

Market Design Challenges and its Consequences for The Development of Electricity Markets in Brazil – 10 years of the 2004 Model

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Abstract - In a previous paper Dutra and Menezes investigate the efficiency properties of auction mechanisms that were designed to allocate contracts among generators/suppliers and distribution companies in the regulated market. These bidding mechanisms were the foundation of the model launched in 2004 to rule the workings of the sector. Ten years elapsed and in this paper we investigate the performance of competitive mechanisms that have been adopted in Brazil in terms of their ability to deliver results compatible with the explicit energy policy goals underlying the current regulatory framework.

Keywords — Economic Regulation, Market Design, Electricity Markets, Reforms in Electricity Markets.

1. INTRODUCTION

Statute 10,848/04 established a new regulatory framework for the Brazilian electricity sector in 2004. The new model introduced two separate environments in which electricity is traded. In the regulated contracting environment (RCE) distribution companies must back-up the electricity required to meet the estimated demand for the five coming years through long-term contracts. In turn, large consumers are free to choose suppliers directly from generators or retailers in the free contracting environment.

The regulatory model set up for the Brazilian power sector in 2004 created alternative trading opportunities in the regulated contracting environment. On an annual basis the government holds auctions for electricity to be produced from already installed power plants (the so-called A-1 auctions) as well as transactions for long-term contracts (PPAs) for power plants that are to be built. These PPA contracts grant the bankability of new power plants.

From 2007 a new auction format was implemented to support large hydro dams in the new frontier: the Amazon-basin. In the following years the construction of new large hydro dams allowed for an increase of more than 20,000 MW of installed capacity. In order to assure system expansion and resource adequacy the market design evolved by encompassing additional competitive bidding procedures and contracts to procure intermittent renewables and reserve.

It is significant that the 2004 model makes provision for the growth of the system but does not provide further incentives for distributors to properly administer their energy portfolios, given that they are entitled to pass through energy acquisition costs to consumers. Hence, even though long term contracting has enabled system expansion, costs are almost entirely borne by consumers in the regulated environment stimulating the increase of tariffs rather than achieving the model's goal of reducing prices. There are no stimuli to an increase the FCE participation in the total electricity sales compromising contestability.

Despite all the competitive mechanisms available to trade electricity, several subsidies compound a scenario that makes it difficult to properly assess the underlying prices. Dutra, Landau and Sampaio [1] present evidence that electricity prices increased considerably above inflation in the last ten years. Such high prices motivated a reform in the legal and regulatory framework through Statute 12,783 that was enacted in 2012. The stated goal pursued was to foster competitiveness for the industry and the economy as a whole.

2. METHODOLOGY

In a previous article, Dutra and Menezes [2] assessed the auction mechanisms implemented to

allocate PPA-like contracts in the regulated market. The article highlighted two key lessons. Firstly, the analysis provided evidence of the high costs of reforms in developed countries that include competitors' fear of the inability of the government to commit not to impose price caps that would prevent recovering the amount invested. This phenomenon is related to the resource adequacy problem reported in the literature [3]. Secondly, from an auction design perspective, the article suggested a potential loss of efficiency resulting from the (lack of) information available to bidders concerning parameters such as ceiling prices and a built-in demand reduction mechanism. The insufficient information about key auction parameters creates uncertainty, distorts bids, and leads to inefficient outcomes.

Ten years elapsed since the 2004 reform was launched and, as such, it is appropriate to reassess the allocation mechanism by examining its actual performance rather than its design. This is the purpose of this paper.

The focus is on the model's ability to balance short-run and long-run potentially conflicting objectives such as ensuring security of supply, fair prices for consumers and an appropriate rate of return to attract required investments.

This evaluation is timely since the current situation in the electricity sector in Brazil is characterized by high prices and scarce use of competitive mechanisms that induce efficiency in the allocation of electric energy among distribution companies (load serving entities). Currently the government has not been able to procure all the electricity required to meet consumer needs. Distribution companies are subject to high leverage and as a consequence a critical financial situation prevails. Additionally, the market design flaws identified in this paper are becoming critical in the face of the ongoing unfavorable hydrological conditions are affecting the reliability of supply.

In the transmission segment the inability to explore efficient trading now includes BOO tenders for the system expansion. These mechanisms have been adopted since 1999. Even though this was considered a successful experience for several years, the recent experience is plagued by lack of competition and inability to attract bidders.

The assessment of the electricity auctions experience is held through the comparison between the stated policy goals of the model that

rules the sector in Brazil and the observed results from the efficiency point of view. This evaluation is firmly based on the economic literature on auctions and it considers (i) the ability to induce the investments in the system expansion in a timely manner confronting also the official planning and the resulting technology from an environmental perspective; (ii) the resulting prices and tariffs applicable to end consumers and its effects on the economy competitiveness; (iii) the ability to trade contracts sufficient to back up the load serving entities complying with the regulatory requirement.

3.EXPECTED RESULTS

~~This scenario must be confronted with the current trends in the electricity markets elsewhere with a considerably higher number of players due to a higher penetration of distributed generation. Recent discussions are driving attention to the importance of pricing resources properly in electricity markets elsewhere.~~

~~Distributed resources (that comprehend Distributed Generation, Demand Response and Energy Efficiency) must be evaluated according to all the dimensions they contribute to the system or even to society. Market mechanisms can cope with several of these dimensions. In this context, electricity trading has evolved and extended to include (along the road) Congestion Management, Transmission Rights, Ancillary Services and Demand Response.~~

~~This new electricity environment depends on innovation and flexibility not only at the technological level but in terms of market design. In this context, regulators and decision makers should provide proper incentives and a sound environment for such a change.~~

~~This may not be an issue in some places in the US or in other evolved markets even though some resistance have been already seen but it is certainly relevant in places where regulation is heavier and market mechanisms are not pervasive or plagued by poor regulatory governance such as the case in Brazil.~~

Institutions such as the World Bank have been propelled the Brazilian electricity auctions for long-term contracts. However 10 years after the launching of the 2004 model several questions remain about the ability of the current market design to deliver energy policy goals such as resource adequacy, reliability of supply coupled with fair electricity prices and rates and a reasonable return for investors.

We argue that the scarce use of competitive mechanisms and missing markets (such as the scarce ability to properly allocate and incentivize demand response) is one of the main explanations for this scenario. This scenario is also the result of lack of commitment to establish transparent pricing mechanisms and high ceilings in the electricity auctions combined with poor regulatory governance.

4. CONCLUSIONS

In the current paper we investigate the performance of competitive mechanisms that have been adopted in Brazil in terms of their ability to deliver results compatible with the explicit energy policy goals underlying the current regulatory framework.

5. REFFERENCES

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