



Latin American Spotlight - Special

Reform of the Brazilian energy sector, July 2004



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Introduction

The reform of Brazil's energy sector is of crucial importance for the country's future economic development. The energy sector is strategic from an economic point of view; its ability to function also has an influence on a country's growth potential. Mexico and Argentina (the latter is experiencing an energy crisis at present) but also Brazil itself, where electricity was rationed in 2001, are examples of how growth can be impaired by misguided energy policy. In answering the question as to how the Lula government is dealing with this sector, there are also some indications of what future policy will look like as regards other strategic sectors. For instance, this applies to the extension of roads and ports – a key factor when it comes to maintaining the country's ability to export. Finally, energy policy will also send a signal to foreign investors, and not only to enterprises engaged in the energy sector but to all businesses wanting to invest in the (customarily regulated) infrastructural sectors.

Below is a rough outline of the fundamentals of the "new energy model". The treatise is structured as follows: first of all, a historical description will be given of the development of the Brazilian electricity sector, followed by a presentation on the energy reform. Above all, the emphasis will be on providing an insight into the relatively complex structure of this sector and its new incentive mechanisms. Finally, the treatise will conclude with a critical discussion of the energy reform.

Development of the Brazilian electricity sector since the early 1990s

At the beginning of the 1990s, a crisis was imminent for the Brazilian electricity sector on account of excessive debt and a lack of capital. In response, several restructuring measures were launched.

In the mid-1990s the Brazilian government launched its RESEB project (Projeto de Reestruturação do Setor Elétrico Brasileiro) in an effort to decouple the formerly monopolized electricity sector vertically (separating producers and distributors), to privatize companies in this sector and to establish competitive structures both in the field of production and in electricity distribution. While a great deal of progress was made with the vertical decoupling, the privatization process was not completed by the Cardoso government. Up until now, some 80% of distribution companies have been privatized; however, approx. 80% of production companies remain in the hands of the state.

The transition from a monopolistic to a liberalized structure of the electricity sector involves significant costs since the number of players and the complexity of the sector are increasing, calling for the creation of new legal, economic and institutional instruments. In the process, it was evidently impossible for legal 'gray zones' and imprecisely defined regulatory requirements to be avoided. In this critical transition phase, there were drought-related bottlenecks in hydro-electric power generation (85% of Brazil's electricity is generated by hydro-electric power plants), triggering an energy crisis. The government imposed drastic measures to reduce electricity consumption, e.g. in the form of higher prices and by threatening to cut off power if certain consumption limits were exceeded. Today, Brazil has a power production capacity of 82,841 MW. This is more than Brazil's maximum power requirements in the region of approx. 53,500 MW. However, the sector's structural problems are far from having been overcome. In only several years of substantial economic growth, the sector should once again reach its capacity limits.

Objectives

In July 2003 the Lula government developed a new model with which the past structural problems of the energy sector are to be eliminated. According to the government, the idea is to establish clearer rules and more transparency on the electricity market in order to reduce the risk of the sector in terms of long-term private investments and increase its attractiveness. In addition, capacity reserves are to be boosted in order to guarantee a permanent power supply. Finally, low tariffs are to be secured for end consumers along with access to power for all. Experts estimate that annual investments amounting to at least R\$ 10 bn (approx. US\$ 3.2 bn) will be necessary in order to keep pace with the high level of growth in electricity consumption in Brazil. The reform was initiated on March 16, 2004 in terms of Acts No. 10.847 and 10.848. Act No. 10.848 lays down the new rules for electricity trading. One of the central features of the new model is the existence of two electricity markets side by side - a regulated market (ACR) and a so-called free market (ACL) which is not entirely devoid of regulations, however. Act No. 10.847 creates the legal foundations for the establishment of a new research institution (EPE), the functions of which are explained below.

The new rules do not apply to the hydro-electric power station Itaipu, which commercializes its electricity solely via Eletrobrás.

The regulated market (ACR)

The regulated market is composed of the producers and distributors as well as ANEEL, a regulating instance. The energy produced is offered at sales auctions conducted by the ANEEL and at which producers compete with one another. This is intended to secure the efficiency of the sector along with low prices. In the process, the auctions run quite counter to the usual procedure. It is not the buyer who has offered the highest price who wins; instead, the producer who offers energy at the lowest price receives the license to sell it. Specifically, the procedure is as follows: before the auction, the research institution EPE lays down a maximum price at which each producer participating is allowed to offer its electricity. This maximum price must be approved by the energy ministry. The energy volume to be bought must be calculated by the distributors prior to the auction; this volume corresponds to the total demand of all distributors (pool). Those producers who supply their energy to the pool (the winners of the auction) must enter into a bilateral agreement with each distributor, defining the terms and conditions of supply, prices and the terms of payment. Payment is made via the so-called clearing bank into which each distributor has to deposit its amount payable. Distributors are obliged to subject 100% of their electricity demand to contract in order to avoid bottlenecks in supply to the end consumers. In addition, a reserve is covered by agreement to take account of cyclical fluctuations. The extent of this reserve is calculated by the CMSE (Comitê de Monitoramento do Setor Elétrico), see below. The idea behind acquiring energy in a pool (comparable with a cooperative for the acquisition of energy) subject to bilateral agreements, however, is that on the one hand, economies of scale can be utilized by means of the pool (benefiting the aim of low prices), risks can be distributed (since these are borne by the pool) and uniform cost prices can be attained (see below); on the other, the form of the bilateral agreements of the current model do not need to be changed and can be used both on the free and on the regulated market.

There are different auctions for the various types of energy: auctions for new energy are intended to service the growth in demand for energy and boost expansion of the electricity sector. In auctions for existing energy, agreements running out are to be replaced. In auctions for strategic projects, the national planning council for the energy sector (CNPE) responsible for proposals on Brazil's energy policy buys individually approved projects. Adjustment agreements are entered into to satisfy unforeseen increases in demand. The different auctions and contractual possibilities facilitate long-term strategic planning, medium-term adjustments and the conclusion of short-term agreements. This is to enable market participants to absorb the risk of fluctuations in supply and demand and to respond accordingly. Moreover, surpluses or deficits can be transferred free of charge within the pool to contracts of other distributors, rendering production and distribution more efficient.

Auctions for new energy

The projects for new energy (energy from producers who do not have a license to produce electricity at the beginning of the auction process, and from projects forming part of the extension of existing projects) are initially studied by the research institution EPE to establish whether they are economically viable and subsequently cleared in terms of a list for the auction. In order to achieve efficiency in the auctioning process, the total energy producible by these projects must exceed the volume to be bought at the auction. The list is created according to national objectives. However, in order to take account of regional and local interests as well, suitable projects not included in the list may participate in the auction for new energy. In addition, this arrangement increases the number of participating projects, which is to expand competition and lead to more efficiency.

The auction for new energy is held in two stages. The first auction (J5) takes place five years before first delivery, and the second is held three years before first delivery. This is to take account of a possible increase in the demand for energy between J5 and J3. In selecting the periods, the crucial factor was that the construction of a new hydro-electric power plant can take up to five years before first delivery. However, the increase in demand cannot be calculated precisely five years prior to first delivery. For this reason, the volume to be bought at the auction is adjusted at point in time J3, i.e. three years before first delivery. Only projects for new energy are available for purchase at auction J3 if they have a "time to maturity" of three years at the most. At the two auctions (J5 and J3), both energy from hydro-electric and thermal power plants and alternative energies are auctioned off. The latter are more expensive in comparison with hydro-electric power but provide increased security in the sense that they are not prone to changes in climatic conditions. The EPE also calculates the ideal price-to-security ratio ahead of the auctions. In the sum total of all auctions, the ratio between the number of hydro-electric and

thermal power plants must correspond to this price-to-security ratio. Alternative energies are promoted in a specifically targeted fashion in the additional PROINFA program. The share of alternative energies is to be raised from a current 3.1% to 5.9% by the year 2006.

Auction five years before delivery (J5)

The distributors calculate the increase in demand for energy for a certain period of time. The total demand of the distributors for this period is pooled and then bought at an auction performed by the ANEEL according to the criterion of the lowest prices offered. Those producers who have won an auction receive a license to generate electricity which is linked to a guarantee of a certain purchase volume. The average value of all prices attained by the producers is the acquisition price for the distributors; the producer receives the price achieved for its energy at the auction.

Auction three years before delivery (J3)

The distributors again calculate the increase in demand for energy three years before first delivery for the period indicated above. If there is a positive difference to the volume calculated in J5, then this difference is made subject to contract (demand growth in relation to J5). The auction to buy this additional volume of demand and the signing of the agreements takes place in line with J5. Again, an average value is formed, which corresponds to the acquisition price for the distributors. The individual producers again receive the price attained at the auction for their respective energies.

Once the two auctions have been performed, an individual average acquisition price can be calculated for the distributor per unit of electricity which it has to pay for its total volume of electricity bought in J5 and J3. When reselling the electricity to the end-consumer, the distributor may pass on a reference value in the first three years from delivery to the consumer which corresponds to the average acquisition price per unit of electricity from all distributors. In order to generate a profit, therefore, the distributor has to achieve an individual, average acquisition price per unit of electricity that is below the reference value. The distributor must purchase or calculate more efficiently than the average; if so, its profit will represent the margin between these two average values. After the first three years from delivery, the distributor can pass on the acquisition price on the tariff to the end-consumer, which means that those distributors whose acquisition price was above the reference value after the auctions can also generate a profit. Accordingly, the reference value is an incentive to the distributor to enter into a contract as early as five years prior to first delivery. The long-term planning involved is to contribute toward lowering the risk of bottlenecks in supply as well as to the expansion of the sector.

The contracts for new energy are long-term agreements with a lifetime of 15-35 years. A distinction must be drawn here between agreements guaranteeing availability and those for quantities. The former are cheaper for the distributor since it bears the risks (e.g. risk of scarcity of water) itself or can pass it on to the end-consumer. In quantity agreements, the risks are also made subject to contract and are borne by the producer. These agreements are therefore more expensive. The choice of the type of agreement is already defined by the EPE prior to the auction.

Auctions for existing energy

Auctions for existing energy take place annually and are intended to replace agreements about to expire. The volume of the energy to auctioned off therefore corresponds to the volume of energy affected by the agreements running out. There are only quantity agreements that correspond to the agreements of the current model. Accordingly, the risks are borne by the producers. The lifetime of the agreements is 3-15 years; the first delivery is effected in January of the year following the auction. The prices attained at the auction are transferred to the tariffs for the end-consumers.

Strategic projects

Strategic projects are subject to national criteria and are not necessarily also important from the point of view of the electricity sector. Examples of these are projects such as the construction of a hydro-electric power plant with which a certain section of river is simultaneously rendered navigable, or a nuclear power plant, where the higher expense is taken into account in light of vital new technologies being

imported into the country. The projects are individually approved by the national planning council for the energy sector (CNPE) and auctioned off at least five years prior to first delivery. The agreements have a lifetime of 15 years.

Adjustment agreements

Adjustment agreements are intended to satisfy an increase in demand on the part of the distributors which was not foreseeable at the time of J3. The agreements can be negotiated on the regulated market one to two years prior to first delivery. Only distributors who do still have a market share not already covered by J3, i.e. who did not manage to place 100% of their demand under contract are allowed to participate. The agreements have a maximum lifetime of two years. The tariff for the end-consumer is calculated on the basis of the smaller of the purchase price and the reference value (newly calculated as a function of average prices per unit at points in time J5 and J3 and the volume acquired in the adjustment auction).

Tariffs for the end-consumer

For the end-consumer of the regulated market, there is a uniform tariff for all types of energy, irrespective of the distributor in question. It is calculated on the basis of the prices and volumes attained at the individual auctions. In the process, the respective transition tariffs (reference values) of the agreement of the various auctions are taken into account and a compensation mechanism is developed which enables all distributors to sell their electricity at this uniform tariff. However, the mechanism has not been worked out more precisely in the past. The background of this "tariff mix" of existing and new energy is the current surplus of energy reserves, which makes it possible to offer existing energies at a very low price. This situation is expected to remain stable until 2007-2008. Accordingly, the agreements for existing energy negotiated in the past, which have a lifetime amounting to fewer than five years, can run at very low tariffs. This positive situation is now to be used via the tariff mix and the compensation mechanism to make it possible for the relatively high costs of expansion of the sector to be financed. While this means a moderate price increase for the end-consumer, it also contributes to enhanced price stability since the expansion of the sector promoted by means of the tariff mix counteracts scarcity of supply (and associated price rises).

The so-called free market (ACL)

Consumers with a certain minimum demand have access to the so-called free market. They can purchase electricity directly from the producer by individually negotiated tariffs. In order to be able to purchase electricity on the free market, they have to give notice of termination to their distributors for a certain time in advance, depending on the volume of demand. If they wish to return to the regulated market, they have to give five years' advance notice of their intention to do so. The distributors on the regulated market cannot purchase electricity on the free market. They are tied to the regulated market.

Producers who offer part of their energy on the free market or who wish to use it for their own requirements must pay compensation to the regulated market. In addition, the producer concerned must initially have been selected at an auction of the regulated market; in other words, it must have offered its energy at the lowest price. The extent of the compensation is calculated by means of a formula in which the difference between the reference value and the price achieved at the auction is used.

The new institutions

Thanks to the reform, the state and/or the ministry for mining and energy (MME) are making strong gains in terms of freedom of action and control of the sector. In contrast, the tasks and functions of the autonomous regulation authority ANEEL (Agência Nacional de Energia Elétrica), which was founded in 1997, are being drastically reduced by the reform. Its functions are to be confined to mediating, regulating and monitoring the electricity system as well as to performing auctions in accordance with the stipulations of the MME, while the latter is responsible for formulating and implementing policies, for planning in the electricity sector and for awarding licenses in the regulated electricity market.

The CCEE (Câmara de Comercialização de Energia Elétrica), which reports to the MME, is responsible for the administration and

liquidation of the bilateral agreements between the producers and distributors in both markets.

In addition, the new model provides for the establishment of a monitoring committee (CMSE). Its task will be to calculate the extent of energy reserves required and to propose preventive measures at times of economic or cyclical disequilibria such as setting price signals or building up additional energy reserves.

The newly established research facility EPE performs studies which offer the MME the specialist background it needs for its planning and decision-making activities.

Debate on the reform

What has been criticized is that the model increases the risk of regulation and, therefore, also the risk to investors since the so-called key rules (17 in all) that will enter into force by promulgations, decrees and resolutions in forthcoming months and years are a certain factor of uncertainty. In addition, the centralization of decisions in the energy ministry holds the danger of a possible politicization and, therefore, instability of the rules following a change of government. The success of the model is heavily dependent on the credibility of the country's energy policy and the stability of the rules. It remains to be seen how consistent the government will act in the process.

There are numerous critics who say that the different conditions for auctions of "old" and "new" energy are creating unequal competition since the market risk of producers of new energy are being passed on to producers of existing energy. They say that this leads to instability in revenues of producers of existing energy, endangering an appropriate return for the investors in question. This criticism is only valid to a certain extent. The idea of the new model is not to create competition between new and old energy, but their co-existence and the promotion of expansion. Moreover, during the transition phase old energy always takes precedence when entering into supply agreements. The pool arrangement and separate auctions makes producers largely independent of the market, i.e. including the market risk, since each producer receives the price attained for its energy at the auction.

The situation is similar as regards the frequent criticism that the average price of new energy formed in the pool generally is lower than the marginal expansion price applicable on the free market, placing new projects on the free market at a competitive disadvantage. In principle, this is true. However, this is exactly what was intended. After all, the starting point for the new model is the free market of the predecessor model, which did not exactly secure the expansion of the sector. Accordingly, on the free market, the new model will tend to predominantly trade existing energy by means of medium- to short-term agreements. In contrast, the regulated market is especially important for new projects with long-term agreements as it enables these to be funded.

The tariff mix was reported to have diluted price signals that might have led to increased market efficiency. Moreover, critics say that price formation and the transfer rules to the final tariffs are not transparent enough. Indeed, the pricing and transfer rules for the end-consumer have not been fully worked out as yet. What is particularly important is the need to work out the compensation mechanism responsible for the equitable distribution of risks and benefits in the pool and which enables distributors to offer their energy at a uniform tariff. Price signals are set in a targeted manner by the monitoring committee CMSE.

Several critics consider changes to the current model as simply superfluous. Their argument runs that the crisis of 2001 was merely a cyclical rather than a structural crisis, and that it was possible to overcome within only a few months. So, they say, measures to improve the old model would be sufficient to stabilize the electricity sector in Brazil. The causes of the crisis are reported to have been the following, among others: the decline in the real value of electricity tariffs, the absence of clearly defined competences in order to secure the necessary volume of electricity production, the absence of incentives for new market participants to enter the sector, the difficulty of acquiring environmental licenses and the uncertainty regarding the restructuring of the sector. Critics indicated that the new model would not guarantee that these problems would be eliminated either. In addition, the argument runs that if the new model should fail to succeed, there would be the danger of a structural crisis with far more serious consequences. The uncertainty regarding the new model alone could induce private investors to withdraw, which might bring the sector into financial difficulties. This fear has been confirmed by the fact that in the current model draft, there still is too little by way of important details and that the government will probably not succeed in defining the new legal framework for the electricity sector in the short term. For instance, Tractebel Energia – Brazil's biggest private

electricity utility – has already announced plans to reduce the level of investments envisaged for this year by R\$ 1.2 bn on account of the uncertainty regarding the future of the sector.

Conclusion

The framework in which energy utilities will be engaged in future is complex. However, it would be inappropriate to describe it as hostile to the market. The electricity sector is heavily regulated in almost all countries. Brazil is no exception here. Many details of the new model remain unresolved, and numerous mechanisms will only need to deliver proof of their functionality in daily practice (i.e. in the next several years). As a result, we are not in a position to make a final assessment of the reform. Our expectations - also taking the generally market-friendly orientation of economic policy into account – is that planning security will tend to grow again in the next several years and the climate will become friendlier to investments.

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