



Challenges and Opportunities of LNG in Brazilian market by the Government Program “New Gas Market”

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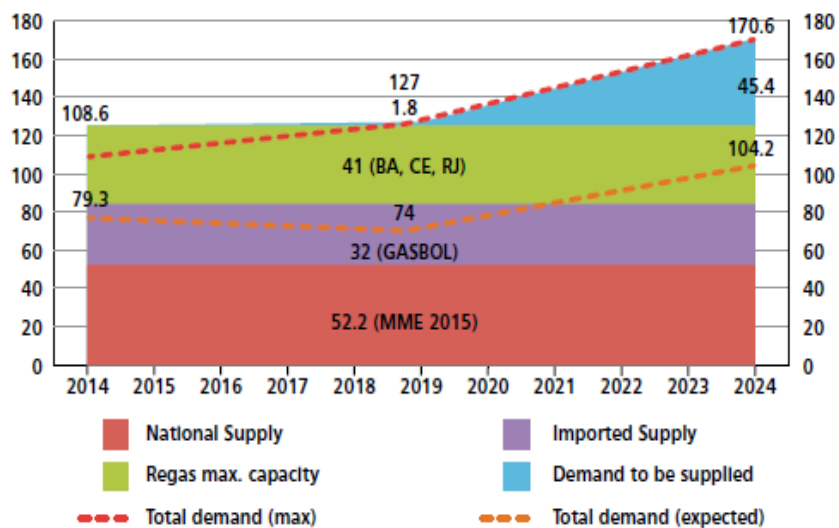
São Paulo, June 09, 2021

Objective

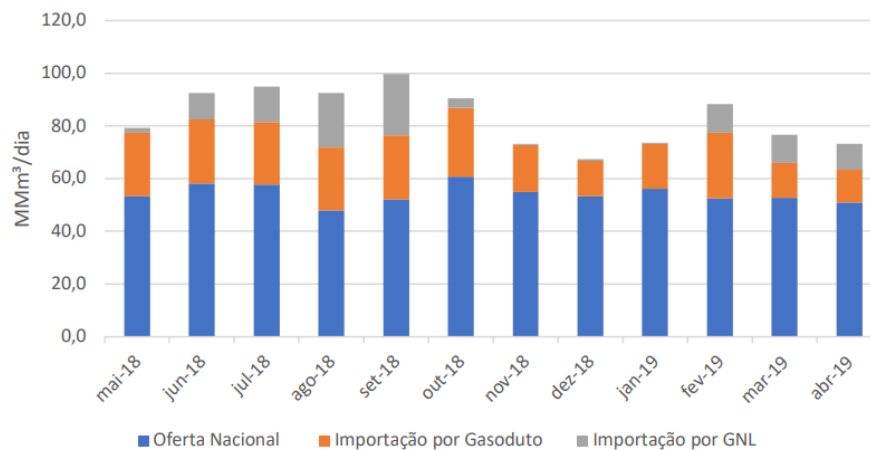
To investigate the challenges and opportunities of the "New Gas Market" program created by the Brazilian Government in 2019. The work analysis specific the LNG as a new source of Natural Gas in the Brazilian market through the two aspects:

- Feasibility,
 - Legal Conditions,
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Brazilian Natural Gas Scenario

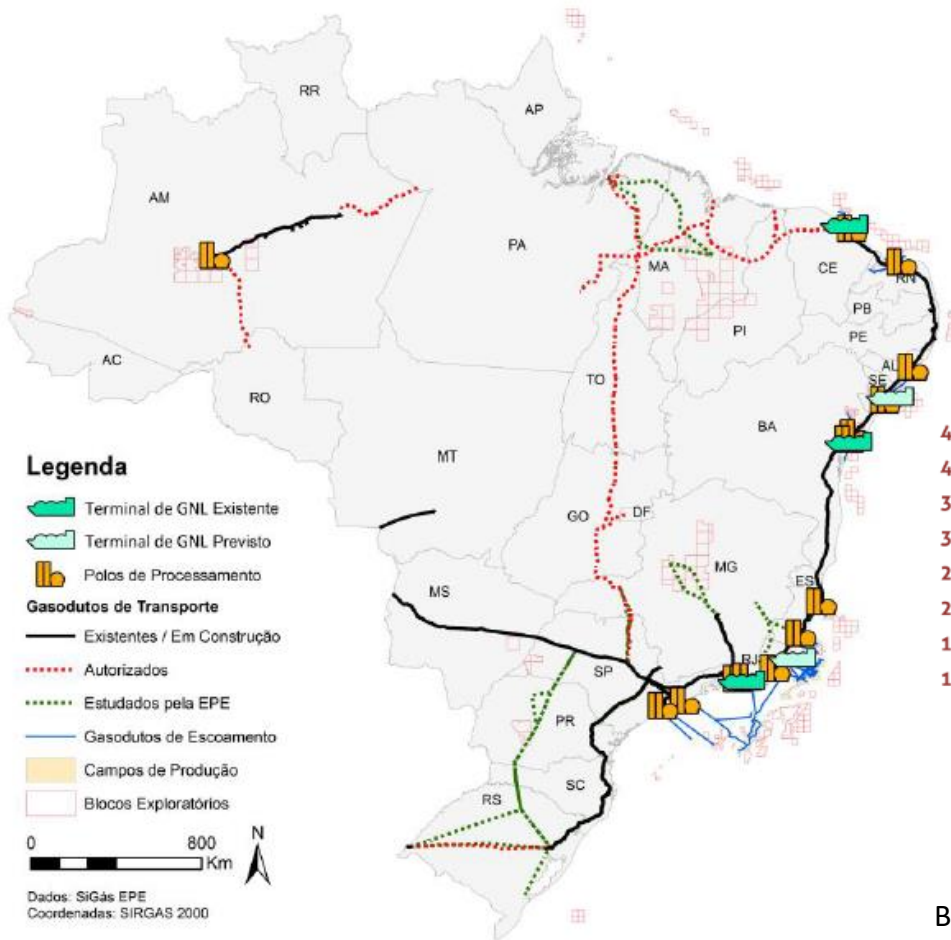


NG Brazilian Matrix.
 Source: DA SILVA, R. I. et al, 2017.

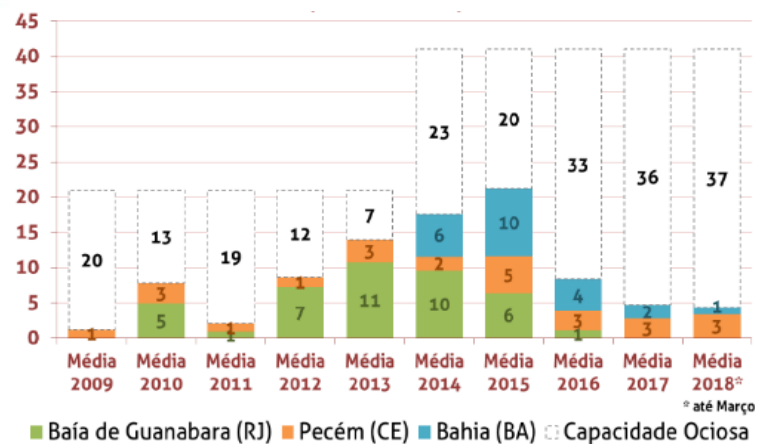
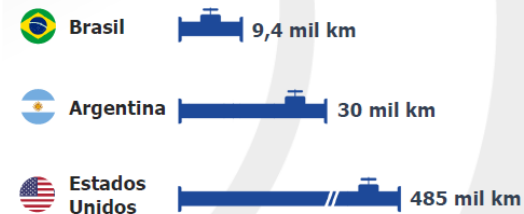


Mix of Brazilian Natural Gas (em MM³/dia).
 Source: Caderno Opinião FGV Energia, Ago/19

Brazilian Structure

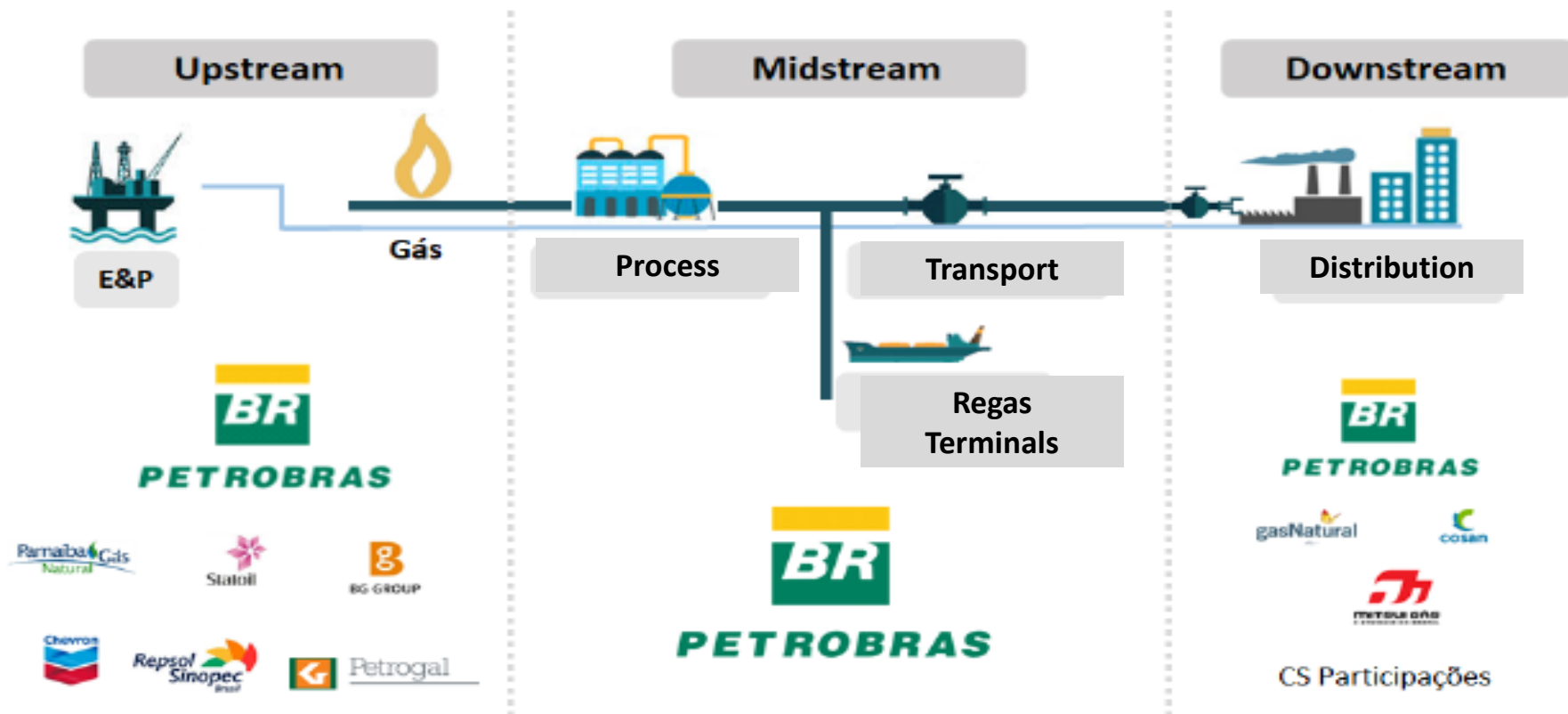


Brazilia Structure
Source: EPE, 2019.



Brazilian LNG Import capacities and otiosity (million m³/day)
Source: Secretaria de Energia do Estado de São Paulo, 2018.

Brazilian Natural Gas Chain



Brazilian GN Chain.
 Source: BRG Consulting, 2020.

New Gas Market

NOVO MERCADO DE GÁS



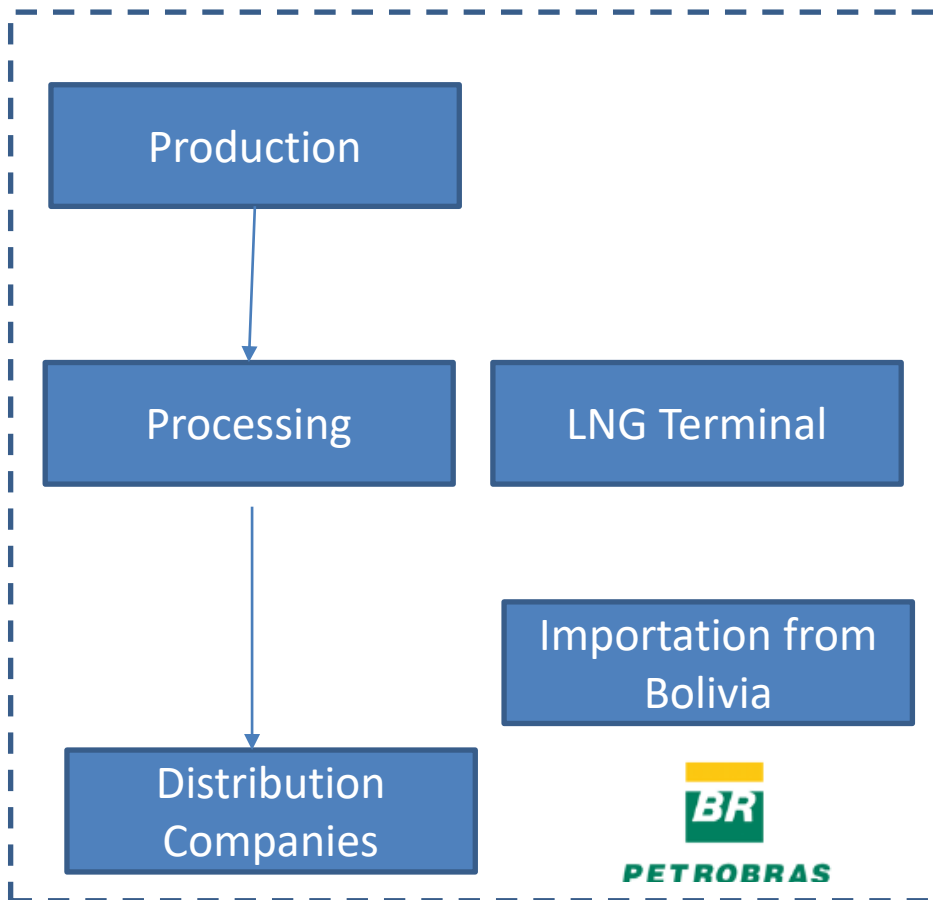
In 2019, the New Gas Market program started through the federal government's initiative.

Specific aims:

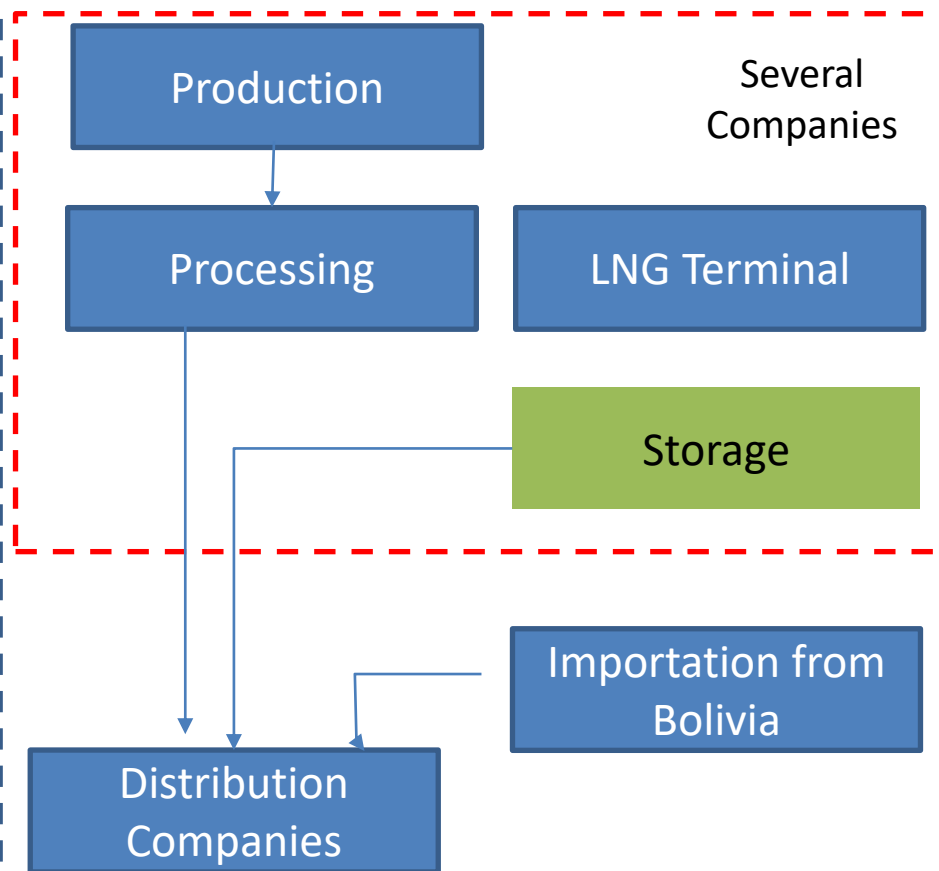
- a) To access all links in the gas chain, eliminating private monopolies in the sector;
 - b) To create an attractive scenario for investments by new players and consequent diversification of NG offer;
 - c) Integration of NG with the electrical and industrial sectors;
 - d) Harmonization of state and federal regulations.
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New Gas Market

Actual Natural Gas Market



New Natural Gas Market



What challenges will Brazil face in developing a LNG market?

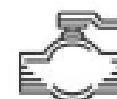
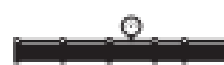
- **REGULATORY:** The new rules allow sharing and use of third party structures such as pipelines, Natural Gas Processing Units and regas terminals.
 - **TAX:** The importation using regas terminal ends up changing hands and becoming an internalized product.
 - **VOLUME:** LNG vessels have a large storage capacity for the consumption of a single company.
 - **GUARANTEES REQUIRED FOR LONG TERM CONTRACTS:** Traders require high financial guarantees as minimum volumes to make long-term contracts at attractive prices.
 - **PRICES OFFERED BY INTERNATIONAL TRADERS:** Traders know how to cost Natural Gas and other sources in Brazil and use this in their favor.
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What challenges will Brazil face in developing a LNG market?

- The operator of the gas pipeline system and networks.
 - Chamber for registration of commercialization contracts.
 - Environmental licensing for the creation of underground natural gas storage.
 - Improvements to interconnection rules.
 - Last-mile agent in the failure of the contracted supplier.
 - Standardization of contracts with distributors and access to transport structures.
 - Need for evolution and structuring of the supervisory agency.
 - Need for expansion of NG flow routes from the pre-salt and sharing between Petrobrás and other exploration companies.
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LNG Prices EUA x Brazil Netback Price

GNL USA



Storage

Transport

Regasification

City-Gate

Price of feedstock, Liquefaction and importation

Price referred to Henry Hub:
 $1,15 \times HH + 3,50$

HH = 3,105 US\$/MMBtu (Jun/21)

Price:
 7,07 US\$/MMBtu

Storage e Regás:

Storage for 10 days with 20k m³ each. Regas terminal with 10 MMm³/day
 7,06 US\$/MMBtu
 Storage: 0,39 US\$/MMBtu
 Regás: 0,18 US\$/MMBtu

Transport:

Using the case with a terminal at Guanabara bay (Rio de Janeiro) supplying a company near the terminal, without using a distribution system pipelines

1,00 US\$/MMBtu

$$\text{GNL DES Brazil} = \text{GN (hh)} \times (1 + \text{Traders}) + \text{Liquefaction} + \text{Importation} + \text{Regas} + \text{Transportation [USD/MMBtu]}$$

$$\text{GNL DES Brazil} = 3,105 \times (1,15) + 3,50 + 0,57 + 1,00$$

$$\text{GNL Brazil} = 8,57 \text{ [USD/MMBTU] (Jun/21)}$$

Conclusions

- There are favourable trade conditions for the importation of LNG from the United States to Brazil, creating the relative competitiveness of the already consolidated Natural Gas suppliers;
 - US supply LNG prices in Brazil is around USD 8.50 / MMBtu, which compared to domestic prices presents commercial viability;
 - The reference Henry Hub (HH) price is seen as a low future price, providing more attractive financial conditions for imports to Brazil;
 - The government-initiated “New Gas Market” Program will enable favourable regulations and conditions to make the LNG import operation competitive.
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Thank you!

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