POLICY BRIEF

ESTABLISHING A BRAZILIAN GAS MARKET

Miguel Vazquez, Lívia Amorim and Joísa Dutra
On October 31st and November 1st, 2016, the Center for Regulation and Infrastructure from Fundação Getulio Vargas (FGV CERI) organized a two-day workshop discussion in collaboration with the World Bank and ABRACE. The event gathered regulators, government representatives, academics, operators, financial institutions and investors. The debate focused on the main challenges faced by the current restructuring process of the Brazilian gas industry. This document presents the main points discussed during the debates.
1. INTRODUCTION

The Center for Regulation and Infrastructure has been collaborating with the World Bank to discuss some topics that are essential to the future development of the Energy Sector in Brazil. One of the topics include the proposed Reform in the Natural Gas Industry. The gas industry is a key link in the energy supply chain, affecting other industries including the Power Sector. The role that gas can play influences how the power sector could evolve, determining interplays with renewables and hydropower generation with significant impacts in the context of climate change.

Regulatory framework changes in the Power Sector has sought to lower prices of electricity without considering additional complexities such as security of supply, avoidability of power deficits and bankability of projects. A well-structured industry creates the possibility for addressing security of supply concerns as well as effectively supporting the integration of renewable energy and elimination of deficits caused by severe impact of adverse droughts. These objectives can also be achieved in a cost effective price environment with further impacts to the industrial sector - note that the NG consumption in the industry is similar to the Power Sector.

The challenges faced by Petrobras has created an opportunity to revisit the organizational structure and regulatory framework of the industry. The stated goal of this process is to promote (create) a market for natural gas with the following features:

- Large number of transactions
- Large number of players on both side of the market

Since 1997 this country has been flirting with the idea of creating a market for natural gas. However, the industry requires a vision and solutions beyond engineering challenges: the industry requires a market design underpinned by a modern regulatory framework capable to respond to those new challenges.

Implementing those goals involve tradeoffs - some of them conflict with the goal of promoting a liquid market with a high volume of transactions/trades and a large number of players on both supply and demand sides. Those goals may also confirm there is an uneven understanding and contradictions of what a gas market really is. The international experience shows no gas market is perfect at the moment of inception. There are alternatives and they deserve proper assessment.

We have identified three main ideas that guide our contribution to the debate. These contribution stems from the two-day discussion on the international experience that are relevant to challenges the government, NG agents & stakeholders are about to face.

Three points should drive our attention:

1. What market and level of competition do we really want?
2. Are we prepared to embrace this new market without resorting to political interference?
3. Are we prepared to pay the price for this market to be implemented?
2. DEFINITION OF A TARGET MODEL

The aim of this brief is to analyze the process of creating a well-functioning gas market in Brazil. That is, assuming that the policy objective is to construct a gas market in Brazil, To that end, we have described strategy based on three pillars: i) characterizing the market we have; ii) identifying the market we seek; and iii) developing transitional arrangements to migrate from the current situation to the desired one.

Once these decisions are made, a target model need to be defined. The decisions required for the definition of a target model can be grouped under three broad headers:

Decision #1

Who participates in the market? – Two basic choices need to be made at this point: i) contract vs common carriage and; ii) full retail competition vs regulated distribution.

To understand the choice between common and contracts carriers, we consider that restructuring essentially consists in transforming former vertical integrated industries into market-based industries. Hence, some of the activities in the supply chain are opened up to competition. This objective drives the redesign of rules in order to avoid that the monopoly characteristics of infrastructures became an entry barrier for the resulting market. That is, the use of the same infrastructures by different players is at the core of the reform. Nonetheless, the way in which this is done varies depending on the context. Contract carriage systems are based on the idea of pipe-to-pipe competition. Differently put, competition plays a relevant role in the coordination not only of commodity-related activities but also of transmission activities. On the other hand, common carriage systems consider that networks are public goods, contrary to the view of contract carriers. The logic for this decision might be the consideration that gas network activities have the structure of a natural monopoly or a too-concentrated oligopoly and thus are the main barrier for opening up the commodity market.

Historically, distribution companies were responsible for two different kinds of services:

Commercialization of natural gas (often referred as commodity service): the service of buying and making arrangements for the delivery of natural gas at the delivery point.

Distribution of natural gas (often referred as the network service): the service of transporting the gas through the distribution network to the final consumers.

In that context, there is a wide agreement in that distribution activities (network activities) are a natural monopoly and hence regulation should assure that there is just one firm in charge of each distribution area. One can find less agreement with regard to the best way to organize commercialization activities. For instance, the US have traditionally opted for regulated distribution companies, protected from competition by regulation, which are responsible for both commercialization (commodity) and distribution (network services). On the other hand, one of the main pillars of many reforms in the EU, including the seminal reform in GB, is full retail competition.

The choice between the two solutions for retailing activities cannot be seen as isolated from the rest of the market design. In particular, the choice is related to the previous choice between contract and common carriage.
For contract carriage systems, the central element is the long-term transmission contract. Consequently, much of the success of the market is associated with the success of pipe-to-pipe competition. Therefore, having a strong counterpart for pipeline companies is extremely relevant. That is, two or three pipelines competing to serve several small retailers subject to competitive pressures might result in dominant positions for pipelines companies. On the contrary, with strong distribution companies that are protected from competition, pipelines face stronger competitive pressures. For common carriage systems, the transmission contract is significantly less important for the functioning of the market. On the other hand, the ability of shippers to find customers is a key element of the liquidity sought by common carriage systems. In that view, strong retail competition is a key measure to obtain a competitive wholesale market.

Therefore, full retail competition would be relevant if the choice was common carriers. Regulated distribution may be an interesting option if contract carriers was the choice to organize the market.

**Decision #2**

What level of unbundling? – The second group of choices is associated with the creation of coherent incentives for the market structure. One of the basic instruments to control perverse incentives in network industries is the prohibition of vertical integration of network owners and network users. This is often called unbundling. In that context, one needs to deal with: i) Unbundling at the transmission level; and ii) Unbundling at the distribution level.

Both contract and common carriers rely to some extent on unbundling at the transmission level. This comes from the fact that the main difference between the two carriage systems is whether the transmission operator is a market player or a regulated one. In any case, however, the transmission operator (whether a pipeline operator or a system operator) would have incentives to preclude access if it is vertically integrated with network users that compete in markets (frequently called shippers). Although it is recognized the need for unbundling in both types of carriage systems, the particular unbundling requirement may vary. Historically, the US opted for ownership unbundling models. This choice may be justified by the central role that pipe-to-pipe competition has in the contract carriage model, and hence the need to eliminate possible perverse incentives.

In the EU, those incentives have represented a relatively less important
Historically, unbundling requirements began by accounting unbundling and gradually evolved to more restrictive unbundling models.

Unbundling at the distribution level means the separation of these two activities. The necessary unbundling requirements vary depending on the organization chosen for the retail market. If there is no competition in the retailing activities, then unbundling will not be possible. On the contrary, if retail competition is to be implemented, then unbundling of distribution and commercialization activities is a relevant piece of the design.

**Decision #3**

What target model? – Once the previous choices are made, the details of the market design need to be defined. We represent the process to implement an entry/exit regime as made up of four steps: i) Product definition (What to contract?); ii) Contracting mechanism (How to contract?); iii) Pricing mechanism (How to price?); iv) Investment decision (How to build?). Furthermore, several measures to facilitate trading in the new market are often required, such as the standardization of contracts, the creation of new market institutions, dealing with legacy contracts and tax challenges, etc.

One of the main lessons to be drawn from the above analysis is that there is a sequence in the decision-making process associated with gas market design. For instance, it is not possible to define “transmission tariffs” (a pricing mechanism) without having defined “transmission capacity” (what is going to be priced). In turn, it is not possible to define “transmission capacity” before defining who is going to define capacity (whether to implement contract or common carriers).

*figure 1. Basic models for gas networks regulation*
3. IMPLEMENTATION OF AN ENTRY / EXIT REGIME

In the current restructuring process of the Brazilian gas industry, it has been repeatedly stated that the aim is implementing an entry/exit regime.

Figure 2. Basic market design choices implied by an entry/exit regime.

**Decision #1**

Who participates in the market? – As Figure 2 shows, entry/exit regimes build on thinking of the transmission systems as natural monopolies. Consequently, network services under entry/exit regimes are regulated activities. As the market cannot rely on competition on transmission activities (pipe-to-pipe competition), the market will require retail competition.

**Decision #2**

What level of unbundling? – As a consequence of decision #1, entry/exit regimes require unbundling of transport and shipping, and unbundling of distribution and retailing.

**Decision #3**

What target model? – As a consequence of decisions #1 and #2, the market design is based on common carriers and retail competition. In order to implement a target model, the next choice is whether the market design is based on explicit allocation of network capacity (as in the entry-exit system of the EU) or on implicit allocation (as in Victoria, Australia). Once the entry-exit system is chosen, the concrete level of flexibility granted needs to be defined. For instance, depending on the level of spatial flexibility given by the definition of balancing zones, it is possible to distinguish between regional (as in France) and single-zone (as in GB) markets. Table 1 provides a list of basic choices and their corresponding trade-offs in the implementation of an entry/exit regime.
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<tr>
<th>BASIC CHOICES</th>
<th>TRADE-OFFS</th>
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<tr>
<td><strong>What is going to be traded?</strong></td>
<td>• Larger zones mean more players trading the same good, but also more reliance on balancing actions.</td>
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<td>• Choice #1 – What is the size (area and period) of the pricing zone?</td>
<td>• Most flexibility controlled by system operators mean easier coordination of system operation decisions, but also limited liquidity in the market.</td>
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<td>• Choice #2 – Who controls the flexibility (LNG, storage, line-pack...)?</td>
<td>• A market exclusively based on long-term contracts hampers entry.</td>
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<td>• Choice #3 – What is the amount of transmission capacity traded via short-term contracts?</td>
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<td><strong>Allocation mechanisms: How to contract?</strong></td>
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<td>• Choice #4 – Market-based (e.g. auctions) or rule-based allocation?</td>
<td>• Rules to allocate capacity are typically inefficient, but they avoid potential problems in auctions with market dominance, and without scarcity.</td>
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<td>• Choice #5 – Balancing market or continuous trading?</td>
<td>• A balancing market may enhance efficiency (all bids are received before the market clearing), but trading balancing gas separately limits the amount of gas in the market (less liquidity).</td>
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<td><strong>Pricing mechanisms: How to price?</strong></td>
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<td>• Choice #6 – Pricing transmission by regulated prices or by market results?</td>
<td>• Auctions reflect market participants’ value for capacity (give efficient investment signals), but they might not be sufficient to cover for (historical) investment costs, and they may be inefficient in absence of scarcity.</td>
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<tr>
<td>• Choice #7 – Pricing imbalances by regulated prices or by market results?</td>
<td>• Market prices send signals to network users on imbalance costs, but regulated prices do not rely on efficient markets (which may not exist).</td>
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4. NEXT STEPS

The International Workshop allowed us to identify key topics that require further investigation in the ongoing restructuring process.

From the general view provided above, it becomes evident that access to transmission and distribution networks is a necessary condition for the implementation of any market model. In that context, it is of essence to tackle the definition of the product that is going to be traded - capacity. The lack of proper capacity products poses an effective barrier that impairs competition. Another central issue in entry/exit regimes is the existence of effective retail competition. In that view, regulation of distribution activities and its separation from commercialization is a cornerstone in market models. Such issues will be the pillars of CERI’s 2017 agenda for natural gas.

The timetable for CERI’s publications on NG is the following:

**MARCH 2017** Development of a competitive market in the Brazilian gas industry;
**MAY 2017** Capacity definition and allocation in the Brazilian gas market;
**AUGUST 2017** Gas market liberalization in Brazil and the role of legacy contracts;
**SEPTEMBER 2017** The role of antitrust in the Brazilian gas market liberalization;
**NOVEMBER 2017** Gas distribution and commercialization activities in Brazil.