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**CAPACITY, EFFICIENCY
AND CONTEMPORARY
REGULATORY
APPROACHES IN THE
BRAZILIAN ENERGY
SECTOR:
THE EXPERIENCES OF
ANEEL AND ANP**

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1. Introduction

The 1990s have been marked by important transitions in the form of operation of the Brazilian energy sector. As with all infrastructure sectors, the State has been responsible for investment in the energy sector, both for strategic and economic reasons. Beginning in the 1980s, the end of the model of import substitution, the fiscal crisis and the consequent incapacity of the State to support the adequate provision of essential infrastructure services generated important changes in various sectors of the Brazilian economy. Throughout the 1980s, the economy experienced what came to be called the “lost decade”, due to political impasses and the lack of social consensus on a better alternative to overcome the crisis resulting from the economic growth model.

In the 1990s, government initiatives focused on promoting a new operational model for the economy. Taking advantage of the surge in foreign capital inflows, economic policies removed barriers to foreign trade and foreign investment, and, together with a very successful price stabilisation plan, initiated the reform of the infrastructure sector in a context of international financial turbulence and in view of the permanent need to resolve structural problems such as the fiscal situation.

The reform of the Brazilian energy sector, as well as that of all sectors, includes various objectives, such as reducing the national debt, creating competitive structures whenever possible and transferring to the private sector the responsibility for investment to expand production. As a result, the need arises to create a new regulatory framework and regulatory agencies (a new institutional concept for Brazil) that will come to constitute a decentralised control by the State in these sectors.

In spite of these general orientations, the speed of the reform has varied depending on the segment, reflecting, among other things, the different strategic evaluations of the role of the electricity and oil sectors in the international context and the various interest groups that operate in each of these sectors.

This paper seeks to make a brief comparison of the characteristics of the Brazilian energy and oil sector reforms and at the same time discuss the main challenges. The paper is organised in four sections in addition to this brief introduction. The second section presents the characteristics of the regulatory agencies, an essential and landmark feature of the new model. The third section highlights the main regulatory instruments for achieving the objectives defined for the regulatory agenda. The outlook is discussed in section four. Finally, section five presents the concluding comments.

2. Regulatory Agencies for the Energy and Oil Sectors

2.1. The Importance of Regulatory Agencies

In view of the new regulatory challenges and in a context of scepticism regarding natural monopolies, privatisation and the progressive introduction of competition, the configuration of independent regulatory agencies acquires a decisive role in the success of the policies implemented to restructure the infrastructure sector.

The term “independence” is used here in its semantic meaning, which correlates to “autonomy”. The importance of these considerations is that, according to the traditional theory of the State and the classification of public entities, the only entities considered independent are those which, as set forth in the Constitution, represent the levels of government: the legislative, executive and judicial branches. In contrast to the independence of these branches, which is total, only restricted by the control exercised by one branch of government over another, the level of independence desired for regulatory agencies is limited to the technical and operational autonomy related to the exercise of its regulatory duties.¹ Thus, following the determination of the oversight, incentive and planning policies by the executive branch, and the approval of these by the legislative in accordance with the law, the regulatory agency becomes responsible for the practical implementation of the rules adopted for its specific area. The agency’s autonomy in carrying out these duties is characterised by the regulatory responsibilities related to technical matters and the discretionary power² used (also *technical*) in its decisions. Also, the agency’s regulatory agenda must be clearly defined so that effective responsibility for results can be established. Objectives cannot be excessively vague or ample, and it is essential that responsibilities be clearly outlined [Majone (1999)].

This independence is necessary because, with the increased complexity of industry and the expansion of the private

1 According to Moreira Neto (1999, p. 82), “independence originating from the normative power of regulatory agencies can be classified as a type of normative responsibility granted to the agency, referred to by the Administrative Rights doctrine as ‘delegalization’. In other words, it ‘fulfills the need of essentially technical legislation with a minimum political-administrative influence from the State’.” In fact, according to Souto (1999, p. 132), “independence is the result of political support of the nomination approved by the legislative power, the fixed-period terms of the directors and the natural flow of resources to outlays collected from regulated firms in the tax base.” Finally, according to Mannheimer (1998), “the basic premise for the existence and acceptance of a regulatory agency is its independence.” It is important to note that in Brazil’s case, regulatory agencies hold legal status as autonomous state-owned companies, and can also be characterized as independent (or autonomous) government agencies.

2 The discretionary power of government administration refers to the relative margin of freedom that the administrator has to make certain decisions in accordance with the convenience and opportunity factors of the measure. However, this flexibility in making decisions is subordinate, as are all other acts of government administration, to the principles established by law.

sector, agency's actions must be determined based on the specifics of each sector and insulated against influence from interest groups and macroeconomic implications. This generates, among other things, two important effects: a reduction in investors' risk, who are reluctant to negotiate with the government due to uncertainties inherent in relations with the State, illustrating the importance of clear and stable regulations with well-defined rules and responsibilities; and, bringing together the basic factors for the effective fulfilment of the regulatory objectives for advancing economic efficiency and social well being.

The first basic factor for autonomous decision making concerns the criteria for selecting directors, which should be based on the asymmetries of pro-producer information and the risks of the transfer of decision making power away from the agency always present in regulatory activities. This brings, as a consequence, social legitimacy to regulatory action. According to Majone (1999, p. 19), the administrative demands of regulating the public sector are better met by flexible and highly-specialised organisations that have considerable autonomy in the decision making process in which knowledge, specific experience and a positive reputation are the keys to greater efficiency.

The second basic factor is the guarantee of stability during the administrators' mandates (with removal from office only in instances provided by law), with nomination procedures submitted to the legislative branch. Protected by the risk of removal from their posts without just cause, agency directors are thus immune from possible government pressures related to the way in which policies that deal with the implementation of the general guidelines of the regulatory agenda proceed through the system. Further, the fulfilment of the regulatory agenda does not suffer any problems of continuity due to changes in administrations.

The third basic factor is the agency's financial and administrative independence – which is only possible if its revenue is made up of its own internal budget, generally originating from the granting of concessions and fees charged for the oversight of the operations of the regulated companies – which thus allows it to prepare itself with the personnel and materials needed for the effective implementation of the regulatory agenda.

The last basic factor is the effective authority of the agency's decisions in the mediation and arbitration of any possible conflicts between consumers, companies and the government in its respective sector, without running the risk of issues arising among the other branches of government, except in the cases of illegal procedures.

Further, transparency is fundamental to assure social legitimacy of the agency's independent activities. In this sense, the autonomous state-owned entity must assure, by means of

legislative frameworks and practical mechanisms, the greatest number possible of communication channels, with consumers and their representative organisations in such a way as to obtain a pluralist and balanced picture of interest groups' specific points of view. To assist in this task, the agency must make use of the practice of consultation of the public, through hearings of the public prior to the making of decisions with the publication of preliminary documents for the appreciation of those interested. A decisive aspect for the improvement of transparency and the agency's sense of responsibility is to establish mandatory requirements for the formulation by regulators of their lines of thinking that goes behind decisions and answers to all of the ideas brought forward at the hearings of the public prior to the making of the decision. Other desirable aspects of social control are to require approval by the legislative branch of annual balance sheets of the agency's operations and adoption of auditing procedures to maintain social control over the agency.

And finally, in order to maximise regulatory efficiency, co-operation is recommended among the various regulatory agencies, whether sector specific or not, to adopt procedures, approaches and similar procedural customs, especially in matters related to defending competitiveness, antitrust suits and defending consumers. To this end, it is particularly advantageous that the regulatory agency has power in its specific sector to access the information needed for investigations of any possible anti-competitive behaviour and negligence by the concession holders in providing quality service.

2.2. Regulatory Agencies in Brazil: Aneel and ANP

In Brazil, the creation of various regulatory agencies represents a watershed event in the Brazilian regulatory tradition, in view of the history of tacit regulation of companies in infrastructure, whether by the Brazilian Water and Electricity Department (Dnaee) or the Brazilian Fuel Department (DNC), which were both subordinated to the Mining and Energy Ministry. In this traditional configuration, sector-specific policies were directly subordinated to the executive branch, which sometimes resulted in attempts at achieving contradictory objectives, such as microeconomic (efficient production), macroeconomic (control of inflation and fiscal deficits) and social (universal access to services) objectives.

It is important to add that during the period in which the majority of companies in industry were state-owned, no effective form of social regulation was exercised. The reason for this is the inherent disinterest of the State in self-oversight, in view of the fact that it held a majority stake in the companies and there were no social mechanisms for the control of these companies. Examples in this light are the critical environmental problems that

appeared over the course of projects in the 1980s and the lack of mechanisms through which consumers could direct their complaints of abuses of their rights. Moreover, the Consumer Protection Code was only set into law in 1990.

Thus, the creation of agencies strengthened the appearance of new players in the sectorial decision-making arena, especially with the greater balance among the powers of each government branch.³ What in the past routinely became a series of internal bureaucratic conflicts now became externalised, with the legal process being directed to the appropriate forums, preferably in the quasi-judicial cases of the agencies. The creation of independent agencies becomes particularly important in view of the Brazilian political tradition, which, due to the weakness of nation-wide projects, creates excessive instability in response to shifts in power, with solutions constantly being needed to provide continuation to government policies. Since the support of government administrations frequently involves ad hoc alliances, the legislative branch cannot compel future legislators to make any decisions, and, similarly, an administration cannot comprise the administrations that come to follow, government policies, especially sector-specific policies, always are vulnerable and of a lower priority and, as a consequence, have low credibility.

In Brazil, the National Electricity Agency (Aneel) was created by Law 9,427 on December 26, 1996 and Law 9,478 created the National Oil Agency (ANP) on August 6, 1997.

The constitution in respect to this new form of organisation of the State is not a simple or consensual issue⁴ and continues to cause controversy, especially in the states that generally have not prepared themselves to regulate public services. Public utility sectors, as notes Pinheiro (1999, p. 172), are responsible for one-third of privatisation proceeds (US\$ 23.7 billion from the sale of 30 companies). In this light the Supreme Court (STF) made an important ruling that strengthened the independence of regulatory agencies. The STF ruled partially in favour of the unconstitutionality suit brought by Rio Grande do Sul state government related to the state laws that set forth that the appointment and removal of the members of the board must be submitted to the legislature. The STF understood that the removal from office of the board members could be carried out by the chief of the executive branch as long as it was brought forward and followed

3 Majone (1999) highlights two distinct views of democracy, the "majority" or "populist" model and the "State regulator" model. In the former, democracy is viewed as the government of the majority, with this group necessarily controlling the entire government to assure that all areas of government are controlled by the majority. The latter model, represented by the State regulator, is characterized by pluralism, the distribution of control and extensive delegation of tasks to institutions outside of the majority, such as independent organizations or commissions.

4 In the electricity sector, the approval of the bill to create Aneel was extremely controversial and changes to the text of the administration's bill by Congress avoided that the approved bill was significantly short of the strength needed for the agency to function as an independent entity [Abranches (1999)].

by administrative or judicial process, which guaranteed a truthful version of the situation and an adequate defence.⁵ The acceptance of this new form of action by the State is expected to be progressive and depend basically on the efficiency of the actions taken by the agencies currently in place. However, in a virtuous circle the likelihood of this outcome is directly related to the existence of previously discussed prerequisites.

In general, these prerequisites are included in the by-laws of Aneel and ANP (Table 1). In fact, the two agencies were established as autonomous state-owned companies and their revenues are expected basically to comprise internal funding that comes from its oversight activities, which assures them autonomous decision making and administration.

However, there are important differences between the two agencies that could come to have a significant impact on the efficiency and autonomy of the agencies' actions. The presidential veto of the clause in the law that created the ANP which set forth strict criteria for removal from office negatively impacted the stability and the transparency of regulatory agencies, leaving them vulnerable to the decision making of the executive branch and facilitating the capture of these agencies by others interest groups. The ANP also does not have an ombudsman, although the use of electronic recordings of the deliberative sessions of the agency's directors is expected.

Table 1
Principal Characteristics of Aneel and ANP

<i>Items</i>	<i>Aneel</i>	<i>ANP</i>
Autonomous decision making, finance and administration	Special autonomous state-owned company; Regulatory responsibilities of sector-specific technical issues by means of resolutions and ministerial orders; Arbitration power; Internal funding.	Special autonomous state-owned company; Regulatory responsibilities of sector-specific technical issues by means of resolutions and ministerial orders; Arbitration power; Internal funding.
Stability	Fixed-period terms; Rigid criteria for removal of directors.	Fixed-period terms.
Transparency	Nonconcurrent terms; Hearings of the public; Appointments approved by legislative branch; Rigid criteria for removal of directors; Ombudsman; Management contracts.	Nonconcurrent terms; Hearings of the public; Appointments approved by legislative branch; Electronic recordings and public deliberations.
Specialisation	Specialised technical personnel.	Specialised technical personnel.
Institutional co-operation to defend competition and consumers	State agencies; SDE. ^b	State agencies; ^a Cade. ^c

Source: Adapted from Pires (1999) and Pires and Piccinini (1999).

^aFor the distribution of piped gas.

^bEconomic Rights Secretariat (SDE), connected with the Justice Ministry.

^cEconomic Defence Council (Cade), connected with the Justice Ministry.

5 The objective of the Rio Grande do Sul state government was to remove the board members appointed by the previous administration [Gazeta Mercantil (November 19, 1999)].

Another important aspect is that, both in the case of the ANP and Aneel, no consulting councils with representatives from various interest groups with involvement in regulatory decision making were instituted, which reduces the transparency and the efficiency in the checks and balances of the agencies. Similarly, the legislation that created the two agencies provided for successive terms for directors, making the agency's board of directors more sensitive to the risks of the transfer of decision-making activities away from the agency due to the repeated negotiation and arbitration interactions with the parties involved in regulatory activities.⁶

Finally, in both agencies clear objectives were established for the regulatory agenda, and in Aneel's case there is still a management contract that specifies regulatory targets and that must be adhered by the administrative council. Two other factors deserve mention. The first is that both Aneel and ANP were given the right to carry out the tender offer of concessions. The second is that Law 9,478 of 1997 that defines the ANP's agenda sets forth that the agency must follow any rulings made by the National Energy Policy Council (CNPE), although this has not been put into practice.⁷

However, there are challenges to be overcome for the agency's regulatory agenda to be put into effect efficiently, especially those brought about by the lack of a regulatory tradition and the lack of specialised personnel not yet hired by the former state-owned companies or government organs.⁸ Other obstacles are the present problems that prevent the effective authority of Aneel's decisions in the resolution of any possible conflicts. Even though Law 8,987 of 1995 (the Concessions Law) provides for the agency's adoption of arbitration, the situation is not absent from turmoil, in view of the fact that Law 9,307 of 1996 (the Arbitration Law) applies to commercial contracts, while administrative agreements fall outside of its scope. Viewpoints on the issue are divergent and possible arbitration carried out by the agency could be transferred to the jurisdiction of the judicial branch.⁹ In practice, this possibility leads many of the agency's decisions to not have the expected immediate effects due to the inherent sluggishness of the judicial system. Finally, it would be advantageous to refine the legal system so that a possible removal from

6 For more information on Brazilian regulatory agencies, see Pires and Piccinini (1999).

7 This factor was highlighted by Leite (1999, p. 418).

8 In the initial phases of the reform of the infrastructure sector there was an ambiguous relationship between specialization of the directors and the transfer of decision-making activities away from the agency. Specialization brings credibility and a positive reputation to the regulatory agency, also helping to reduce the asymmetry of information. However, in a context of transition the majority of personnel are located in sector-specific companies or organs, which possibly contributes to the transfer of decision-making activities away from the agency or the reproduction of cultures with a greater focus on engineering (technical regulations) than the economy (economic regulation). This aspect is highlighted by Pinheiro (1999).

9 For further information on the issue, see Souto (1999). Also see Pinheiro (1999), who suggests that the same worth should be given to collective decisions by regulatory agencies and to decisions made by judges in the lower courts, so that pleas to the courts will be guided directly to the higher courts.

office of the directors by a unilateral mandate by the chief executive would also be submitted to the legislative branch with a view to creating an additional safeguard against the political use of the agency's various offices.

In addition, there was a lag time between the implementation of the reforms (covered in detail further ahead) and the creation of the agencies, which, in Aneel's case, helps to weaken, although temporarily, its legitimacy in conducting regulatory activities. In the electricity sector, the creation of Aneel was preceded by the beginning of privatisation, which yielded a series of implications for the new model, which will be addressed in the next section.

3. The New Model and Regulatory Instruments¹⁰

3.1. Promoting Entry

The institutional structure and the regulatory model adopted in the electrical and oil sectors differ significantly from each other, both with regard to the speed of implementation, and to the objectives of the reforms in question. The progressive loss on the part of the State's capacity for investing in infrastructure, with the consequent compromising of quality and the expansion and modernisation of public services led to the approval of the Law of Concessions, a regulatory standard for private sector entry to, exit from and operation within infrastructure sectors.

The guiding idea in the electricity sector was that the variables that determined the functioning of the segment would be independent of any exogenous factors, with the establishment of conditions for *full scale privatisation* and the introduction of competition on international lines. According to the prevailing view, the electrical sector offered the best opportunities for raising funds for the reduction of the public-sector deficit, as well as for introducing competition into the generation and sale segments, in the light of the variety of existing agents.

While the federal government never expressed its view of the oil sector explicitly, it regarded oil as an important commodity; the price and supply of which depended on factors beyond its control. Another important point was that the sector was verticalized in the prospecting, exploration and transport segments, due to the State monopoly enjoyed by Petrobras. For this reason, the government adopted a strategy of long-term transition to a more competitive model of *marginal privatisation*, that is, the

¹⁰ This section draws on the paper by Pires and Piccinini (1999), which provides an overview of regulation in other Brazilian infrastructure sectors.

entry of the private sector through partnerships with Petrobras, and competition for new, unexplored areas.¹¹ In addition, having understood the strategic character of the oil sector, the government realised that it was important to establish a regulatory agency in order to guarantee the adequate supply of this raw material.

In keeping with the principle of consolidating an institutional system that would make feasible both privatisation and the entry of private operators into the electrical sector, Aneel sought to establish a series of conditions that would encourage the entry into the generation and commercial segments,¹² that would regulate free access to electrical transmission lines, and that would adopt tariff mechanisms in those segments that remained natural monopolies (the case of transmission, distribution and sale of energy to captive clients), that would give consumers some of the efficiency gains achieved by concessionaires.¹³

Aneel took the bet that a competitive generation segment would be consolidated through a rapid increase in the use of natural gas as a proportion of total national energy consumption, due to the construction of gas pipelines that connected Brazil with neighbouring exporters such as Bolivia and Argentina, as well as the technological alternative of gas-fired combined cycle generation plants.¹⁴ Minimum requirements were established for the sale of electricity for the free negotiation of energy requirements between agents. In this way, generators with capacity of 50 MW or more, all retailers (distributors and sellers of electricity) with loads of 100 GWh or more, and all large consumers with demand of 10 MWh or more will be able to buy and sell energy on the recently created Wholesale Electricity Market (MAE).¹⁵

Various instruments were created in the oil and natural gas sector to regulate the entry of new agents following the relaxation of Petrobras' monopoly in the areas of exploration, development and production of oil and natural gas, oil refining, importing and exporting of oil, oil by-products and natural gas, including via pipelines.

11 Rodrigues and Giambiagi (1998) highlight the fact that the government's need for political support for ending Petrobras monopoly, as well as its concern to avoid splitting the government coalition led it to compromise on keeping the company in the public sector.

12 The sale of electricity is a new segment that is being created within the sector, composed of brokers and retailers, who buy energy from distributors or even generators, for sale to large consumers.

13 In the transmission and distribution segments, entry occurs through a tender process for the granting of concessions.

14 The legal system of incentives for entry into the generation segment is constituted by Law 9,074 of 1995, modified by Law 9,427 of 1996 and 9,648 of 1998, which established the conditions for the granting of concessions or authorizations for independent producers. Hydroelectric producers must obtain authorization for use of generating capacity greater than 1,000 kW and less than 30,000 kW. Capacities greater than 30,000 kW will be the object of tenders for concessions to use public goods. Thermoelectric generation is also subject to concession (through tenders) or authorization.

15 The MAE was created by Law 9,648 of 1998 and regulated by Decree 2,655 of 1998, and serves to intermediate all electricity purchase and sale transactions for each of the interconnected electricity systems.

Within the activities of exploration, development and production of oil and natural gas entry has become subject to the award of a concession, preceded by a tender on the basis of the largest amount offered for the concession. The first round of tenders has already occurred, representing the entry of several global players in the upstream segment of the industry. The first round of tender offer of areas for exploration, development and production of oil and gas, carried out in June 1999, raised US\$ 189 million, with successful bids by 10 foreign groups from five countries (United Kingdom, Netherlands, United States, Italy and Argentina) as well as Petrobras (see Table 2).

Table 2
Results of the Brazil Oil & Gas Round 1 Process: Bid
Statistics for Individual Companies – June 1999

<i>Companie</i>	<i>Country</i>	<i>Blocks Bid Succesfull</i>	<i>Signature Bonus (US\$ Thousand)</i>
Petrobras	Brazil	5	8,282
Agip	Italy	4	101,660
YPF	Argentina	4	19,615
Texaco	United States	3	26,188
Esso	United States	2	13,242
Shell	Netherlands	1	1,537
British Petroleum	United Kingdom	1	2,306
British Borneo	United Kingdom	1	961
Amerada Hess	United States	1	4,812
Kerr McGee	United States	1	3,208
Unocal	United States	1	7,569
Total			189,377

Source: ANP.

In the case of oil refining, importing and exporting of oil, oil by-products and natural gas, entry is taking place through the granting of authorisations by the regulator, in the expectation that this will help to increase competition in these activities. Finally, for the sale of oil by-products and LPG, entry had already been deregulated, while the regulation of entry to the distribution of natural gas is the responsibility of *individual state governments*, and it takes place through the granting of concessions.

3.2. Regulation of Competition

Aneel and ANP use very different instruments to promote competition and restrain actions that constitute an abuse of market power, since in the electrical sector the aim is to achieve the functioning of a competitive market, while in the oil sector, competition is at the margin of Petrobras' operations, with the assumption, therefore, of a highly asymmetric market. At the

same time, there is a lack of effective mechanisms for the interaction and co-ordination of regulatory efforts in both the electrical and oil sectors with regard to pricing policies, and even the regulation of access to electricity transmission lines and gas pipelines. This point is particularly important, in view of the need to expand the share of natural gas as a percentage of total energy consumption, as well as of total raw materials for electricity generation.

Within the electrical sector, regulation of competition has the aim of promoting, in a complementary way, the encouragement of competition in the generation and commercial segments, prevention of market concentration, and ultimately, respect for the special characteristics of the Brazilian hydrological system. This particular characteristic of the sector is by no means unimportant, and as will be observed later, there is no answer to the question as to how the apparently irreconcilable aims of "competition and co-ordination" will coexist.

On the one hand, the new legislation has created technical forms of regulating competition, aimed at harmonising the opening of the market with optimal dispatch within the interconnected system. In this way, the free negotiation of energy in the wholesale electricity market will be *subordinated* to operational planning, programming and dispatch by the National Operator of the Electrical System (ONS), which will also be responsible for managing all transmission assets held by generation and distribution companies.¹⁶

On the other hand, sector legislation aims to promote competition by deverticalizing the generation, transmission, distribution and commercial segments. With Law 9,648 of 1998, companies will be obliged to establish subsidiaries or separate accounting for these different areas of activity.¹⁷ In addition, the regulations stipulate the obligatory provision of free access to the transmission network for any agent within the Brazilian electrical system, in addition to large industrial consumers, providing an opportunity for new ways of selling electricity within the MAE.¹⁸

In order to restrain activities that lead to market concentration, the new legislation of the electrical sector through Aneel

16 The ONS is a corporate body that operates under private law, and is composed of representatives of the various agents within the sector, large consumers and the government, in the form of a private-sector association. The ONS began operating on March 1, 1999, and since then has progressively absorbed functions formerly attributed to the Coordinating Group for the Operation of the Interconnected System (GCOI), that was coordinated by the state-owned company, Eletrobrás.

17 The deverticalization of the integrated companies was adopted with the aim of making non-discriminatory billing possible within the distribution network, allowing consumers to see specific costs, and expanding the non-captive market. All distributors are obliged to grant passage to blocks of energy traded by agents of the MAE, charging the commissions due for the use of their lines (basic network with voltages of 69 kV or more).

18 The sale of blocks of energy through the MAE may be on a short-term (spot) or long-term basis, and will take place through the negotiation of financial contracts called Wholesale Electricity Market Contracts.

Resolution 94 of 1998 has established a series of limits on stockholding composition on cross-holdings and policies for the purchase and sale of electricity between agents.¹⁹

In addition to the complexity of making the incentives for entry compatible with technical regulation, from the point of view of competition, the adequate functioning of the new regulatory model for the electrical sector depends on the conclusion of the process of separation and subsequent privatisation of federal companies, as determined by Law 9,648 of 1998.²⁰ At the same time, considering the interest groups involved, the government has faced severe political difficulties in promoting this process, such as the solution of the settlement of employee liabilities and the separation of nuclear assets in the case of Furnas, the definition of water regulation in the case of Chesf, and the economic and financial feasibility of the isolated systems in the case of Eletronorte.

In the oil and gas sectors, with the exception of restrictions that oblige Petrobras to constitute specific subsidiaries in each of its areas of operation within the sectors, regulation of competition has not yet been subject to specific rules, with only the general guideline mentioned above, that the ANP must communicate any fact to the Cade that constitutes an infraction of economic nature. The entry of new agents into all segments of these industries following the relaxation of Petrobras' monopoly, requires the rapid adoption of rules that discipline cross-holdings and free access to transport segments, most notably in the case of natural gas. In this case, the presence of a single group of investors in the exploration, transport and distribution segments could result in the concentration of this market, with the consequent risk of abuse by the dominant power, and the occurrence of practices that discriminate against other agents.²¹ We should also mention the importance of co-ordination between the ANP and the regulatory agencies at the individual state level, with regard to actions

19 According to this resolution, it is prohibited for market agents: a) to hold more than 20% of the national installed capacity, or 25% and 35% of the existing capacity of the South/Southeast/Centre-West and the North/Northeast interconnected systems, respectively; b) to hold more than 20% of the national distribution market, or 25% and 35% of the distribution market of the South/Southeast/Centre-West and the North/Northeast interconnected systems, respectively; and c) to own cross-holdings in generation and distribution companies amounting to more than 30%, taking the arithmetic sum of the shares in the two markets. In addition, a distribution company may only acquire energy produced by itself up to the limit of 30% of its demand.

20 The original idea is to reduce the market power of the existing generators with the creation, primarily, of the following companies: three from Furnas (two generators and one transmission company), four from Chesf (three generators and one transmission company) and six from Eletronorte (two isolated generators, one generator that supplies the interconnected system, including the Tucuruí hydro-electric plant, one transmission company for the interconnected system, and two integrated companies that supply the isolated systems).

21 While the participation of the private sector is a recent phenomenon in the natural gas sector, it is already possible to verify trends towards vertical integration and market concentration. British Gas and Shell, for example, which are joint owners of the Bolivia-Brazil pipeline, are stockholders of Comgás, the largest distributor of natural gas in the country. In the same way, other stockholders in the pipeline, Enron and Petrobras, already hold equity stakes in several natural gas distributors in the states of the Northeast.

that prevent market concentration. These measures may be taken to discipline the acquisition of assets by natural gas distributors that are involved in decentralised privatisation programs by individual states.

3.3. Definition of Tariffs

The definition of tariffs in the downstream segments of the electrical and natural gas sectors is one of the most sensitive aspects of the restructuring and privatisation processes within the Brazilian energy sector. It is in this area that the fragility of the regulatory models is most accentuated, because they did not follow the optimal sequence of regulatory reforms, which should be the strengthening of the new regulatory agencies before privatisation.²² In the electrical sector, as mentioned above, the beginning of privatisation process preceded even the creation of Aneel, with the first three concession contracts signed by the former Dnaee, an agency subordinated to the Ministry of Mines and Energy.²³

For the sectors that have remained natural monopolies, distribution and transmission tariffs are being regulated according to the criteria of price cap and revenue cap, respectively.²⁴ With regard to transmission tariffs, new investments in transmission lines will be remunerated on the basis of benchmark prices for the use of the basic network, that is, lines with voltages of 230 kV or more, as well as connection costs, taking into account the characteristics of the geoelectric zones where generators and consumers are connected.²⁵ The definition of tariffs for the transport segment entailed a major dispute within the sector, particularly with regard to the definition of the "basic network" subject to management by the ONS, since the classification of assets potentially affected the sharing of revenues between transmission and distribution companies.

The amounts of the initial tariffs for electricity distribution to captive clients are being defined in the new concession contracts. The need, on the one hand, to start privatising in the face

22 This optimal sequence is suggested in Pinheiro (1999, p. 171), but has not been observed in the restructuring of any infrastructure sector in Latin America, where the last stage of the sequence preceded the first two for reasons of fiscal nature.

23 Escelsa was privatized only four months after the approval of the Concessions Law, and is the only contract that does not introduce a price cap regime.

24 The price cap regime adopted internationally consists of the establishment by the regulator of a price ceiling either for the average price or for each product of the company, corrected according to the change in the consumer price index, less a percentage corresponding to a productivity factor for a predetermined number of years. For a revenue cap, the initial permitted revenue is adjusted by the change in inflation less an efficiency factor, in order to encourage productivity gains.

25 On the one hand, this measure aims to give greater transparency to electricity transport tariffs in order to avoid discriminatory billing: i.e. the charging of differentiated tariffs to different agents for transport via the same network. This measure aims to ensure that the operation of the grid is neutral with regard to anti-competitive practices among network owners. On the other hand, it is hoped that the revenues allowed to the operators will be sufficient to reward their investment.

of inertia arising from strong opposition to the transfer of electrical assets and, on the other, the urgent requirement for funds to reduce the public-sector deficit, led the government to choose this course. In attempting to attract the private sector given this lack of regulatory definition, a "vicious circle" was created, in which there would only be an incentive to entry if contracts reduced the regulatory risks to the investor as much as possible, which would in turn entail that the checks and balances between the various parties would be unfavourable for the consumer.²⁶

In the oil and gas sector, Law 9,478 of 1997 established a limit of three years (until August 2000) for the deregulation of prices of all basic oil and natural gas by-products charged by refineries and processing units. In a clear move to reduce the autonomy of the ANP during this transition period, the Finance Ministry and the Mining and Energy Ministry are continuing to set adjustments and revisions to the prices of these products on a joint basis. Tariff policy is one of the Gordian knots of the reform of the Brazilian oil sector, and historically, the price structure of fuels has been used as an "umbrella" to meet widely varying interests of social groups and areas of the government.²⁷ It may be said that there are so many interests at stake, that the privatisation of Petrobras is unlikely to take place in the medium term.

Generally, natural gas supply prices are set by state governments, which as mentioned above, have stockholding control of most of the concessionaires, often in partnership with the private sector. This can nevertheless lead to the setting of prices on the basis of political factors, in addition to their eventual subordination to the interests of the private partners. It should also be mentioned that in the recent privatisation of three companies, CEG (Rio de Janeiro), Riogás (Rio de Janeiro) and Comgás (São Paulo), the concessionaires were obliged to adopt predetermined price ceilings.

3.4. Monitoring of Concession Contracts

Within the electrical sector, concession contracts are not standardised, even if there are general procedures established by various state governments in harmony with Aneel. These contracts also include fines and penalties for failure to meet standards of service. This is another case of Aneel suffering as a result of its difficulty in affirming itself within the new institutional model. In addition to the poor state of repair of the distribution lines due to the lack of investment while the system was managed

26 Examples of this are the fact that the contracts for Light and Cerj provided respectively for a first tariff revision after eight and seven years, as well as the fact that all concession contracts signed by the 16 privatized distributors (62% of the domestic market) stipulated a tariff reduction factor of zero.

27 For an analysis of tariff policy in the fuel and oil sectors within Brazil, see Dutra and Cecchi (1999).

by the public sector, concessionaires implemented indiscriminate outsourcing and redundancy policies in an attempt to reap extraordinary profits within a tariff regime that provided incentives for gains in the efficiency of production. This led to blackouts and a deterioration in technical and management quality [Abranches (1999)]. The agency responded in a dubious manner, initially making greater efforts to defend the privatisation process itself (as an agent of the government) did than consumers in general (as a regulatory agency). Aneel has subsequently tried to achieve social legitimacy by strengthening channels of communication with consumer protection agencies, and attempting to develop more systematic mechanisms for monitoring service quality.

In the oil and gas sectors, the emphasis within the upstream segment is on investment plans and company operations. Contracts for exploration and oil production must establish lengths of concession, as well as plans and projects for the development of production. Concessionaires must undertake to conduct their activities in a transparent manner, as well as to adopt technical standards for rationalising production and controlling the decline in their reserves. For oil refining and natural gas processing in general, the ANP has established technical requirements for modernisation and capacity expansion through authorisations that are intended to increase production and hence reduce the subsidies that such concessions currently receive. In such cases, the adoption of a complementary competition yardstick mechanism can make an important contribution to reducing the asymmetry of information enjoyed by the company, most notably by increasing the efficiency of regulation in promoting the modernisation of industrial plants. For the downstream segment of the industry, and in the specific case of oil by-products, the emphasis is on control of the quality of fuels. In the case of natural gas distribution, concession contracts signed by state governments that privatised their companies (Rio de Janeiro and São Paulo), establish norms for expanding service coverage, standards of quality for services provided, and the possibility of imposing fines and penalties on concessionaires that fail to meet the obligations laid down in their contracts.

4. Outlook

The reforms of the electricity, oil and natural gas sectors face different challenges in the pursuit of their respective objectives. The structural difficulty of the model for the electricity sector is the conciliation of competition with co-ordination. As a result of the lack of definition of the rules for transmission tariffs, subordination to the operational planning of the ONS and, especially, uncertainties as to the future level of generation costs, has

led the private sector to limit its entry in the sector, with no concrete investment plans in new generation units.

In view of the signal sent by the Ten-Year Development Plan 1999/2008, of the Co-ordination and Sectorial Planning Group (GCPS), concerning the risk of supply deficits between 1999 and 2001 in excess of the limit considered acceptable (5%) for the Brazilian electricity system (see Table 3), the Mining and Energy Ministry, the Aneel and the BNDES have adopted a set of emergency measures to increase the electricity supply in the short term.

Among the other important measures, Aneel expects to mitigate the risks of energy deficits and the negative effects of the aspects related to the expectations of new investors in response to the announcement of regulatory amounts of electricity generation. These will come to serve as a parameter for "new energy" transactions in the MAE and, among other things, will allow investors in the generation segment to better project their revenue²⁸ [MME (1999)].

With the objective of helping to successfully get through the critical energy supply periods in 1999/2001, the BNDES created the Program to Finance Priority Investments in the Electricity Investments, which is applicable to generation projects identified as a priority by the Mining and Energy Ministry.²⁹

Table 3
Risks of Electricity Deficits in the Brazilian Electricity System – 1999/2008

<i>Year</i>	<i>South</i>	<i>Southeast/ Centre-West</i>	<i>North</i>	<i>Northeast</i>
1999	5.8	5.4	1.4	2.4
2000	9.9	9.8	4.7	5.1
2001	4.0	6.4	4.0	4.7
2002	2.1	3.0	3.0	2.9
2003	0.9	1.5	2.0	2.0
2004	1.1	1.6	2.1	2.0
2005	1.2	1.8	2.3	2.6
2006	0.7	1.5	2.1	3.2
2007	0.8	1.1	2.1	2.9
2008	0.9	1.6	2.6	4.1

Source: *Ten-Year Development Plan 1999/2008 – GCPS [see BNDES (1999)]*.

Note: Numbers in bold show years in which there is a risk of a deficit greater than 5%.

28 Among the additional measures that are being analyzed by Aneel, the most important are the changes to clauses of Resolution 233 of 1999 so as to introduce flexibility to the percentage weightings of the regulatory amounts for gas-fired thermal electric generation (with a view to absorbing variations in the currency and in fuel prices) and the automatic transfer of variations in generation costs to supply tariffs [MME (1999)].

29 The priority projects total 23 thermal electric plants that will add 7.5 GW to the installed capacity by 2003. For a detailed list of the priority projects and the financial conditions of this specific BNDES program, see BNDES (1999).

Complementarily, the Mining and Energy Ministry has authorised Eletrobrás to operate as an energy seller, entering into advance purchase contracts of energy with investors in thermal generation – called Power Purchase Agreements (PPA) – so as to reduce existing uncertainties regarding the return of new private-sector projects in gas- or oil-fired thermal electric plants. This also will have the effect of making financing for the construction of these projects easier to obtain. In addition, the average price of natural gas used in thermal electric generation fell to US\$ 2.26/MMBTU, with a view to making the price of this input more compatible with the regulatory amounts established by Aneel.

This set of measures shows a change in the path adopted for the electricity sector. In the previous situation, the government bet on full privatisation accompanied by a gradual opening to competition (beginning in 2003, 25% of the total of initial contracts and 100% of all new generation will be freely bought and sold on the MAE). Without interrupting its privatisation strategy – in spite of serious problems with implementation – the government opted to retreat from its strategy of opening the market.

It is important to note that one of the bets was on the end of centralised planning, which would take on the role of serving as a guideline, but the government and also assumed a strategy of “heavy intervention” in the short term, expecting with this set of measures to successfully navigate the period of critical supply in the electricity sector (until 2001). As a result, in the short term the competition on the spot market would be marginal, since with the solutions adopted the contracts would already include the established prices. Large consumers would inevitably pressure for better supply conditions, although the trend would be to negotiate long-term bilateral contracts to reduce the risks caused by price volatility. The big surprise was the Russian crisis, its impacts on the expectations of economic agents and the subsequent effect on the exchange rate, which negatively impacted natural gas imports and the possibility of new generation investments that utilised this input.

The objective in the oil sector is to attract the private sector, especially in exploration and production, in view of the significant attractiveness of the project portfolio in the areas not explored by Petrobras due to the state-owned company's restrictions on increasing investments. The sector's major problem is the definition of price structures, its impacts on the entire production chain and its repercussions on the electricity sector, in which Petrobras is expected to operate as a non-utility producer with the construction of some 400 MW of gas-fired thermal electric plants.

5. Final Considerations

The reforms of the energy sector in Brazil introduced independent regulatory agencies (Aneel and ANP) that represent an important innovation in the organisation of the State. For a country with Brazil's political tradition, these autonomous state-owned companies can help in overcoming the problems of implementing rules for the sector, bringing gains for the Brazilian people with greater transparency in the carrying out of the regulatory agenda.

However, Aneel and ANP will encounter a series of difficulties and challenges before they may effectively become independent agencies, in view of the timing of their creation in relation to the beginning of the reform and/or privatisation processes. In the electricity sector, the government's bet was on full privatisation together with the gradual introduction of competition. The absence of adequate rules for stimulating the entry of the private sector led the expected investments to not materialise at the necessary rate and the government was forced to adopt a series of mechanisms to remove the risks of energy deficits from the system. Even though the regulatory apparatus for defending competition is well defined, the emphasis on technical regulation and the need to attract investors places two huge challenges on the path to Aneel's consolidation. The first challenge is to be able to signal that they are moving towards a more competitive environment (which also includes smaller consumers) and the second is to allow captive consumers to benefit from the gains in production efficiency obtained by the companies.

From the ANP's point of view, its activities are also subject to significant challenges. First, since the emphasis of the reforms in the oil sector was neither privatisation nor the introduction of significant competition, the necessary attention was not given to mechanisms to defend competition. In view of the success in attracting private-sector capital for upstream investments and investments in the strengthening of Petrobras itself to be able to form partnerships in the domestic and international market, the oil and gas sectors' interface with the electricity sector makes, it necessary the speedy definition of controls on market share and the regulation of free access to gas and oil pipelines. Otherwise, there is a risk of consolidating some positions and creating irreversible damage that will be difficult to overcome, especially because of the size of the new players in the industry. Secondly, it is essential that the ANP attains autonomy for setting tariff policies and that the agency's regulations be improved, especially in terms of stability.

In summary, the consolidation of the modernisation of the Brazilian State, in particular the strengthening of its role as regulator, is directly related to the success of the sector-specific

reforms in progress. The capacity of the agencies to efficiently exercise their respective regulatory agendas is crucial to their legitimacy and the society may identify with the need of deliberate construction of a competitive environment in the infrastructure sectors with no loss of the benefits accrued from co-ordination. This option shows that, on the one hand, one should not hope for the illusion of automatic benefits from competition, and, on the other hand, one should not become paralysed in view of the risk of losses in the co-ordination of the system.

It is essential that consumer representation channels are strengthened, both in monitoring and demanding their rights from service providers, and in the oversight and social control of regulatory agencies to assure the faithful accomplishment of the regulatory agenda. Only a society truly informed and active in the practice of obtaining their rights as citizens will be prepared to push regulatory action in the direction of services that create positive externalities for economic development.

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