



IGU Committee Meeting (WOC1 and PGC A)

February 19th 2013
Rio de Janeiro, Brazil



GLOBAL MARKET RECENT DYNAMICS

GLOBAL GAS RECENT EVENTS AND UNCERTAINTIES

Shale Gas in USA:

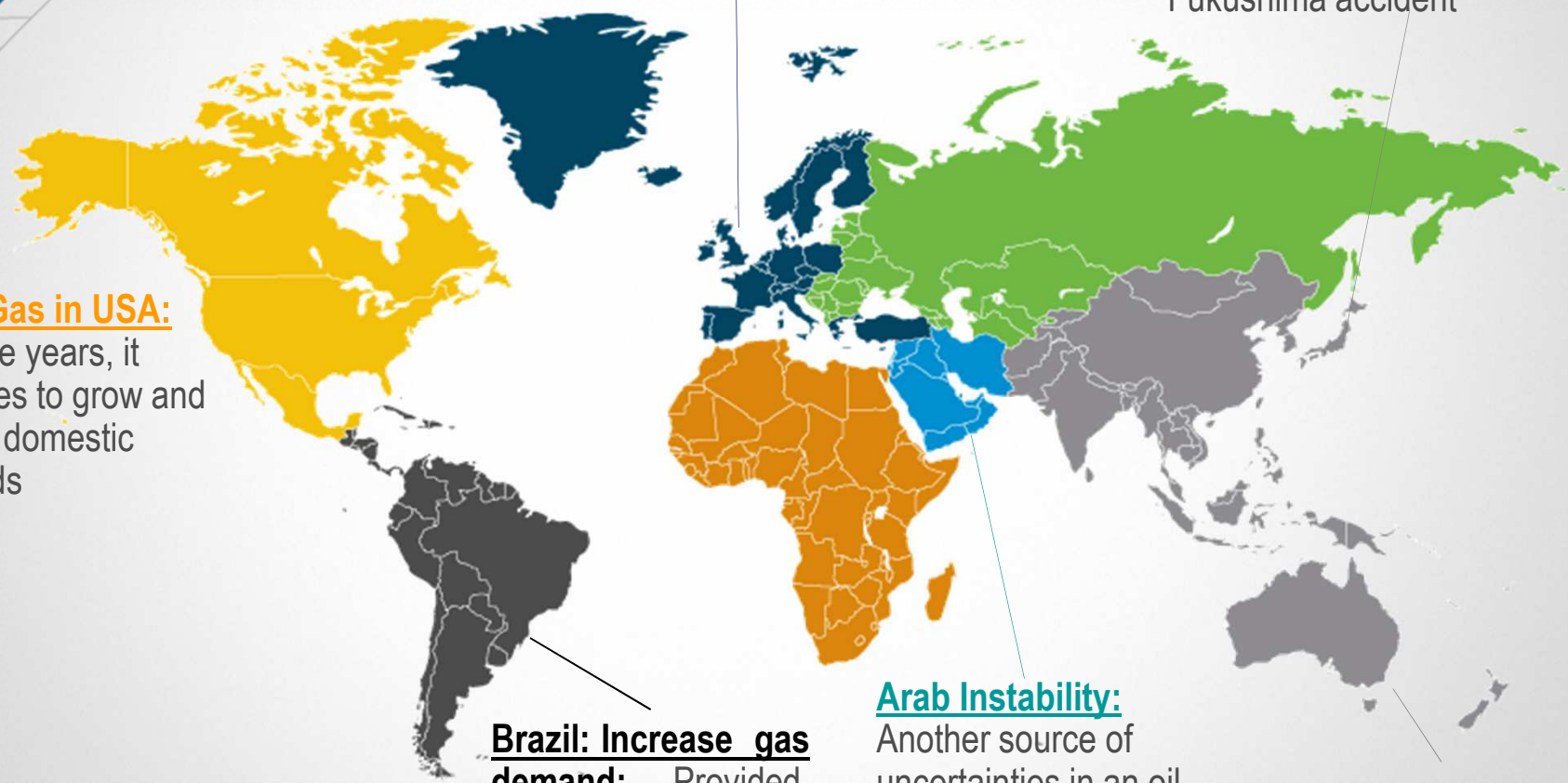
After five years, it continues to grow and change domestic demands

Euro Zone Crisis:

Growth and energy demand in a slow pace contaminating other countries and still discussing shale gas development

Japan Earthquake:

A huge impact in gas and energy and nuclear debate after the Fukushima accident



Brazil: Increase gas demand: Provided, mainly, by Thermo power generation

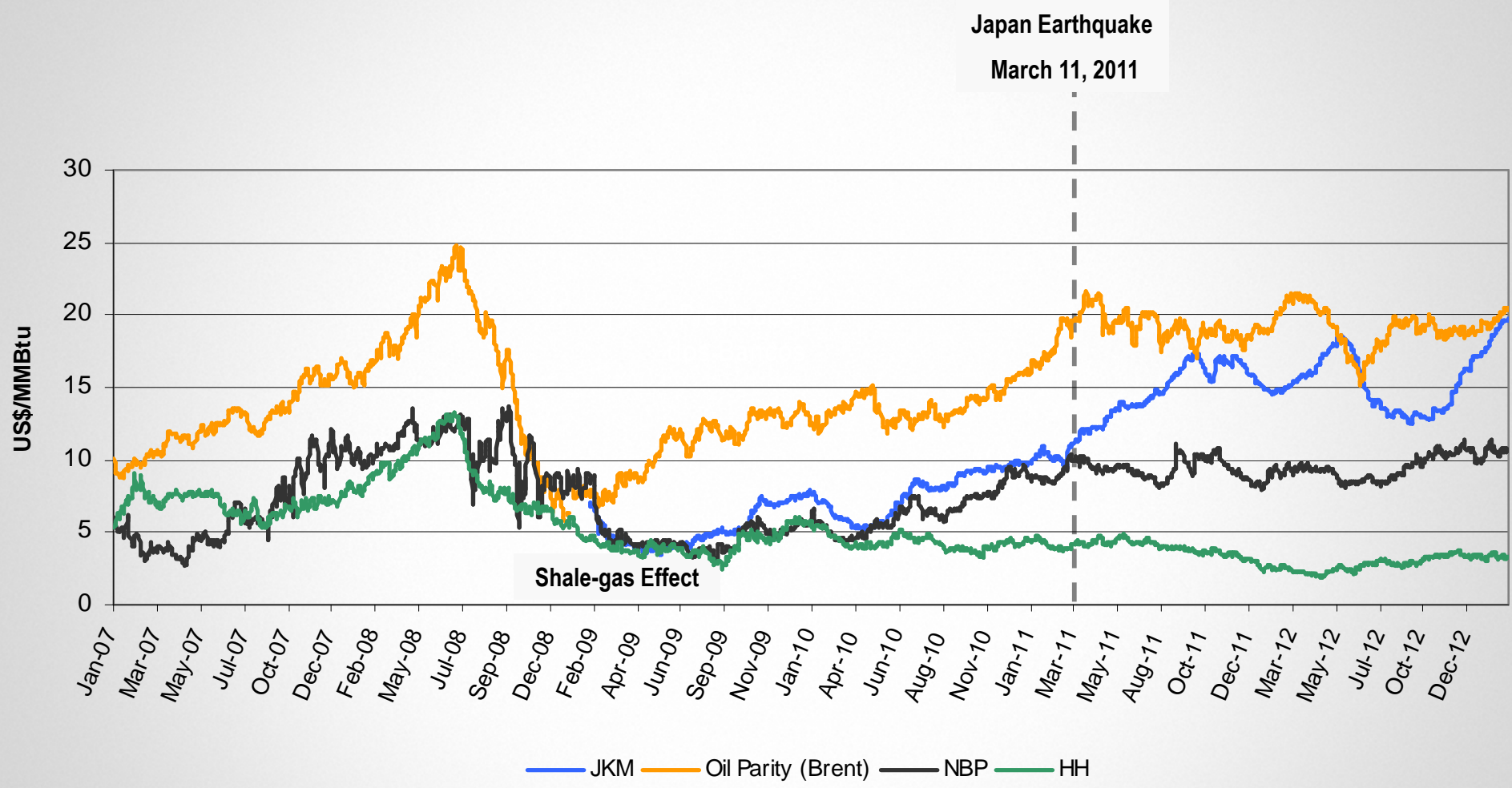
Arab Instability:

Another source of uncertainties in an oil linked global gas prices

Australia:

It can become a big player in LNG Market

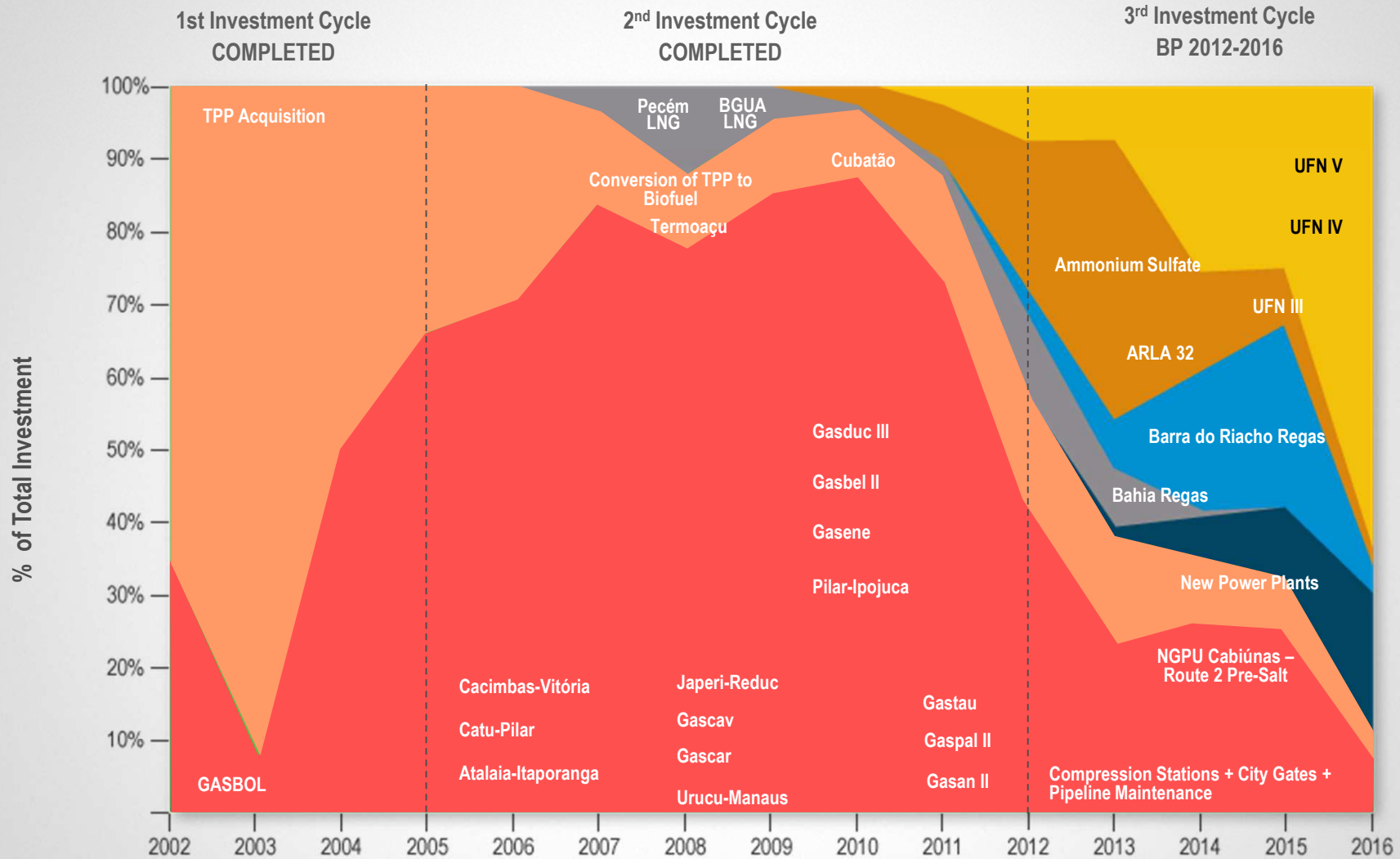
HENRY HUB & LNG SPOT PRICES



Source: IAEA, JAIF, NIW (Energy Intelligence) / Waterbourne (Thomson Reuters), EIA - DoE – February 2013

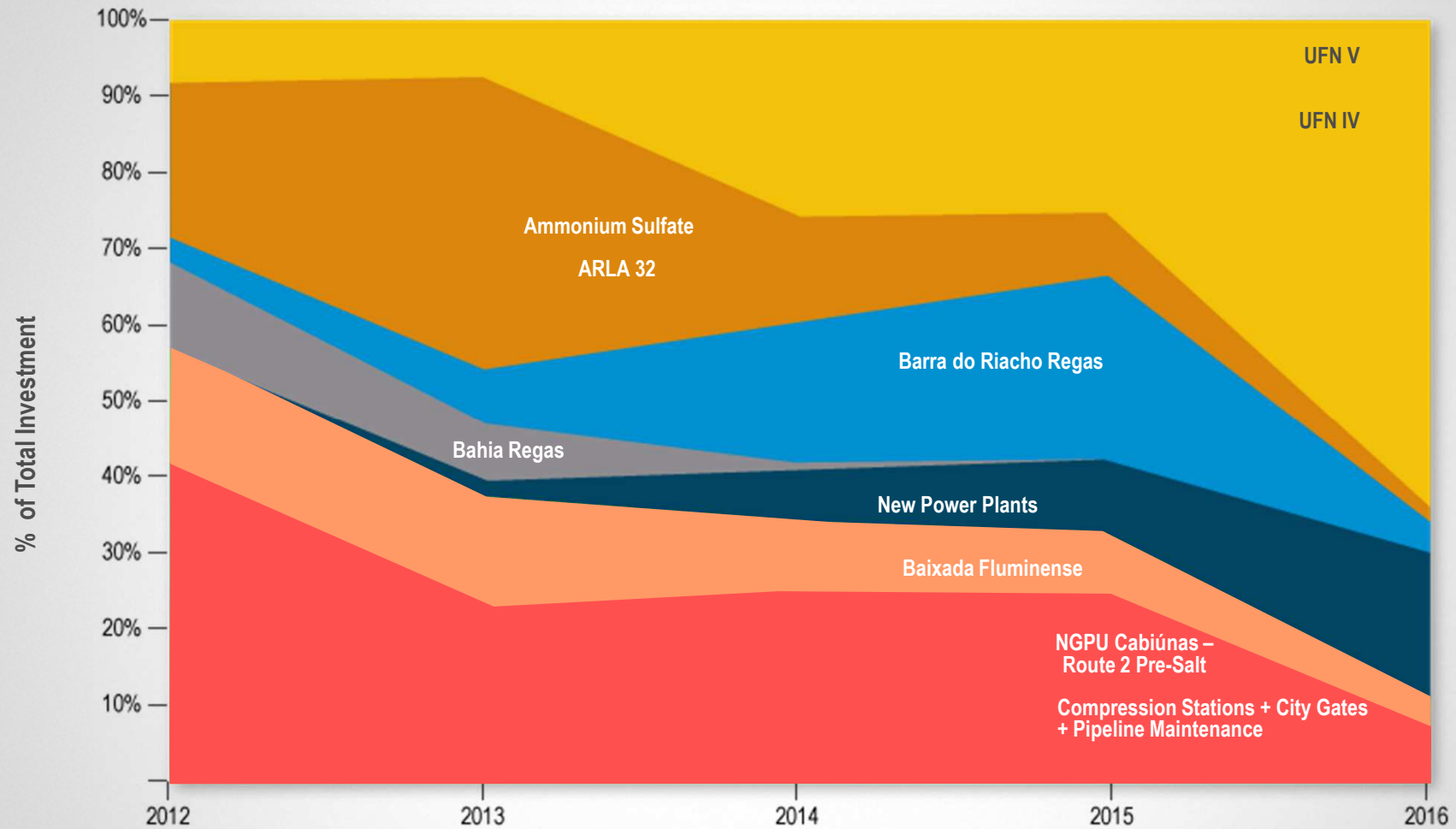
NATURAL GAS MARKET IN BRAZIL

INVESTMENT CYCLES



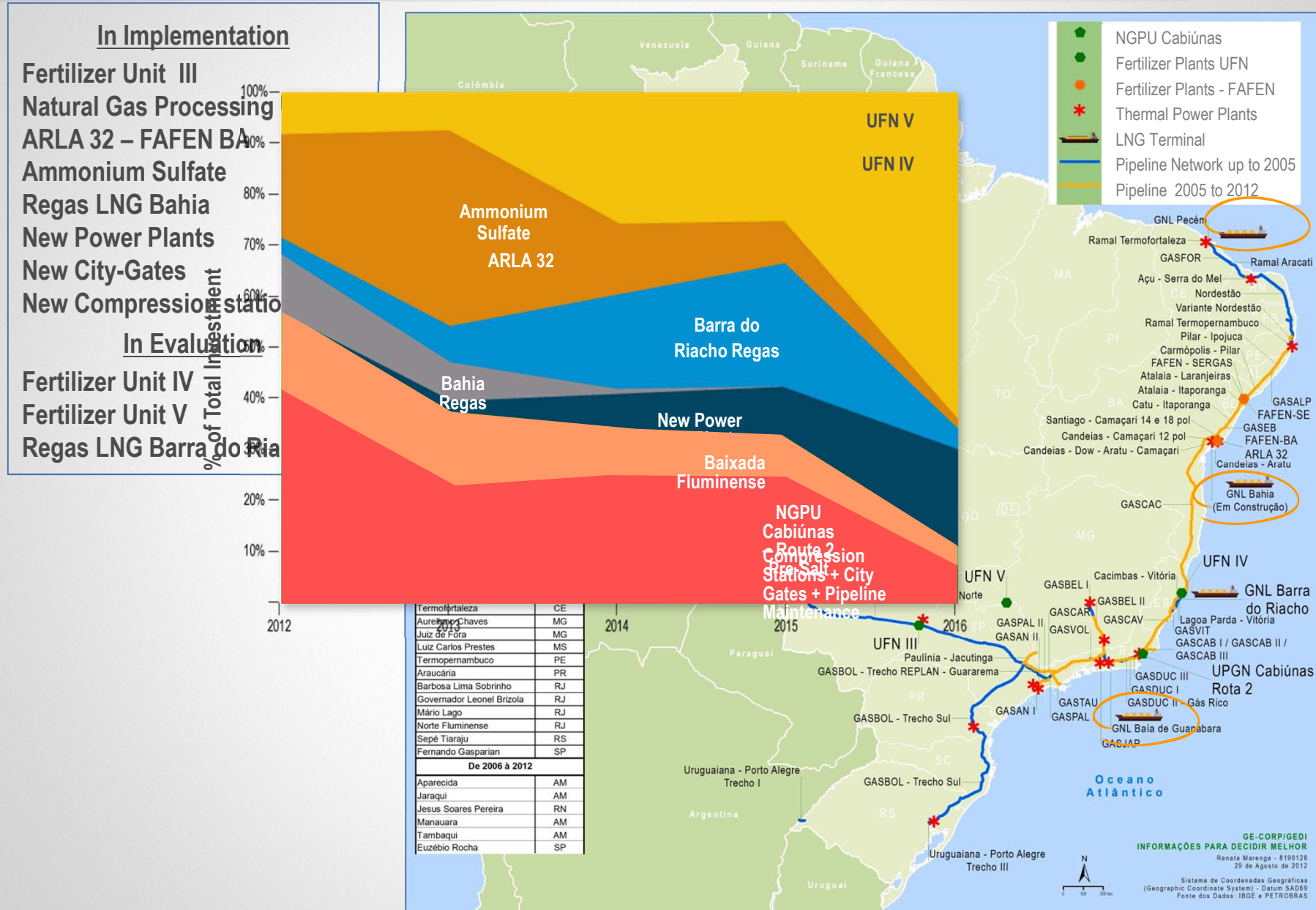
- Natural Gas Logistics
- Electric Energy Generation (under implementation)
- Electric Energy Generation (under evaluation)
- LNG Regas (Under Implementation)
- LNG Regasification (under evaluation)
- Gas Chemical (under evaluation)
- Gas Chemical (under implementation)

3rd INVESTMENT CYCLE: MONETIZATION OF PRE-SALT RESERVES



- Natural Gas Logistics
- Electric Energy Generation (under implementation)
- LNG Regas (under Implementation)
- LNG Regasification (under evaluation)
- Electric Energy Generation (under evaluation)
- Gas Chemical (under evaluation)
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3rd INVESTMENT CYCLE: MONETIZATION OF PRE-SALT RESERVES

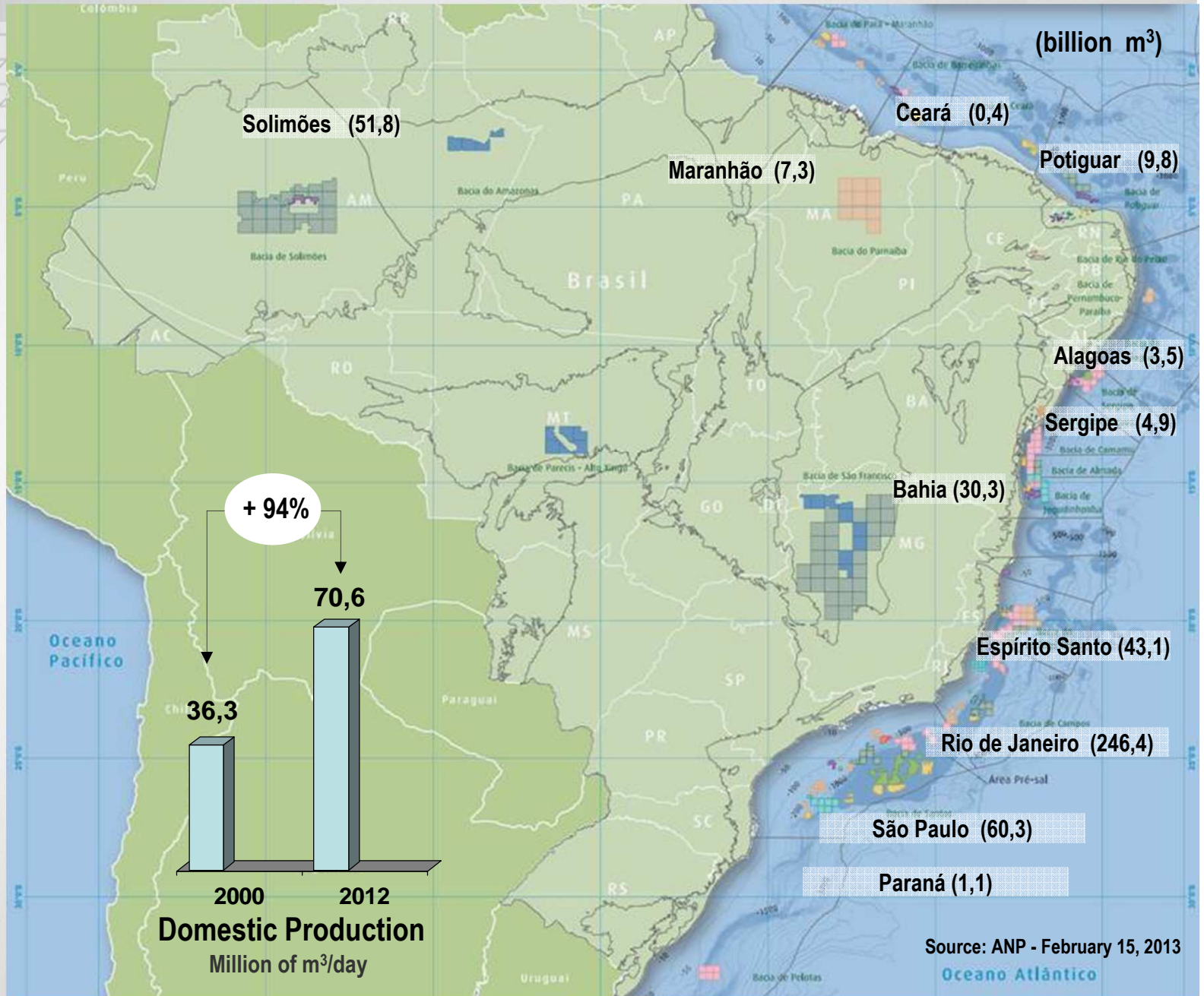


NATURAL GAS PRODUCTION AND PROVED RESERVES BRAZIL



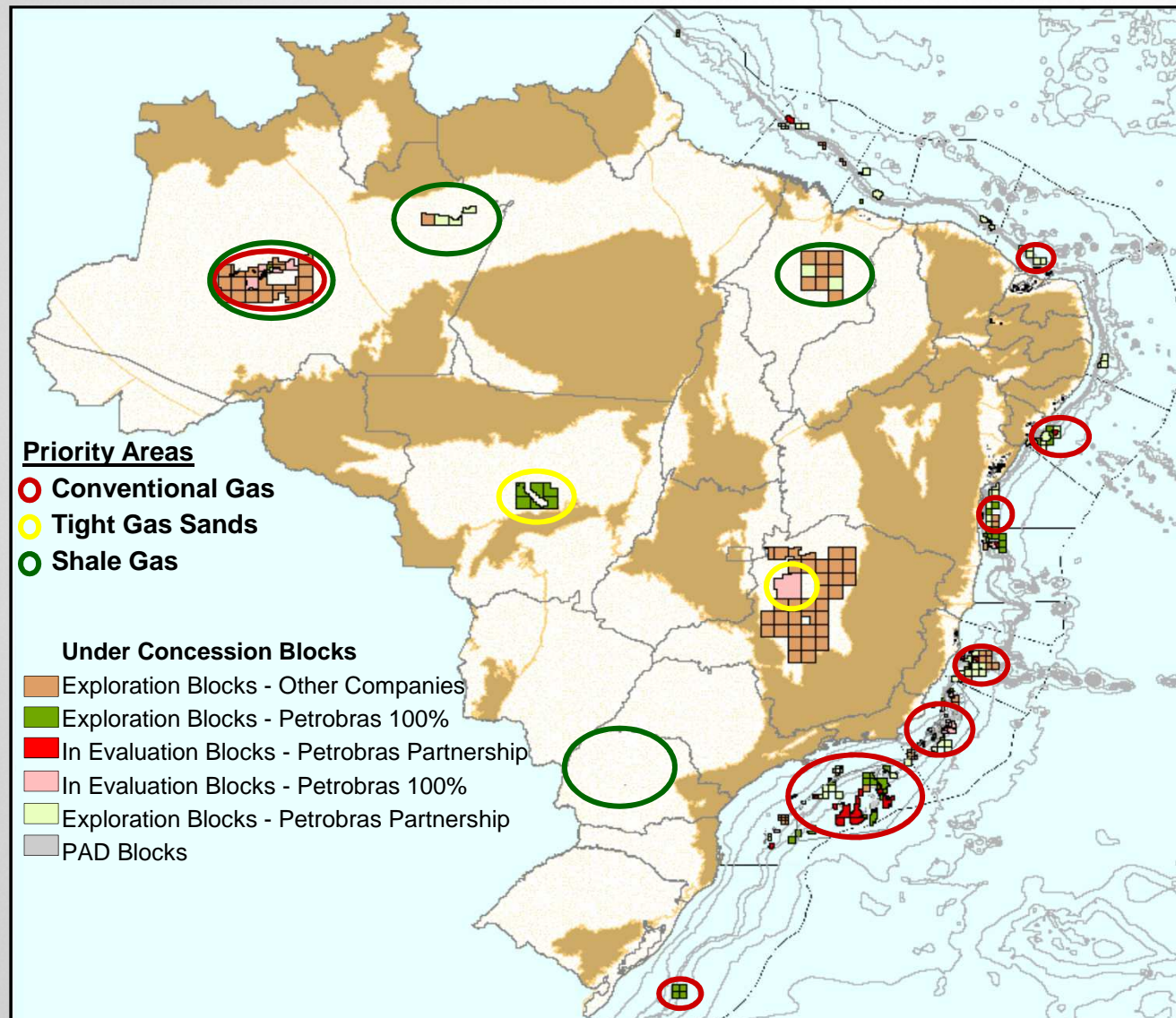
| BRAZILIAN NATURAL GAS RESERVES | | |
|--------------------------------|------|------|
| | 2000 | 2012 |
| Billion m ³ | 220 | 459 |
| Tcf | 7,8 | 16,2 |

+109%



PRON-GÁS: Initiative for reducing exposure to LNG

The program aims to identify the potential of natural gas in terrestrial sedimentary basins in Brazil, in conventional and unconventional reservoirs, and assess the costs for their marketing. → Focus is thermo power generation



Conventional Gas:

- Most Brazilian gas reserves, and
- Technology is dominated.

Tight Gas Sands:

- Reservoirs with low porosity and permeability;
- Technology still needs requires learning and special care with drilling fluids; and
- Complex completion operations.

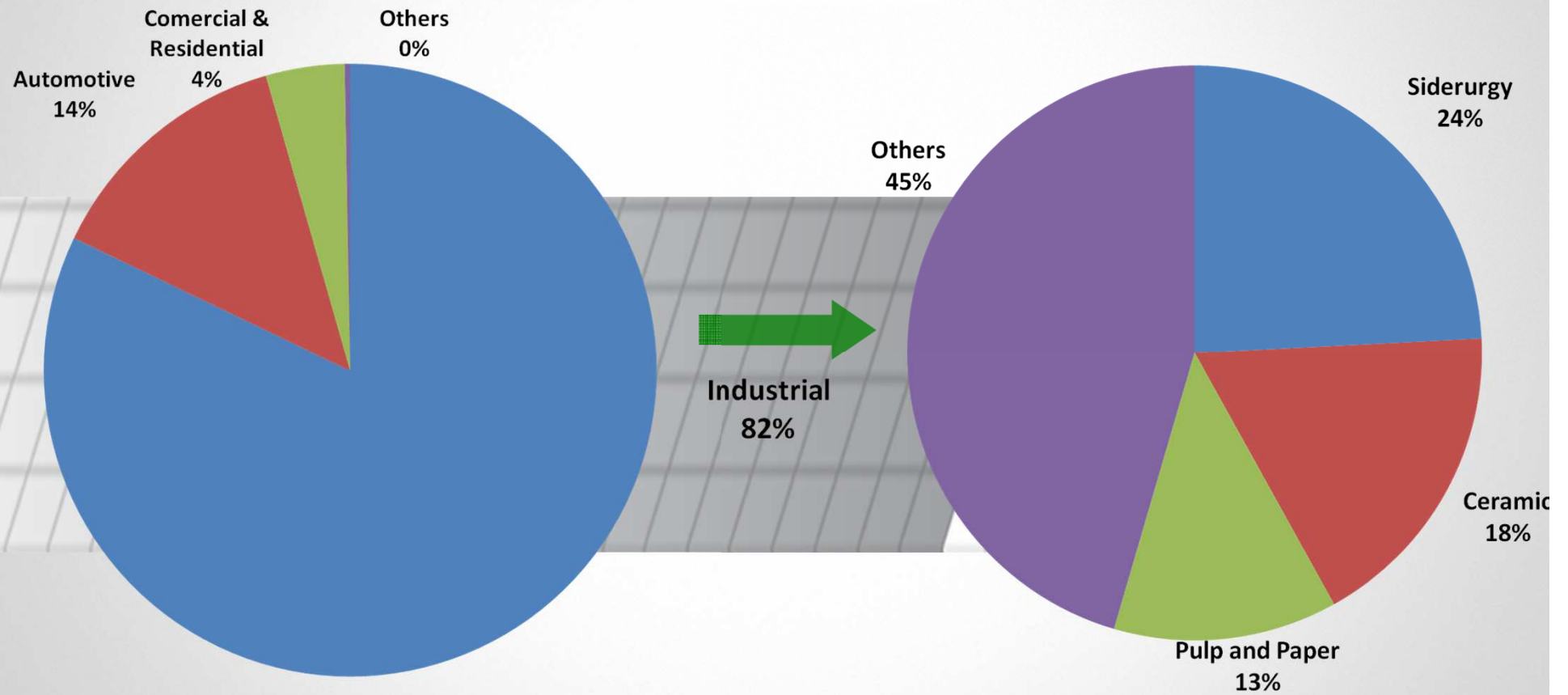
Shale gas:

- The reservoir is generating rock itself
- Completion requires extensive multifracturing operations in horizontal wells, demanding huge logistics infrastructure for the provision of fluids and solids.

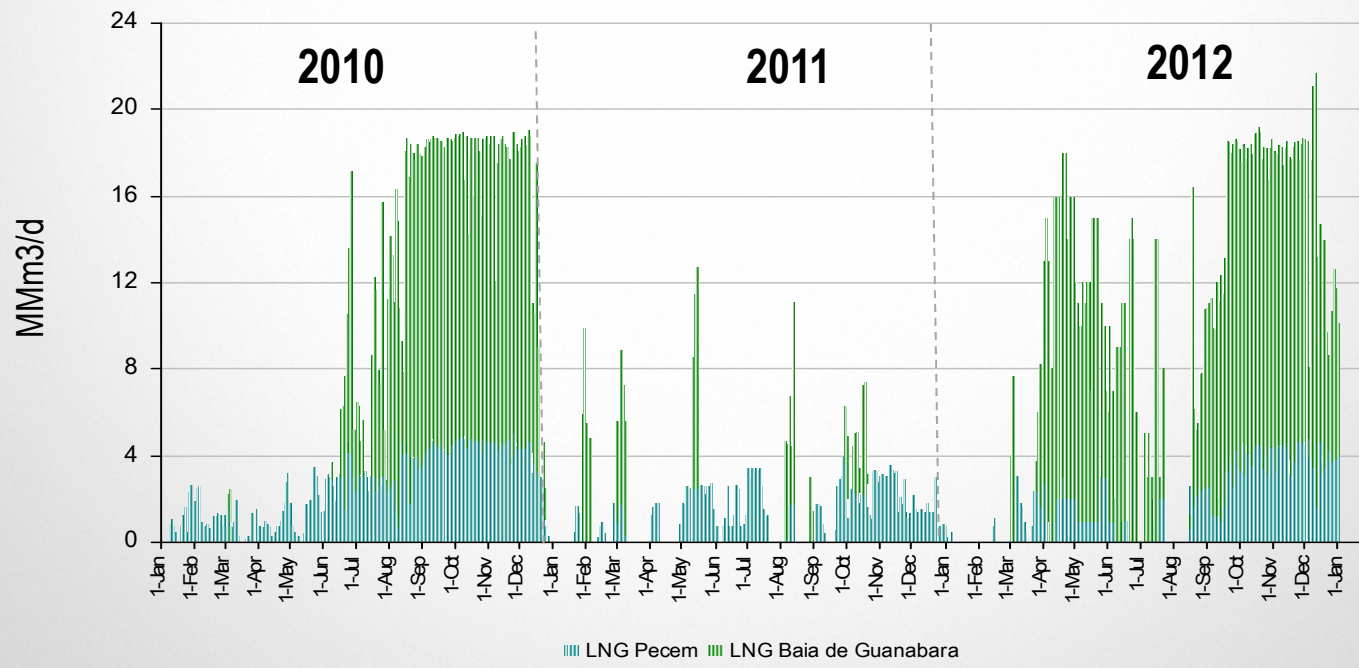
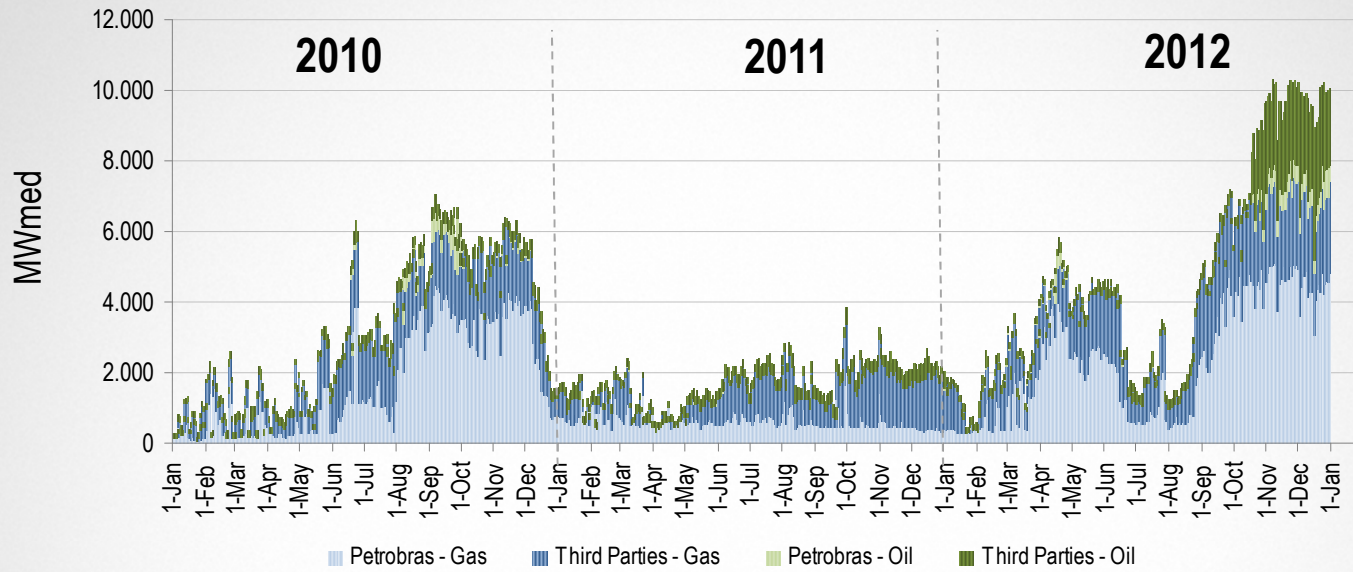
RECENT MARKET DEVELOPMENT IN BRAZIL

NON-THERMOELECTRIC DEMAND IN 2012

Industrial consumers accounted for 82% of Natural Gas consumption



THERMO POWER MARKET: RELATIONSHIP BETWEEN LNG DEMAND AND POWER GENERATION



Source: ONS, 2012

■ LNG Pecem ■ LNG Baía de Guanabara

Creating the Future

2012-2016 Business Plan

NATURAL GAS SUPPLY AND DEMAND

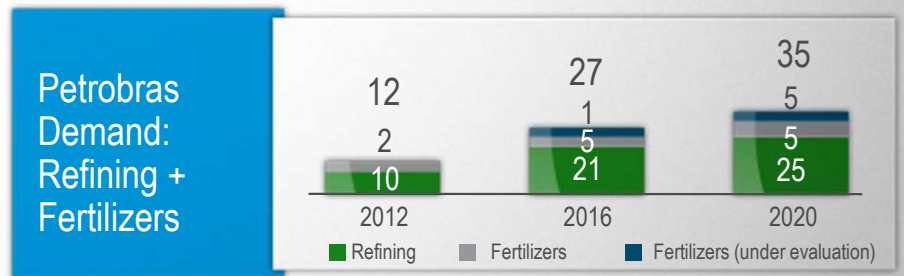
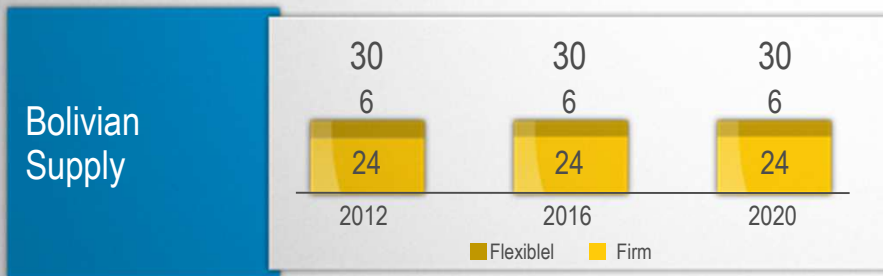
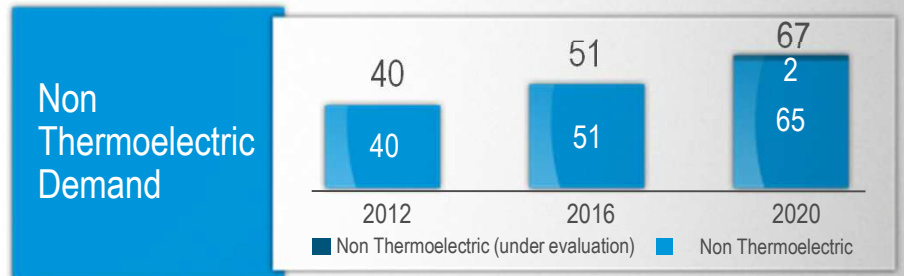
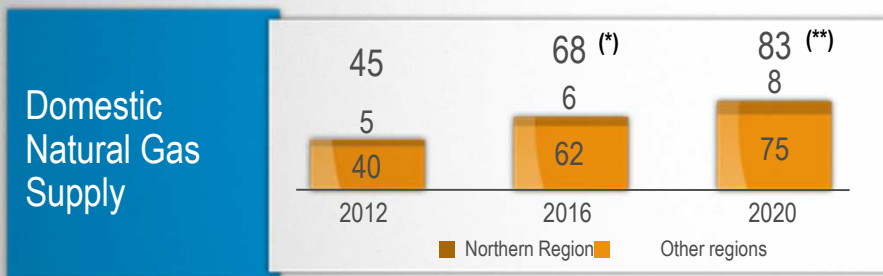
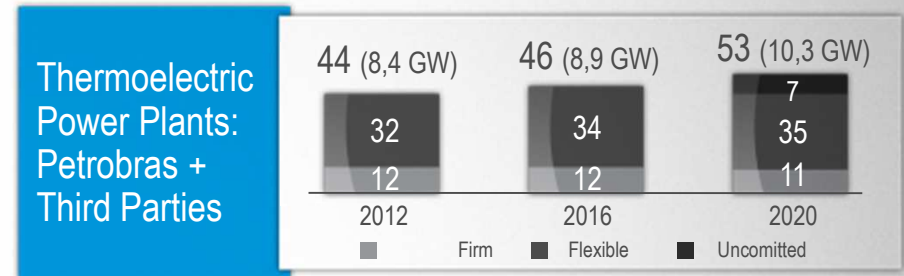
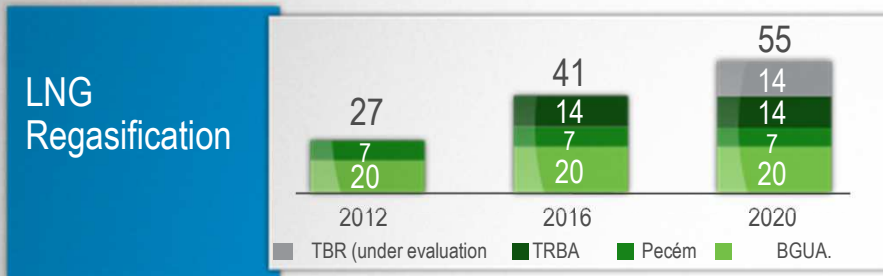
SUPPLY

DEMAND

(*) Pre-Salt Volume: 18 MMm³/d

(**) Pre-Salt Volume: 33 MMm³/d

MILLION m³/d



Total Supply

102

139

168

Total Demand

96

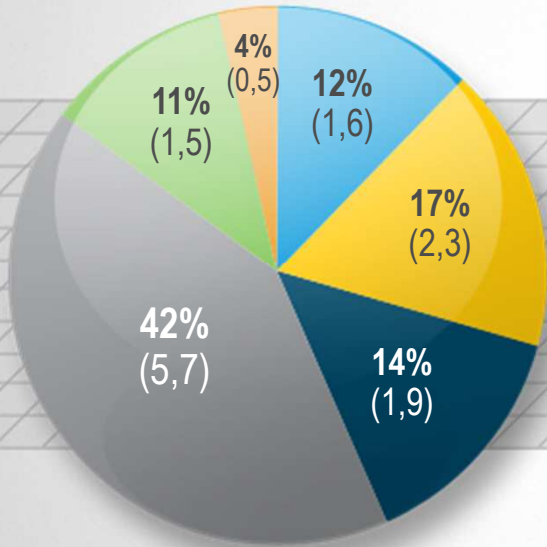
124

155

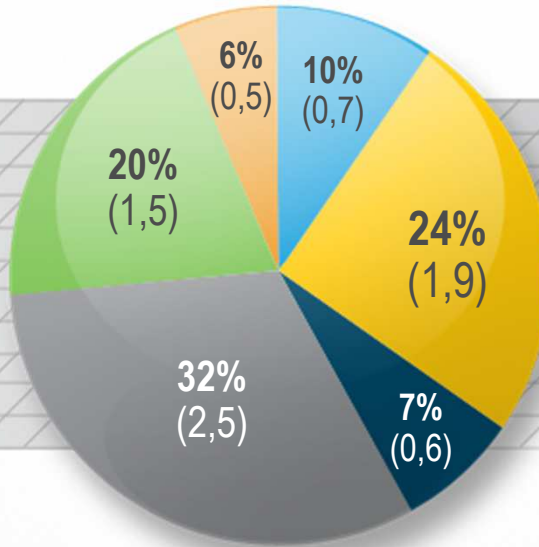
INVESTMENTS 2012-2016

Total = **Under Implementation** + **Under Evaluation**

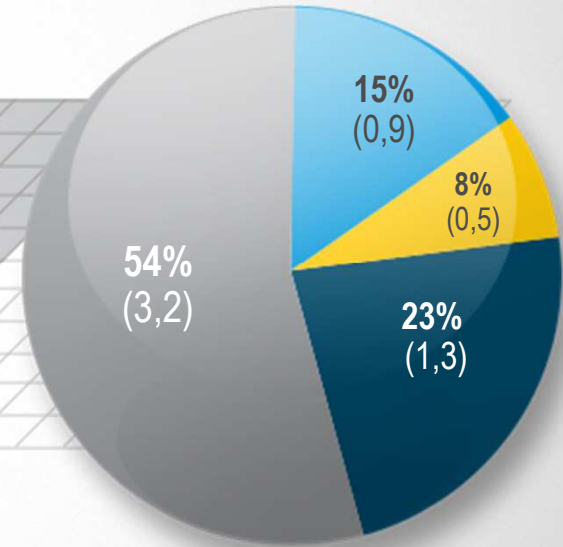
US\$ 13,5 billion



US\$ 7,7 billion



US\$ 5,9 billion



- Expansion - Regasification
- Expansion - Natural Gas Logistics
- Expansion - Power Generation
- Maintenance
- Expansion - Gas Chemical
- Other

CONCLUSION

FINAL REMARKS

PETROBRAS



- **Natural Gas** will remain an important energetic and will continue to expand its share in the global energy matrix
- **Market Maturity** will be improved based on new investments and development of new projects.
- **LNG** will play a decisive role to supply Thermo Power generation.
- **Thermo power demands** will continue to expand, due Brazilian Electrical System is, fundamentally, hydrothermal.
- **Domestic Gas Production, mainly through PRON-GÁS**, can be important play to attend Thermo Power demands.
- **Importation from Bolivia** is an important source to supply Brazilian market.

THANK YOU

José Alcides Santoro Martins
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Gas & Energy
February 2013