



**IGU COMMITTEE
MEETING
(WOC1 and PGC A)**

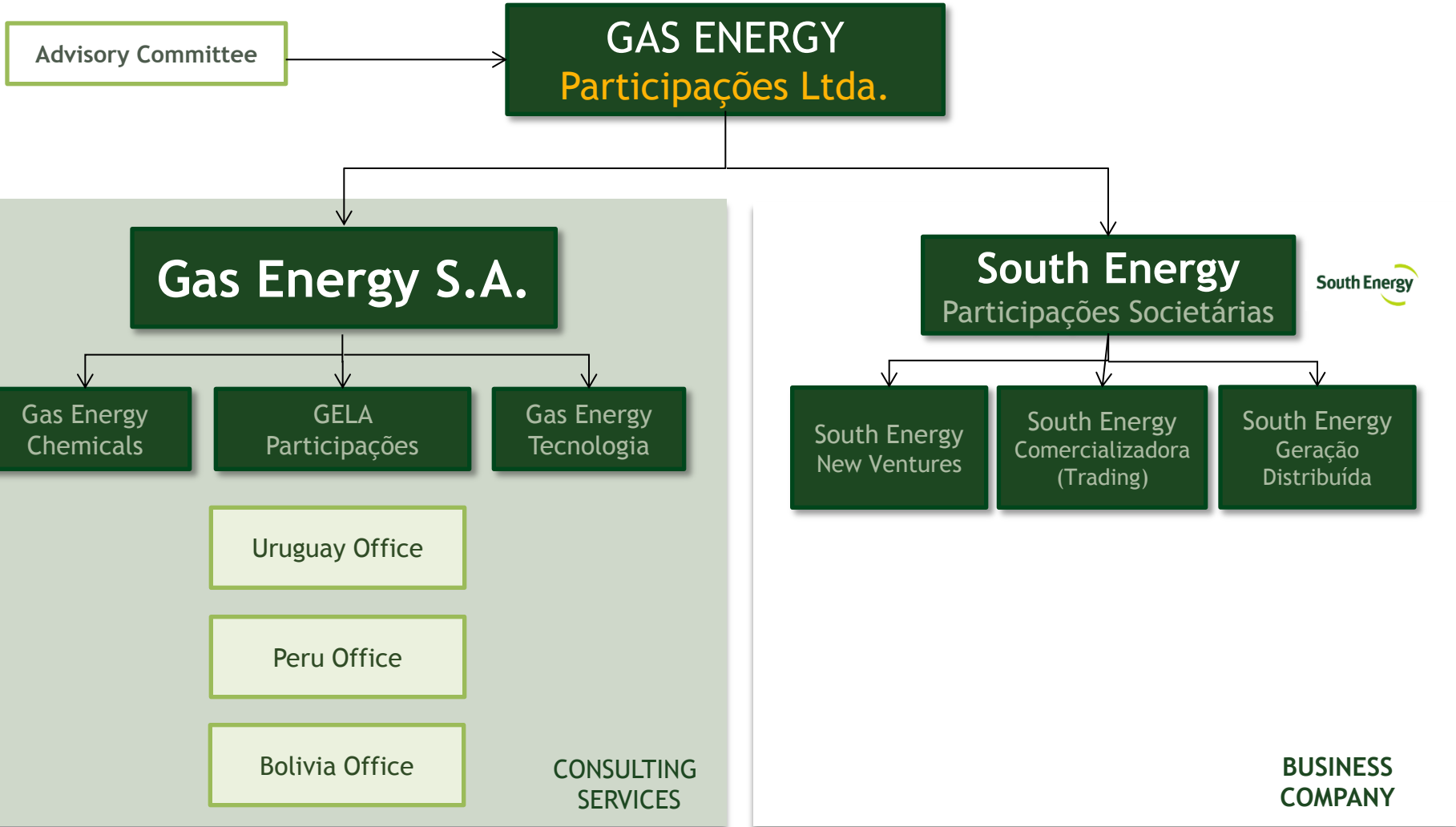
Natural Gas in Brazil and the Challenges of Unconventional Gas

**IGU Committee Meeting (WOC1 and PGC A)
18-21 February 2013, Rio de Janeiro, Brazil**

The Gas Energy Group

Structure of the Gas Energy Group

Diversified Business in the Oil & Gas Value Chain



Client Portfolio - The Entire Natural Gas Value Chain

Exploration and Production



Power Companies



Distribution Companies



Industry / Services



Financial Institutions



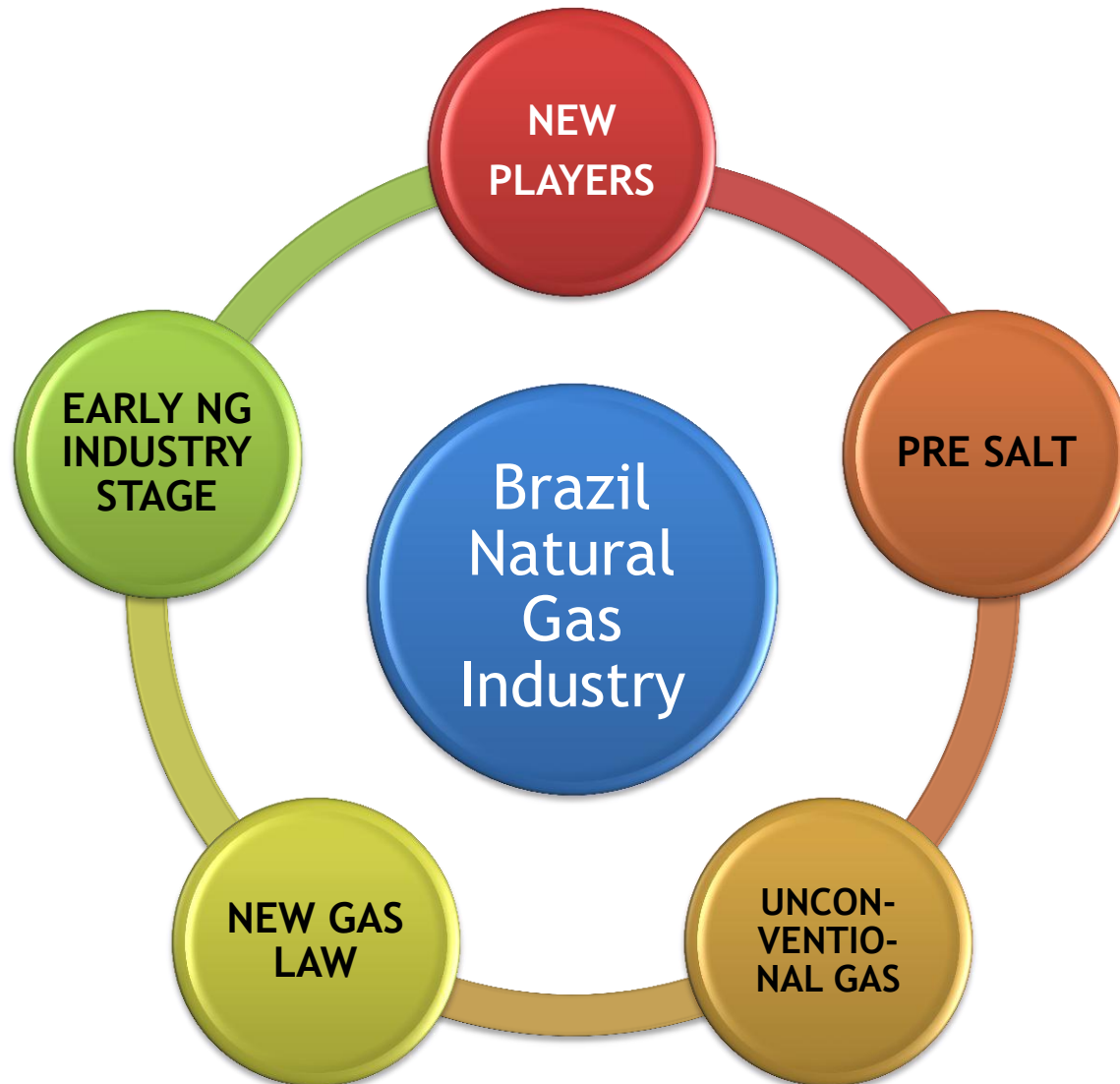
Institutions and Associations



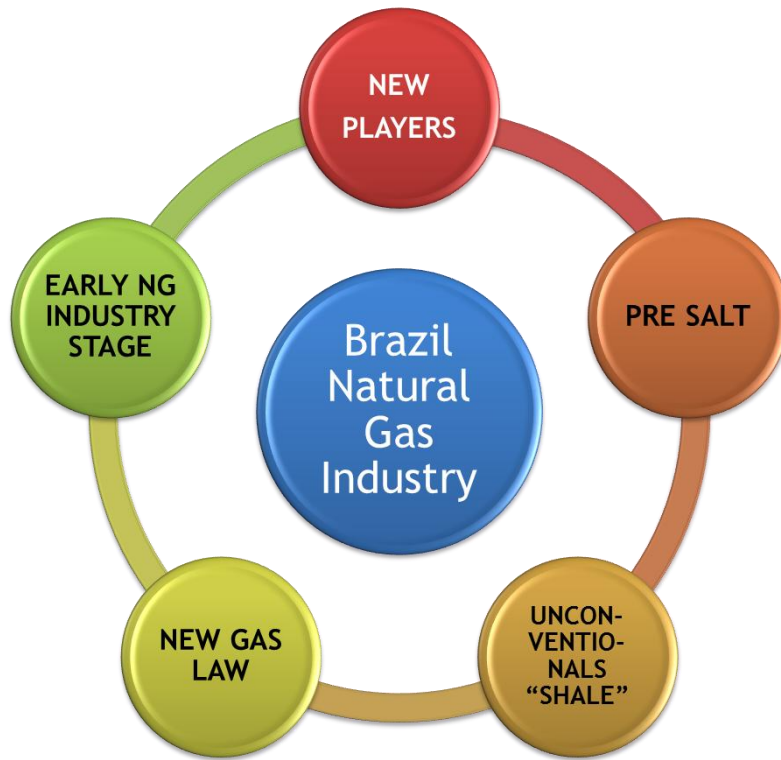
Key Variables for the Brazilian Oil & Gas Industry

New paradigms that changed the
perspective for 2012-2020

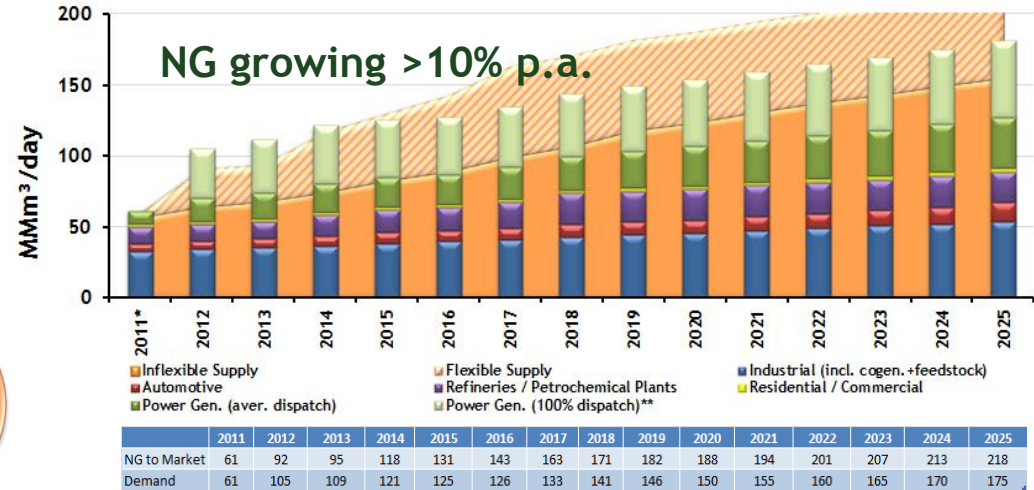
New Paradigms for the Brazil Oil & Gas Industry



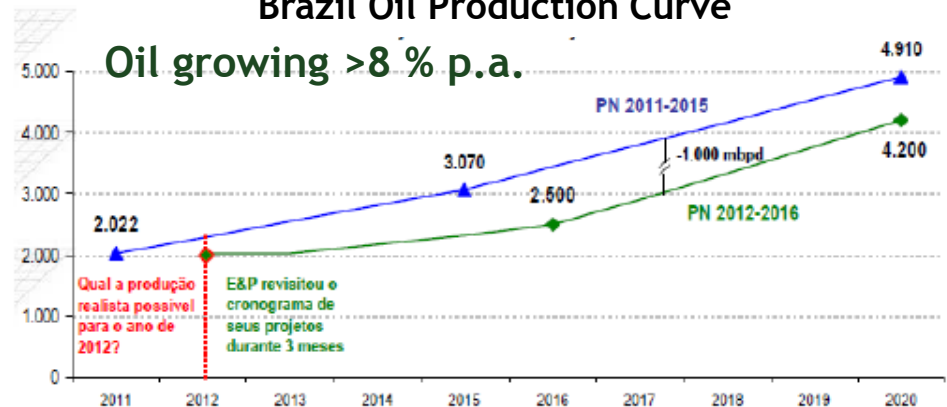
Result → High expected oil & gas production growth in Brazil in 2012-2020



Brazil Natural Gas Supply-Demand



Brazil Oil Production Curve



Source: Petrobras Business Plan 2012-2016

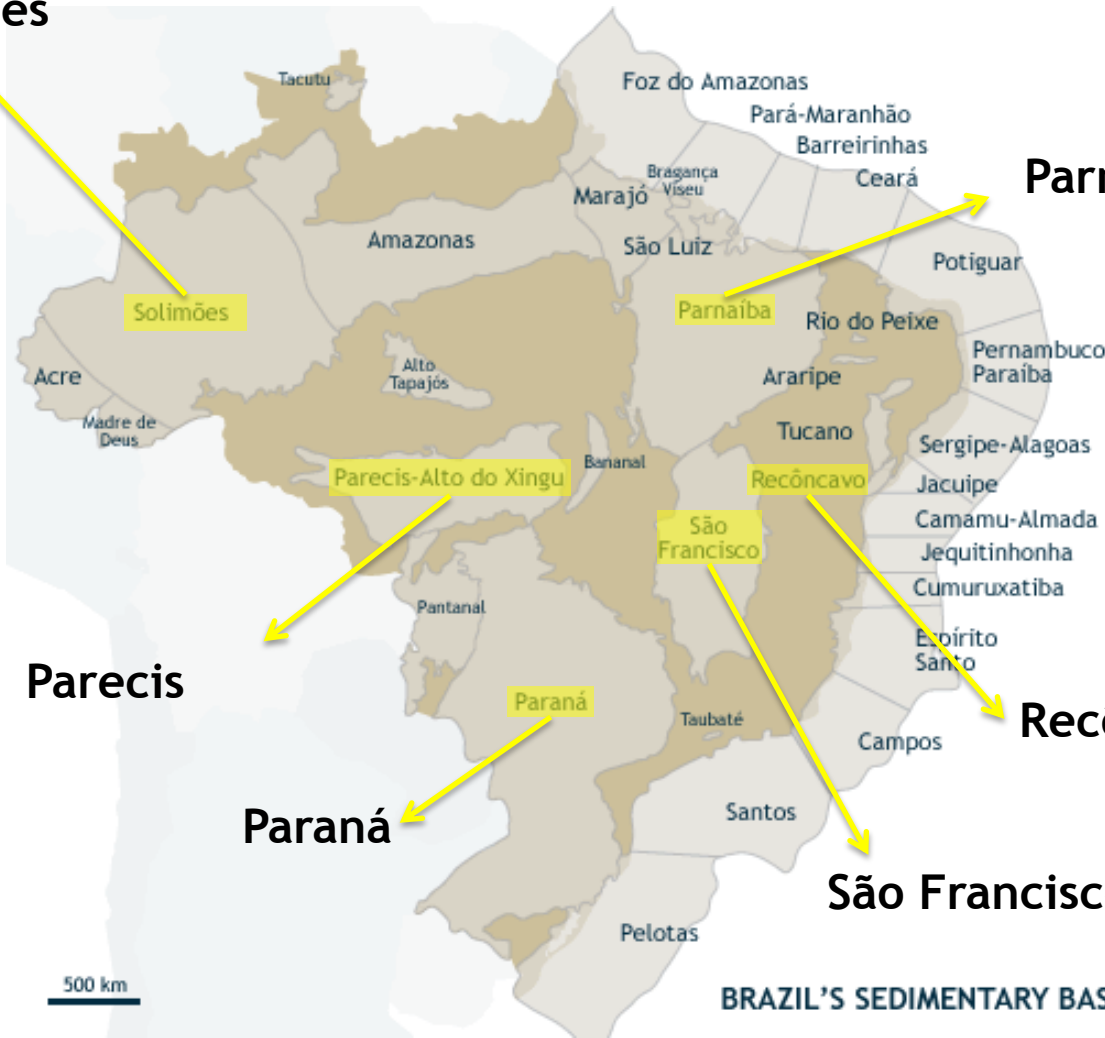
Fonte: Plano de Negócios 2012-2016 Petró

Perspectives for Unconventional Gas in Brazil

Basins with Unconventional Gas Potential

Solimões

Almost
Unexplored
Basins



Parnaíba

Parecis

Paraná

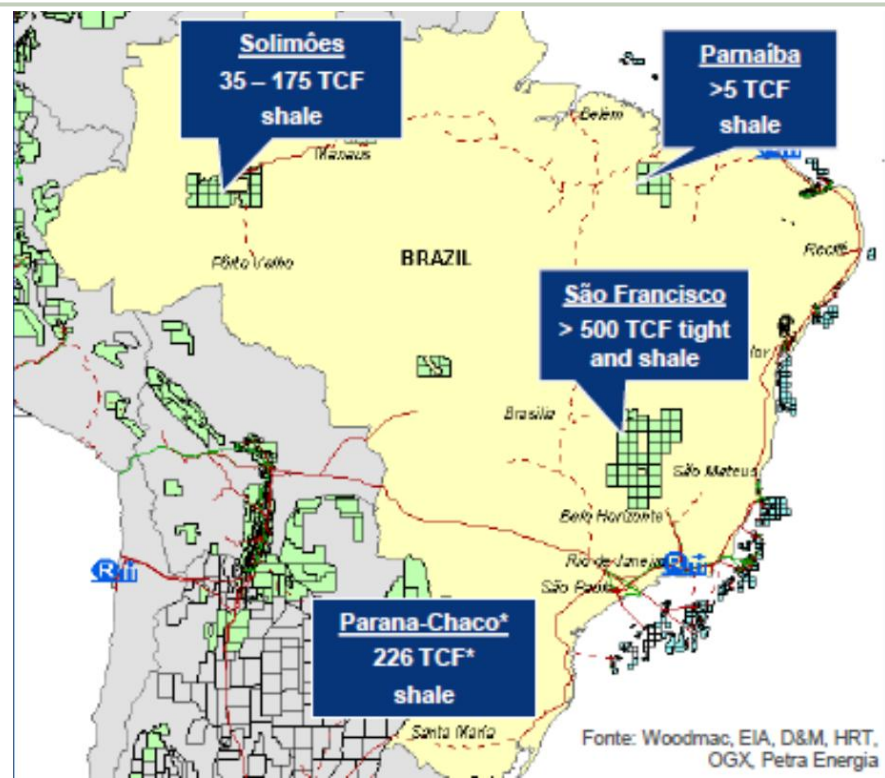
São Francisco

Recôncavo

BRAZIL'S SEDIMENTARY BASINS

Source: ANP

Unconventional Gas: Resource Potential in Brazil



ANP estimates (do not include São Francisco, Paraná and North basins):

- Parnaíba: 64 TCF
- Parecis: 124 TCF
- Recôncavo: 20 TCF

**TOTAL (MAXIMUM):
1.108 TCF**

Market sources estimates:

- Solimões: 35-175 Tcf
- Parnaíba: >5 Tcf
- São Francisco: > 500 Tcf
- Paraná: 225 TCF

Who is who in Brazilian unconventional gas?



São Francisco Basin

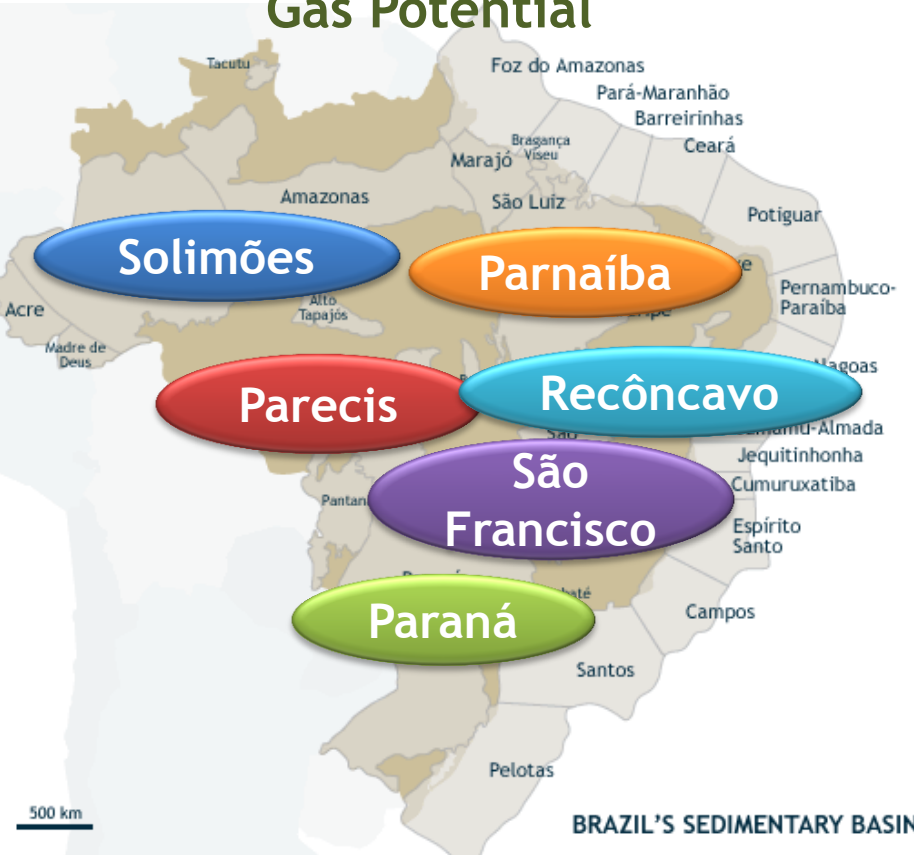
Operator	Wells drilled	Wells being drilled	Wells w/ HC disc.
Petrobras	2	1	2
Petra Energia	11	14	10
Cisco Oil and Gas	-	1	1
Orteng	1	-	1

Solimões Basin

Operator	Wells drilled	Wells being drilled	Wells w/ HC discoveries
Petrobras	6	8	8
HRT O&G	7	5	7

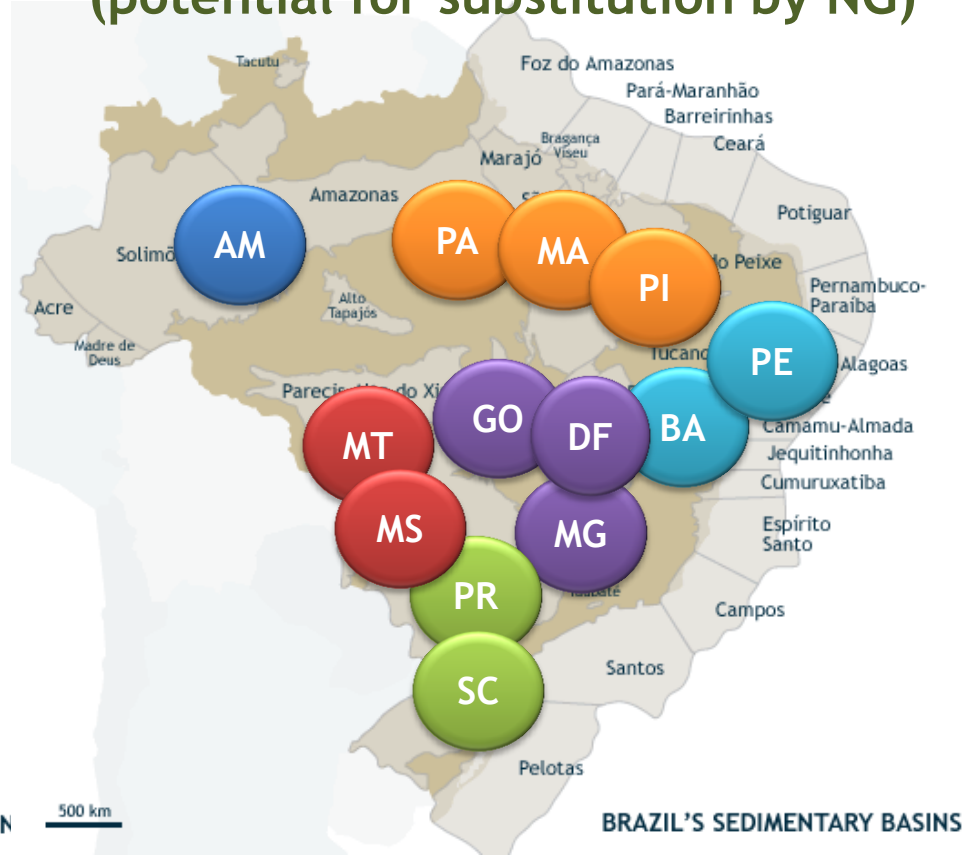
Markets for Unconventional Gas Industry (including co-generation)

Basin with Unconventional Gas Potential



**TOTAL (MAXIMUM):
1.108 TCF**

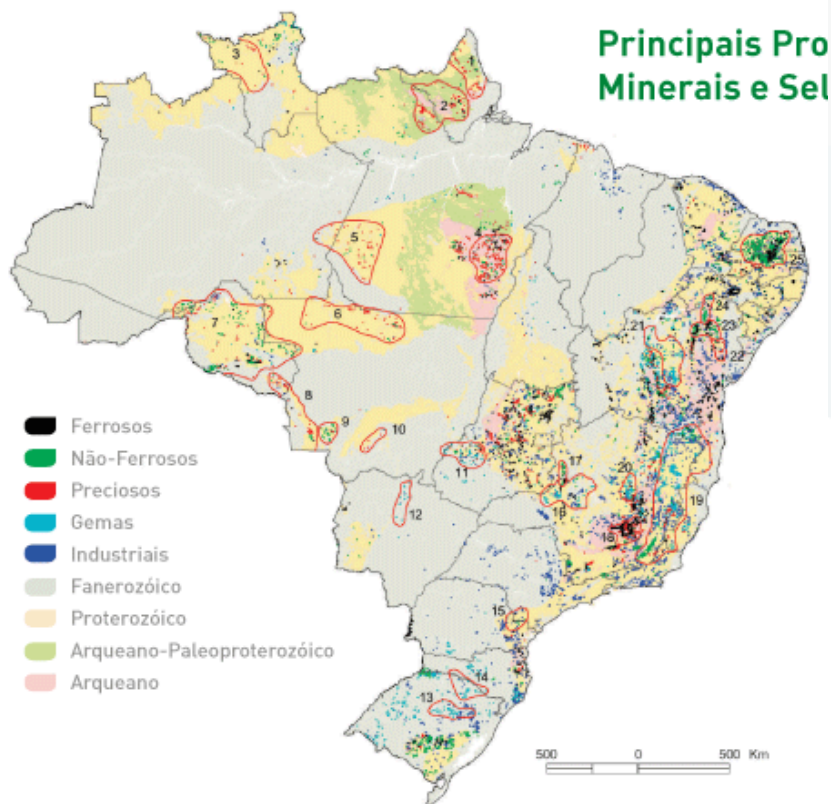
Markets with Large FO Consumption (potential for substitution by NG)



80% of Brazil Fuel Oil Consumption

Markets for Unconventional Gas

Mining (including the whole mining value chain)



Principais províncias e distritos mineraiis Fonte: CPRM



Markets for Unconventional Gas

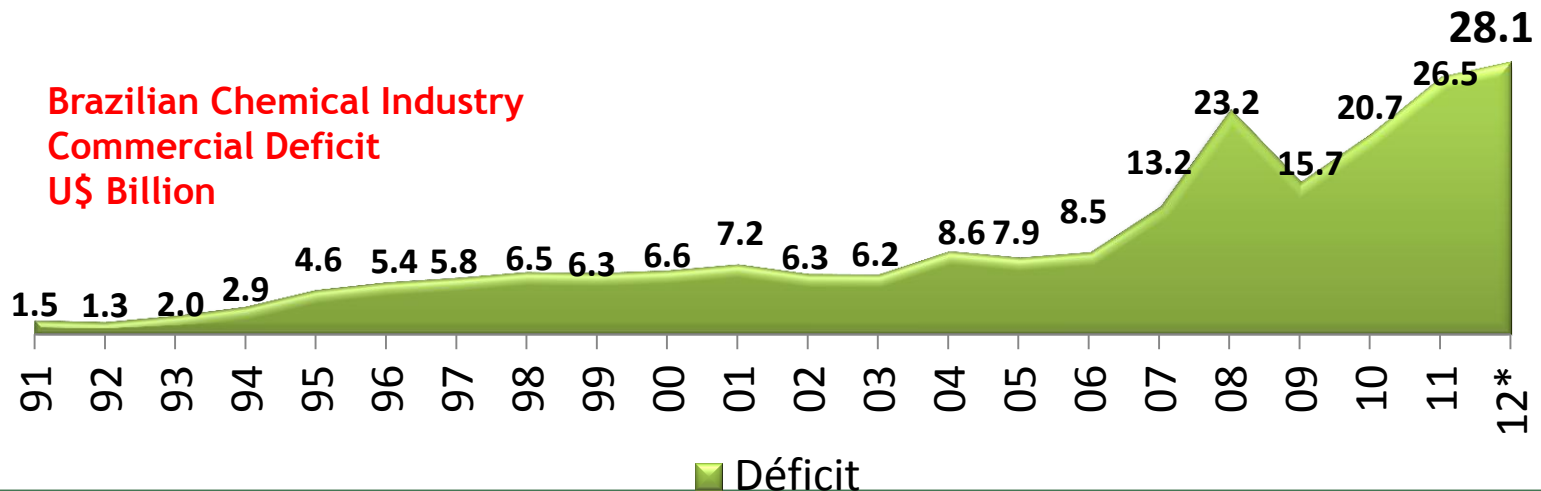
Chemical Industry (new methane-based complex)

Unconventional Gas

- Competitive price
- Secure and stable supply
- Long term contracts

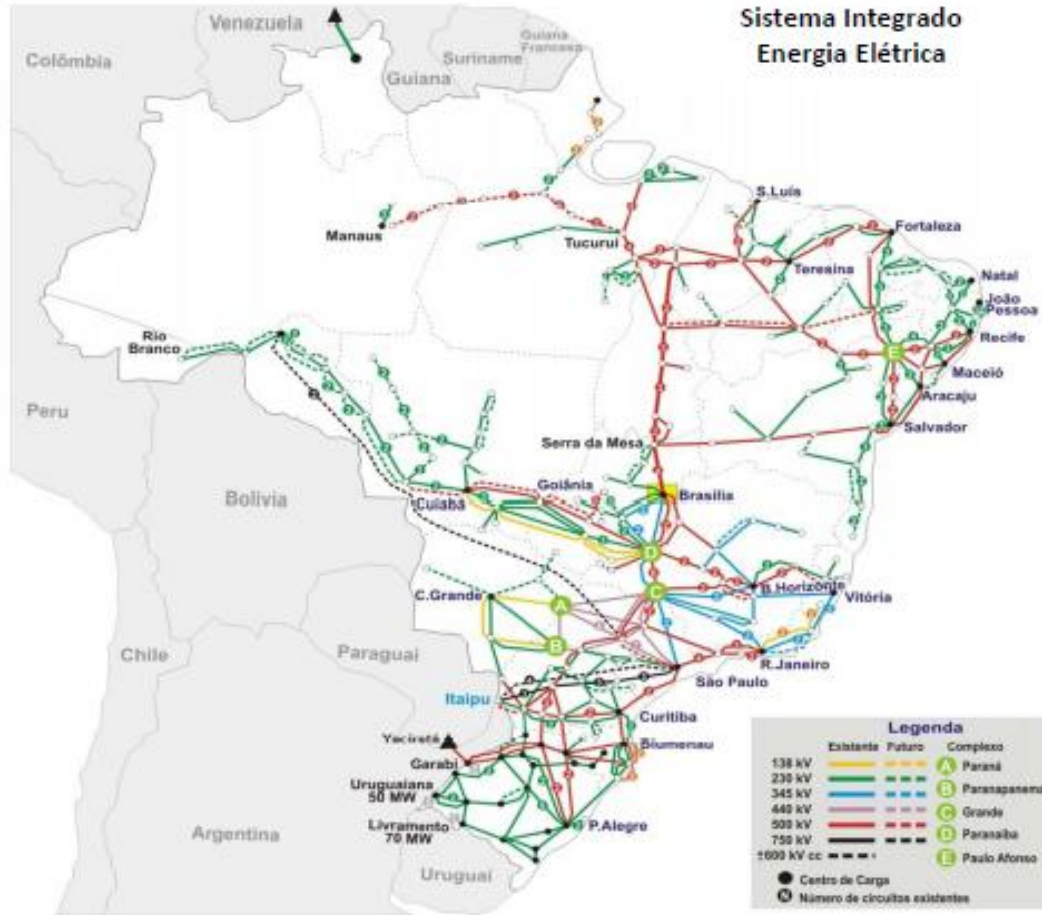


- Firm stable demand
- Value added
- NGLs opportunities
- Large domestic market for fertilizers, methanol and derivatives



Markets for Unconventional Gas

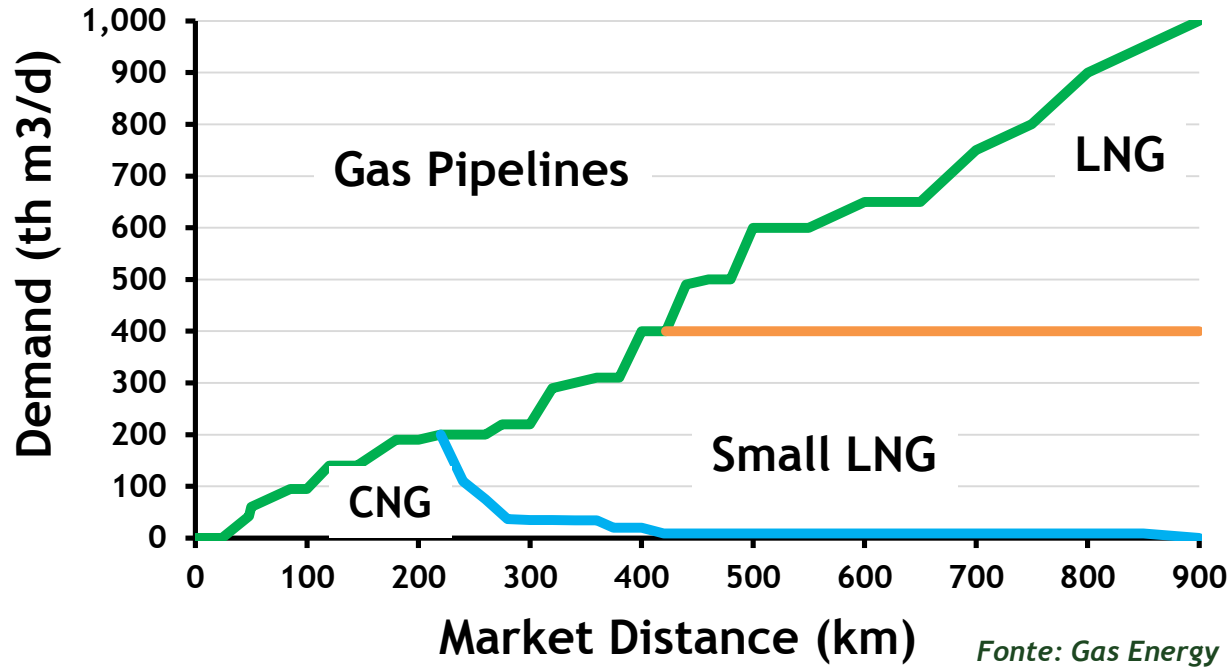
Power Generation (transmission lines available)



- The SIN (integrated national power system) is a good option to “transport” unconventional gas to markets
- Gas-fired power plants can be the anchors to develop new natural gas pipeline infrastructure
- Unconventional gas can give the competitiveness, flexibility and location needed by the SIN

Markets for Unconventional Gas

Use of Alternative Natural Gas Transportation



New Regulatory Framework to Promote Unconventional Gas Production

Exploration Access

Faster and less bureaucratic access to exploration areas

Royalties

New Royalty structure related to the fact that unconventional needs continuous investment to keep up volumes

Regulation

Specific bylaws to promote unconventional gas exploration and production

Local Content / Onshore

Incentives to develop and structure a competitive onshore supply chain

Final Remarks

How the Gas Energy Group imagines
the 2012-2020 Brazilian oil & gas
industry

Final Remarks

- New oil and gas producers (25% of NG supply in 2020) completing the first phase of the monopoly opening process that started in 2000;
- New 2013 bid rounds announced by ANP (Petroleum National Agency) for May, November and December 2013 could generate the best E&P bid results ever;
- Brazil could become the 5th world oil producer in 2020 (4.2 million barrels /day) and natural gas production expected to triplicate;
- Unconventional gas (USA , China...) puts a high competitive pressure on the Brazilian industrial sector;
- Good perspectives to develop a virtuous investment cycle in the exploration of unconventional gas;
- The 2009 natural gas law introduced new agents (among which gas traders), allowing for a more complex and competitive market;
- Brazil will need to substantially increase its gas infrastructure and for this needs to attract many new players to invest along the whole natural gas chain.

THANKS!

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