BUILDING A GAS MARKET IN BRAZIL
DOES THE SPIN-OFF OF PETROBRAS’ ASSETS AND ACTIVITIES SUFFICE TO CREATE AND DEVELOP A WELL-FUNCTIONING MARKET?

The divestment process faces the risk of an incomplete reform

The challenge of creating a market is bigger than coordinating operational activities

Economical, Legal, Financing and Tax Issues cannot lag behind

PETROBRAS IS NO LONGER WILLING TO COORDINATE THE TRANSACTIONS

2015
Sale of 49% of Gaspetro*

2016
Sale of LNG Terminals and Power Plants*

2016
Sale of NTS*

2019
Petrobras will not aggregate demand

(*): Pending Transactions.
OUR APPROACH

The market we have

- Lack of a coherent regulatory model
- Absence of short-term transactions
- A highly concentrated market

Transitional Arrangements

The market we seek

- Large number of trades (buyers and sellers)
- Non-discrimination
- Proper allocation of risks
THE MARKET WE HAVE
GAS INDUSTRY TRANSACTIONS

**COMMODITY**

- **Take-or-pay contracts** ~10 years
- **Ship-or-pay contracts**

**TRANSPORT/ STORAGE/ ANCILLARY SERVICES**

- **Mid-term contracts** ~1 year
- **Capacity contracts**

**Spot Market**

- **Day ahead**
- **Short-term capacity**

**Balancing portfolios**

- **Intra day**
- **Balancing portfolios**
GAS INDUSTRY TRANSACTIONS

COMMODITY

- Take-or-pay contracts
  - ~10 years

- Ship-or-pay contracts
  - ~1 year

TRANSPORT/STORAGE/ANCILLARY SERVICES

- Mid-term contracts
- Capacity contracts
- Spot Market
  - Day ahead

- Short-term capacity
  - Intra day

- Balancing portfolios
- Balancing portfolios

TRANSACTIONS MANAGED BY PETROBRAS INTERNALLY
INCOMPLETE AND MISSING SET OF CONTRACTS

<table>
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<tr>
<th>LONG RUN</th>
<th>SHORT RUN</th>
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<tr>
<td>Commodity</td>
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<tr>
<td>Transmission</td>
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<tr>
<td>Flexibility (Balancing portfolios)</td>
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</table>
CONTRACTS TO BE SPECIFIED BY REGULATIONS

- **Take-or-pay contracts**: ~10 years
- **Ship-or-pay contracts**: ~1 year
- **Mid-term contracts**: ~1 year
- **Spot Market**: Day ahead
- **Balancing portfolios**: Intra day

**HUB PRICING**
- **Capacity Contracts**
- **Short-term capacity**
- **Balancing portfolios**
THERE IS NO PRICE REFERENCE FOR NATURAL GAS CONTRACTING IN THE POWER SECTOR

RANGE OF GAS PRICES FOR POWER GENERATION

*Sepé Tiaraju is a bifuel utility and there is no current disclosure of variable cost for natural gas.
STRUCTURE AND REGULATION OF THE WHOLESALE AND RETAIL GAS MARKETS IN BRAZIL

COMMERCIALIZATION AND TRANSPORT
SUBJECT TO FEDERAL LEGISLATION

Wholesale / Commodity Contracts
Capacity Contracts

MARKET RULES AND REGULATION TO BE DEFINED BY THE STATES(?)

SUPPLIERS
- Producers
- Importers
- Traders

BUYERS
- Self-producers*
- Self-importers*
- Free-Consumers
- Distribution Companies (Retail)

*Not specified in the text
THE MARKET WE SEEK
STANDARDIZATION OF GAS CONTRACTS

Duration and starting dates
(e.g. define day-ahead contracts)

Delivery points
(each of them will be a “pricing point”)
STANDARDIZATION OF DELIVERY POINTS – PHYSICAL HUBS

Example of physical hub
Example in which all trade is referred to a common "virtual" pricing point.
VIRTUAL VERSUS PHYSICAL HUBS

VIRTUAL HUBS

- Main advantage: Larger amount of trading possibilities
- Main drawback: Difficulty to provide investment signals

PHYSICAL HUBS

- Main advantage: Larger amount of market-based investment signals
- Main drawback: Difficulty in finding enough players
Elementary tasks to be performed

- Facilitation of trade must be implemented
- The need to choose an access regime
- Decisions to be made now

- Standardization of commodity contracts
- Standardization of transmission contracts
- Transparency of price formation
- Point-to-Point or Entry-Exit
- Access regime
- Unbundling
MENU OF ACCESS REGIMES

MARKET STRUCTURE

Regulated Access
- Entry-exit
  - Single Market
  - Regional Markets
- Implicit Capacity Allocation
  - Implicit Auctions Model

Negotiated Access
- Pipe-by-pipe Model
UNBUNDLING MODELS

Model A – OU
Supplier

TSO
- Owns the network
- Manages the network

- No control
- Only minority shareholders
- No voting rights
- No appointment of administrators

Model B – ITO
Supplier

Supervisory body
Independent management
Compliance officer

Model C – ISO
Supplier

Network owner
ISO
Network operator

TSO Network owner and operator
ACCESS TO NON-TRANSMISSION NETWORKS

Gathering systems, trunklines, processing plants, etc. need an access regime...

...but it does not need to be the same as the transmission system regime

The essential facility doctrine may help

• TPA will be granted when the facility is essential to access the market

Again, one needs to decide between regulated and negotiated TPA
CONCLUDING REMARKS
# THE ROAD AHEAD

## Make a decision on a target model

## Define how players will interact

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<th>Role of Petrobras as gas buyer</th>
<th>Distribution Companies and Regulated Tariffs: Retailing and last-resort tariffs</th>
<th>Role of PPSA</th>
<th>Facilitating Trading Possibilities (including measures to facilitate entry)</th>
<th>Gas to power</th>
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**GRUPO BANCO MUNDIAL**

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**FGV CERI**
GAS AND POWER INTERACTION

**Hydro**
- **Long Run**
- Nested coordination of opportunity costs

**Gas**
- **Mid Run**
- Gas Market with power system players’ participation (including ONS)

**Finance**
- **Short Run**
- Coordination of financial products

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Power price
TAXATION POTENTIAL ISSUES

ICMS over gas transactions
• Commodity Trade
• Transport Service
• Current legislation is linked to the physical flow (assumes that there is a physical flow)

ICMS on a Market with Diversity of Players
• Commodity Trade
• Transport Service: The definition of the contract is still pending
  • Entry-Exit: the transport service contract is different
  • The object of the contract is not one flow is potentially all the flows in the network