrobras´ divestment plan. They depend on the practice of market prices and can benefit from the cost of the logistical tour

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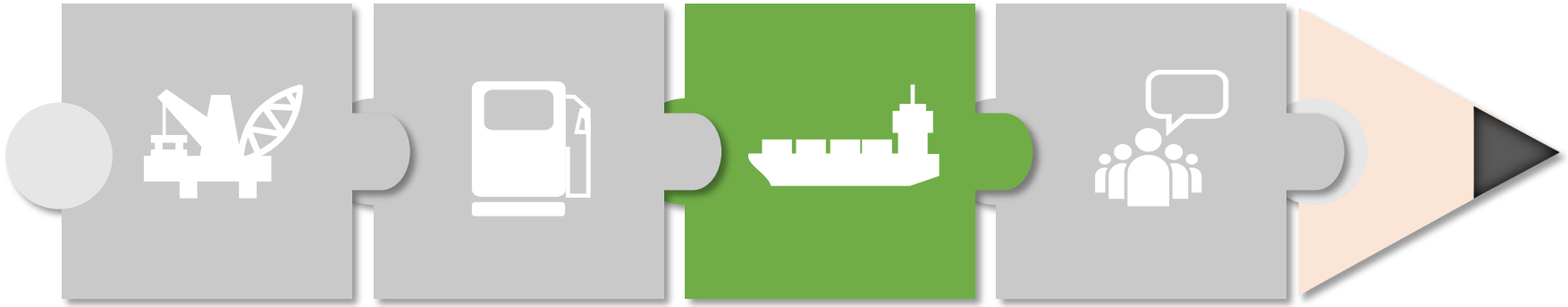
03 LNG AND GAS MARKET

Domestic or imported gas?



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The gas market in Brazil

March 2018

SUPPLY

80 Million m³/d

Domestic Supply 52 — 66%

Imports from Bolivia 25 — 31%

LNG Imports 2.4 — 3%

DEMAND

73.5 Million m³/d

Consumption by Sector

Industrial 38.9 — 53%

Power Generation 23.4 — 32%

Automotive 6 — 8%

Cogeneration 2.8 — 4%

Others 2.4 — 3%

Gas market scenario

The driving forces

Petrobras' repositioning

Development of pre-salt fields and new gas areas, increasing the natural gas domestic production in the future

Increase of renewable in the electricity generation, demanding natural gas thermal power plants as back up systems

In progress...

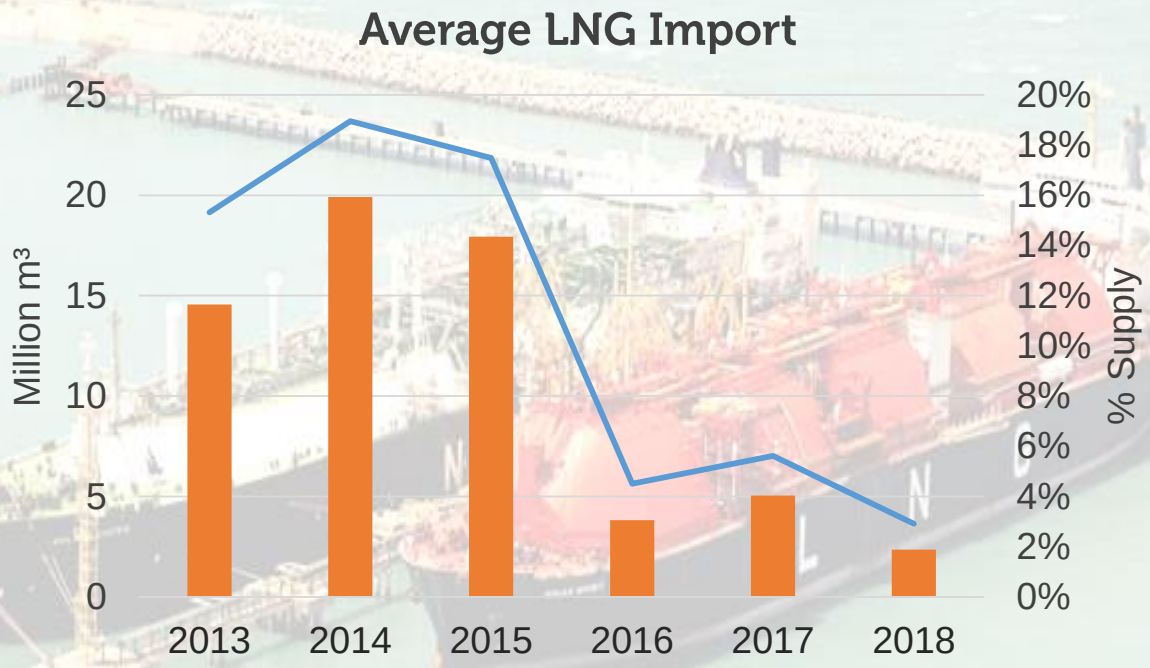
Gas to Grow

The draft bill proposed in 2017 sets a "Market Design", aiming a liquid, diversified and competitive natural gas market

The transition is already being implemented: 2018 Open-season for Bolívia-Brasil Pipeline capacity offering (entry-exit regime)

Regardless of the gas bill approval, the ANP will continue to implement regulatory measures to modernize and open the gas market

The LNG market



01 Opening of LNG terminals for third parties

02 Project Opportunities with combined supplies (LNG, domestic gas)

LNG shall be used as a bridge until domestic natural gas is available. In the future, natural gas abundance can turn Brazil into a LNG exporter.

03 LNG terminals: Pecem-CE, Bahia de Guanabara-RJ and Bahia

Opportunities for LNG in Brazil will continue to exist

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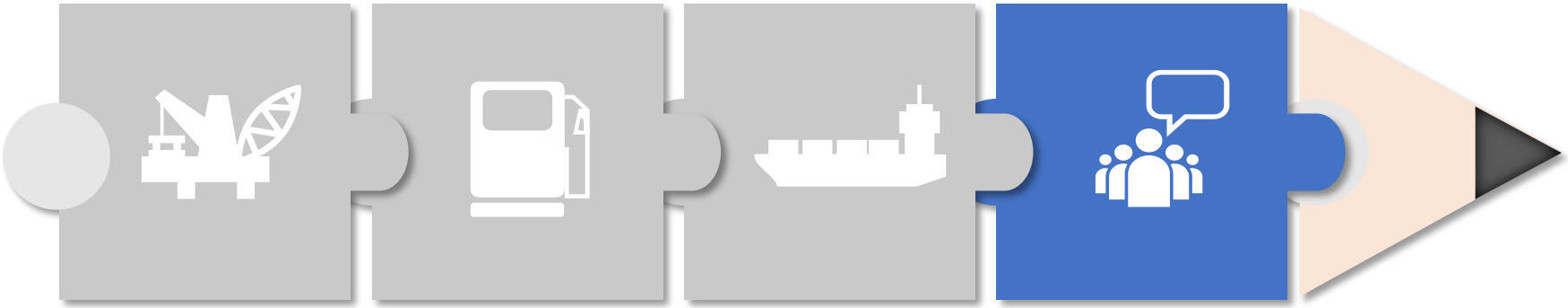
03 LNG MARKET

Opportunities



02 REFINING

What is ongoing in Brazil and opportunities

04 FINAL REMARKS

Potential Investments in the O&G Industry

Sector	Investments (US$ billion)	Investments (R$ billion)
E&P	490	1,813
Refining, Processing and Petrochemical Plants	58	216
Biofuels	28	105
Pipelines	10	35
Logistics Supply	8	31
Total	**594**	**2,200**

*Exchange rate – R$3,70/US$

"How much investments in the Oil, Gas & Biofuels Industry would be necessary to develop all the Brazilian potential in the next 10 years?"

O&G scenario in 2018

Unique E&P opportunity:
- immediate reserves certification
- fast production development
- reserves and production growth

First ever effective opening in the natural gas business

Creation of a competitive, open, diverse and internationally referred refining and fuels market

Development of a diverse and competitive supply chain and services market

Bidding round schedule and open acreage

Brasil-Rounds
Oil & Gas Bidding Rounds

Need of additional service companies

Diverse and Competitive E&P Market

Petrobras divestment plan

BR

Improvements in the energy policy

The greatest transformation in the Brazilian E&P sector, completing the opening which started in 1997

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