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Restructuring the Brazilian Electrical Sector

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CONTENTS

1. INTRODUCTION

The dictatorial period in Brazil, especially during the seventies, witnessed a period of growth that became known as the "Brazilian miracle", the effects of which, either positive or negative, are still felt

by Brazilian society.

No one can deny the contribution of the state in shaping the basic infra-structure and in the industrialization of the country. The industrial park, the transportation system, and the electric and telecommunication systems grew on a large scale. On the other hand, the social programs, such as health and education, did not follow the same path.

The strong influence of the state in the great majority of economic sectors was responsible for the meaningful growth of the Brazilian economy. This position of the state as an entrepreneur had, as a consequence, the predominance of economic programs to the detriment of social programs.

The state, too insensitive to perceive the exhaustion of the model began increasingly to deplete its enterprises. Because the state never defined the timing of change in its role, we came to a scenario of scarce public investment funds and of great demands by society.

Besides, the high inflation and the fiscal disorder determined the increase of the public debt, preventing the government from meeting the demands of the fast growing population . The need to control inflation became the ultimate goal, since instability corroded public finances and hindered the state from fullfilling its true function, as an agent for national development and for the welfare of its citizens.

The Brazilian electric sector has also suffered the influence of this context. The institutional model has became outdated and the electric system has been showing the need of structural changes. In spite of the great growth of the generator park of electric power, the menace of blackout is always present in the minds of those connected with the electric sector and those who greatly depend on it.

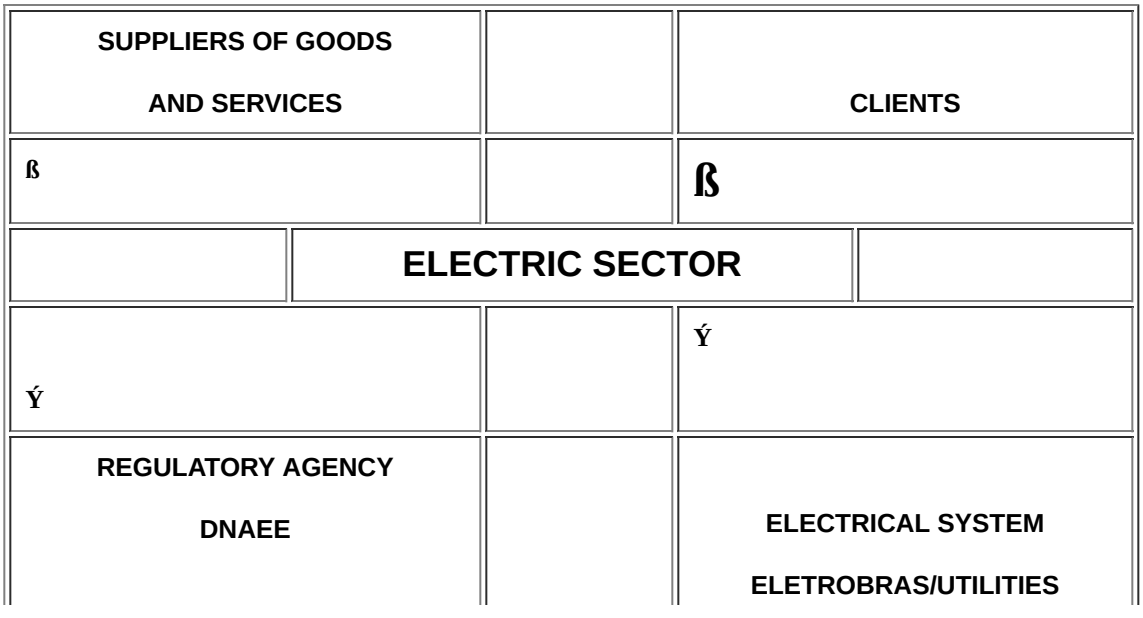
The problem leads one to re-analyze the role of the state, which must stop being an entrepreneur.

This monograph analyzes the Brazilian electric sector, its evolution under state predominance, the opening to private capital, the new regulating agent, and the sector’s tendencies.

2. THE EVOLUTION OF THE ELECTRIC SECTOR

It is essential that one understand the electric sector and its transformation throughout the years, in order to evaluate its perspectives.

The sector is made up of the electrical system, its suppliers of goods and services, the regulatory agency, and the consumers of electricity.



Legislation		**Expansion Planning**
Control over utilities		**Interlinked Operation**
Tariffs		**Financial Resources**

Picture 1. The Brazilian Electric Sector

In this monograph, analyzing the role of the State, we give great emphasis to the components directly connected to the State: 1) the regulatory agency, that is responsible for the definition of regulations related to the production and commercialization of electricity; and 2) the electrical system, that generates, transmits and distributes electric power.

2.1 The Regulatory Agency

During the First Republic (1889 - 1930), the Brazilian State functioned solely as an intervening agent in the national economy. The state's role in energy production was limited to a few isolated measures to control the sector. In 1904, for the first time, the federal budget included resources for energy production. In that year, decree No. 5.407 established certain conditions for the concession of the use of hydroelectric power. Such a decree had as its main characteristic the concession without exclusive rights; the periodical review of the tariffs every five years; a maximum term of 90 years; and the return to the Union, without indemnity, of the assets used by the concessionaire.

The increasing use of hydroelectric power led to a judicial analysis of the rules of property and of the use of water and hydraulic power. Initial legislation that formed the basis for the Code of the Waters of the Republic was presented to Congress in 1907. The characterization of public and private waters predominated in this initial draft. There was no mention as to the regulation of services. The draft of the Code did not fulfill its aim and it was discarded by the House of Representatives at the time of the Constitutional Reform of 1926.

In 1930, Getulio Vargas, taking office as the head of a provisional government, set forth an institutional reform to concentrate the political and administrative the power of the State, including over the energy sector. The first step to reorganize the sector took place in 1931 when all the acts of alienation, oneration, promise or transference of any perennial watercourse or waterfall were suspended. The federal government became responsible for the concession of electric power. On July 10, 1934, the Water Code was promulgated as Decree No. 26,234 that, even today, is the basic legal instrument that regulates the water and power sector.

This Code determined the policy of authorization and concession for hydroelectric use. The industrial use of water and hydraulic energy, even if located on private property, requered a concession signed by the President when intended for public services, and on an authorization of the Ministry of Agriculture when limited to 150 kW and for the exclusive use of the petitioner. The Code established a time limit of 30 years for the concessions and mandated that they be granted only to Brazilians or to companies organized in Brazil, except for those foreign enterprises already operating in the country.

The Code also granted the public sector the possibility of controlling the concessionaires of electric power by means of technical, financial and accounting surveillance of the companies.

The Code, because it dealt only with water issues, did not take into account the thermoelectric industry.

The military coup of 1937, which established the *Estado Novo* (The New State), an authoritarian political regimen legalized by a new constitution, impacted the energy sector basically by organizing

the activities of private concessionaires who were subjected to the guidelines established by the Water Code.

In November 1938, Law Decree no. 852 was promulgated adjusting the Water Code to the aims of the new constitution. This decree regulated the installation of transmission lines and networks of power distribution, extended the deadline for the review of contracts, and eased the nationalistic restrictions of the new constitution by allowing foreigners in the power generating companies, to buy non-voting shares.

In an administrative reform carried out in 1939, the National Council of Waters and Electric Power was created - the CNAEE - and as a consequence the energy issue was directly subordinated to the presidency. Among its several tasks, the CNAEE was made responsible for the maintenance of statistics, for the elaboration of plans that would enable the interlinking of plants and electric systems, for the regulation of the Water Code, for the analysis of tariffs related to electric power, and for performing the solutions of differences between the public administration and concessionaires.

When the CNAEE was created, the production of electric power decreased even as consumption increased. The CNAEE followed basically two different policies: to ease the restrictions of the Water Code so as to allow the expansion of the electric companies and of the respective generating plants, and to mantain the economic and financial equilibrium of these companies by means of tariffs.

In 1942, the government allowed the new use waterfalls by foreign companies that already worked in the country or for the ones that would organize themselves as national corporations.

The crisis in the energy supply, however, continued to be serious. An American technical mission took part in the plan of the Brazilian economic mobilization. The diagnosis presented by the mission found that that the electric sector was one of the factors responsible for the stagnation of the country’s development. The tariff legislation and the restriction on foreign companies were the main causes.

As a consequence of this diagnosis, in 1946 the First National Plan of Electrification determined the "regionalization" of interlinked systems. Normally, the country use to be divided into regions which would be electrically self-reliant. The Plan gave priority to small and medium-sized plants. The financial participation of the State in the Plan would be the smallest possible. The State would act as a kind of complement for the private sector.

The States of the Federation, on account of the *regionalization*, began to organize their electric power concessionaires. Besides those policies, the federal government created its own electric company, the Hydroelectric Company of the São Francisco River - CHESF -, with the main intention of building a big plant to exploit the energy potential of the Paulo Afonso Water Fall in the São Francisco River, in the northeastern part of Brazil. CHESF got a 50 year concession to use the hydroelectric energy in that river.

The creation of CHESF represented the commitment of the state to building large plants and to separating generation from distribution. That structure would be reinforced later with the creation of ELETROBRÁS (Brazilian Electric Company), where production would be expanded through large plants under the responsibility of the federal government, and the distribution of power would be through concessionaires managed by state governments.

In 1960 the Ministry of Mines and Energy was created and both the National Council of Waters and Electric Power as well as the Water Division of the Ministry of Agriculture were incorporated into this new Ministry.

In 1962 ELETROBRÁS was created, also subject to the Ministry of Mines and Energy. It was assigned to assist the development of the electric power industry in Brazil.

In 1965, the Water Division of the National Department of Mineral Production was changed into the National Department of Water and Energy - DNAEE - directly subordinated to the Ministry of Mines and Energy. Later, in 1968, it changed its name, being renamed the National Department of Waters and Electric Power - DNAEE.

In 1969, the CNAEE was extinguished and its responsibilities were absorbed by the DNAEE. The regulating body and the segment responsible for the planning function of the electric sector were directly linked to the Ministry of Mines and Energy. This change demonstrates the state's predominant in the energy sector.

The effects of the State's decision in the electric sector were felt little by little. In May 1971 a law determined that ELETROBRÁS would deal with the account of the Global Reserve, thereby giving it significant financial and strategic power. In 1973, the federal government, having in mind the feasibility of the Itaipu Plant, imposed that FURNAS and ELETROSUL, of the ELETROBRÁS group would purchase all the energy sold by Itaipu to Brazil.

2.2 The Electrical System

After the Second World War, Brazil's economic development, based on the industrialization and modernization of the country, was hastened by implementation of the import substitution of model. From 1961, after the acceptable possibilities of import substitution were exhausted, the growth rate of the national economy began to decline.

The creation of Eletrobrás in June 1962 gave rise to deep changes in the structure of the electric sector. Such changes were felt mainly after the second half of the nineteen sixties, when the period of the "Brazilian miracle" began.

In 1962, when Eletrobrás was created, the generating capacity of the country amounted to 5,728 MW; by 1986 this amount had risen to 42,860 MW as shown in table 1:

YEAR	THERMAL (MW)	HYDRAULIC (MW)	TOTAL (MW)	GROWTH RATE (%)
1963	1.876	4.479	6.355	---
1964	1,946	4,894	6,840	7.6
1965	2,020	5,391	7,411	8.3
1966	2,042	5,524	7,566	2.0
1967	2,255	5,787	8,042	6.3
1968	2,372	6,183	8,555	6.4
1969	2,405	7,857	10,262	20.0
1970	2,372	9,088	11,460	11,7
1971	2,102	10,383	12,490	9,0
1972	3,806	11,019	14,825	18,7
1973	4,260	12,438	16,698	12,6
1974	4,545	13,740	18,285	9.5
1975	4,801	16,323	21,124	15.5
1976	4,845	17,901	22,746	7.7
1977	5,346	19,544	24,890	9.4

1978	5,648	21,207	27,455	10.3
1979	6,188	24,095	30,283	10.4
1980	5,768	25,584	31,352	`3.5
1981	5,987	29,615	35,602	13.5
1982	6,003	31,168	37,171	4.4
1983	6,153	33,465	39,618	6.6
1984	3,595	34,804	38,399	(3.1)
1985	4,359	37,437	41,796	8.8
1986	4,382	38,478	42,860	2.5

Table 1. - Electric Generating Capacity in Brazil - Growth Rate

Analyzing the table, one can note not only the high rate of growth of the national generating park, but also a decrease in the use of thermal power and an increase in hydroelectric power.

In May 1971, it was legally determined that ELETROBRÁS would control the Reversion General Reserve account for application in cases of a concession reverts to the state, and as loans for concessionaires to improve and expand their services. This was the first step in transferring funds among companies.

In 1973, Law No. 5,899 dated May, 7th, also known as the "Itaipu Law", legally established the obligation of Furnas and Eletrosul purchase all the energy produced by the Itaipu Plant for Brazil. This Law also defined the universe of the public and private companies, that generated and distributed energy, and which ones were obliged to buy that energy. This law exemplified the dictatorial regime of the time and state's hold over the electric sector.

Also in 1973, CHESF, ELETRONORTE, ELETROSUL and FURNAS, under ELETROBRÁS' control, were reorganized by region. In that same year the Coordinating Groups for Interlinked Operation - GCOI - were created.

The State, either in the federal or state ambit, became the sole agent in the amplification of the electric power. The State's possession of the electric sector took place with the acquisition of the Light Group in 1979. Thus the sector was nationalized.

2.3 Suppliers of Goods and Services.

The State's intervention in the production of electric power, through the construction of big hydroelectric plants, stimulated the development of the heavy electric equipment industry .

Since Getúlio Vargas' government, when the Executive Commission of Electric Material (CIME) was created, the State tried to impel this industrial segment. In 1952, 8% of the budget of the National Electrification Plan was designed for the production of heavy electric material. In the first draft of ELETROBRÁS' constitution (1954), the second article determined that the company would be responsible for manufacturing heavy electric equipment.

Then came Juscelino Kubitschek's term as president, but few concrete results had been achieved thus far. A favorable scenario existed for the infiltration of foreign capital. In the middle of 1957, the Brown-Boveri inaugurated its plant in São Paulo. In 1960 Coemsa established itself in Rio Grande do Sul and, in 1963, General Electric and Siemens inaugurated their plants in São Paulo.

The electric material sector, both in the heavy material industry which manufactured production goods, as well as the light industry which produced durable consumer goods, held an important position in the

end of the nineteen- fifties. There were about 383 factories that employed 33,000 workers. It ranked as the seventh industry in value of sales.

In the sixties, the great demand for smaller equipment was already being met by domestic manufacturers, mostly Brazilians, who had set up business in the country.

Another segment that has had an important role in the electric power sector is heavy civil construction. State dominance of the electric sector enabled the national contractors to participate in a process that previously had been dominated by foreign companies. Until the middle of the fifties, the great hydraulic projects were designed abroad. From then on, the big national contractors, such as Camargo Correia, Mendes Júnior, Andrade Gutierrez and Norberto Odebrecht acquired great expertise in the construction of hydroelectric plants.

2.4 Consumers

The consumers of electric power performed only two roles in the electric sector: to use the energy and to pay the bill.

2.5 The economic and financial structure of the electric sector.

Throughout the years, the electric sector, which was basically state owned, had the reputation of solving its economic and financial problems by obtaining funds through the public administration, rather than simply from the sale of electricity.

As a part of the state's productive sector, it followed price and investment policies determined by the government. On the other hand, the government always allowed the electric sector to have financing sources outside the state. Thus, in the financing of the sector's expansion, there is the participation of resources from the federal government, from state and municipal governments, and from other items such as different taxes like the *Imposto Único sobre Energia Elétrica* (IUEE), the *Reserva Global de Reversão* (RGR) and the Compulsory Loan. Such items can be understood as a means of providing financial support for the sector.

On November 28, 1962, law no. 4,156 established the compulsory loan and reformulated the collection of the IUEE. It became the principal financial aid for the sector.

The law established that the compulsory loan would be collected for a period of five years. It was set at 15% of the consumer's bill up to 1964 and at 20% in the following years. As a counterpart, the consumers would get Eletrobrás bonds callable in ten years at 12% interest rate. From 1971 on, this compulsory loan was charged to industrial clients only, at a rate of 35% of the weighted average of national tariffs (fiscal tariff). The tax was repeatedly extended until December 1993.

As for the collection of the IUEE, different rates were established for rural, residential, industrial and other consumers. As a basis for the calculus the fiscal tariff was adopted.

The Global Reversion Reserve (RGR), created in 1971 by means of law no. 5,655 was another item intended to capture resources. The RGR provided financial aid in case a concession reverts to the state. Managed by Eletrobrás, the RGR included accumulated interest payments from the Reversion Fund that the concessionaires had invested up to December 31, 1971, plus the interest payments that the holding company had made over the sum of RGR invested as an endowment.

Besides these financial resources created in the sector itself, other aspects must be taken into account in order to understand the finances of the electric sector. In November 1964, monetary correction of the original value of fixed assets became compulsory for concessionaires of electric power. The repercussion of this requirement was great because the fixed assets represented the highest cost and, as such there, would be a significant rise in tariffs. Until 1967, the tariffs grew, on

average, 62.4% a year, while inflation averaged 39% in the same period. From 1967 on, the government's greatest worry was the country's economic growth. There was no restriction as to tariff readjustments for electric power, which were kept, generally speaking, well above in the inflation These resources represented a significant source of financing for the sector.

From 1973 on, with the great jump in oil prices, the government began to constrain electric power tariffs, so as to hamper its increase and to stimulate the use of electricity instead of oil by-products. As a consequence the electric sector began to lose money.

Until 1974, the tariffs of electric power were different in different geographic areas according to the costs of the service performed. The concessionaires that met the needs of a concentrated and localized market in a small area had lower costs, and consequently lower tariffs. The differences among the tariff levels were large enough to influence the decisions about the location of economic activities, especially industrial ones.

Hydroelectric plants were located farther and farther away from the great centers, with growing expenses of transmission and distribution of energy, causing an increase in the tariffs of areas with concentrated a market.as the government adopted, from 1975 on, the process of tariff equalization, it created the possibility of geographical displacement of economic activities and of power generation.

Together with tariff equalization, the sector adopted other measures related to the operation of the electric systems, the principal goal of which was to diminish the sector's global costs by using more hydraulic power and less thermoelectric power.

Aiming to meet the needs of the whole interlinked system, in terms of thermal generation as a complement of hydraulic generation, the Account for Fuel Consumption (CCC) was created and it became a financial reserve to cover the cost of fossil fuels. Such a reserve was obtained through the contribution of all the companies that integrated the interlinked systems, proportionally to the energy that they sold.

In order to make the tariff equal in the whole country, the Guaranteed Global Reserve (RGG) was created in 1974. It was formed through the contribution of all the concessionaires, with quotas of up to 2% over the "fixed reversible". The RGG was deposited in an account belonging to Eletrobrás and it was used by authorization of the DNAEE. Its objective was to provide the economic and financial stability of those companies that would spend more than they would receive. This mechanism acted as a transfer system.

Another meaningful loss of profit was represented by the reduction of investment remuneration taxes.

The Decree 1,506 changed the way of evaluating the companies' fixed assets. The new procedure reduced the internal generation of resources because it lowered the companies' average return on investments: 11.2% in 1977, 11% in 1978, 9% in 1979 and 6% in 1980. As a consequence, in order to continue the growth of the electric system it was necessary to find financial resources outside the sector.

During the beginning of the eighties, the financial situation became even worse. The tariffs were constrained as part of the fight against inflation. The generation and transmission projects that were not part of the sectoral planning were used as instruments to obtain foreign exchange so as to face the country's balance of payment crisis.

3. THE PRESENT SECTOR

The federal government is in charge of the generation of energy through the companies of the Eletrobrás group and the Binational ITAIPU. Most generation is still hydraulic. It makes up 96.43% of the available energy, as shown in table 2.

	1994 (MW)	1995 (MW)	94/95 (%)
A- Gross Generation	239,467	250,480	4.6
Hydraulic (including 50% of Itaipu'sgeneration)	1401	1312	(6.4)
Thermal:	1847	2,808	52.0
Fuel oil	0,0	0,0	0.0
Diesel	55	2,519	4.580
Natural gas	3,105	3.559	14.6
Nuclear	6,408	10,198	59.1
Mineral coal	245,875	260,678	6.0
Total thermal			
Total Gross Generation			
B. Itaipu (exceeding amount from the 50%)	31,767	35,208	10.8
C. Self-producers	447	382	(14.5)
D. Available Energy (A + B + C)	278,089	296,268	6.5
Table 2. Origin of the Generated Electric Power in Brazil			

This generated energy meets the needs of a market growing at a rate of 6% per year. The residential sector is responsible for the high rate of growth in the consumption of electric power. The northern and mid-western regions have the highest growth rates.

		Industrial	Residential	Commercial	Others	TOTAL
	1994	6,970	2,134	1,128	1,274	11,506
NORTH	1995	7,186	2,625	1,354	1,398	12,563
	95/94(%)	3.1	23.0	20.0	9.7	9.2
	1994	19,632	7,721	3,954	5,603	36,910
NORTHEAST	1995	19,367	8,958	4,428	6,055	38,808
	95/94(%)	(1.3)	16.0	12.0	8.1	5.1
	1994	73,090	33,358	17,468	17,830	141,746
SOUTHEAST	1995	73,617	37,515	19,272	18,692	149,096
	95/94(%)	0.7	12.5	10.3	4.8	5.2
	1994	14,452	8,910	4,365	6,839	34,566
SOUTH	1995	15,225	9,981	4,872	7,373	37,451
	95/94(%)	5.3	12.0	11.6	7.8	8.3

	1994	2,612	3,829	1,966	2,492	10,899
MIDWEST	1995	2,569	4,443	2,216	2,711	11,939
	95/94(%)	(1.6)	16.0	12.7	8.8	9.5
	1994	116,756	55,952	28,881	34,038	235,627
BRAZIL	1995	117,964	63,522	32,142	36,229	249,857
	95/94(%)	1.0	13.5	11.3	6.4	6.0

Table 3 - Electrical energy consumption (Gwh) - 1994/1995

Utilities meet the needs of this energy market, and they are distributed this way:

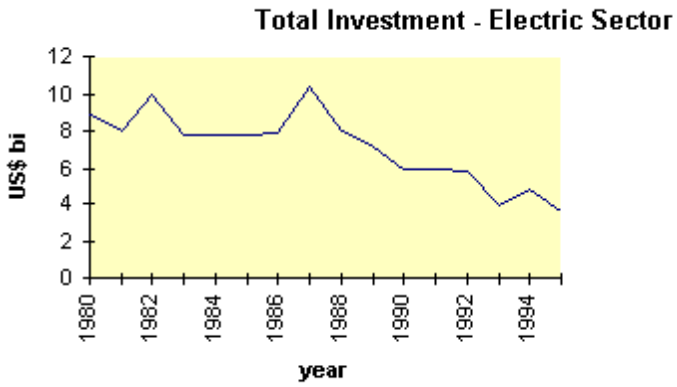
FEDERAL	CEB (DF)	ELETROACRE (AC)	HIDROPAN (RS)
CHESF (PE)	CEEE (RS)	ELETROPAULO (SP)	JAGUARI (SP)
ELETRONORTE (DF)	CELESC (SC)	ENERGIPE (SE)	JOAO CESAR (SC)
ELETROSUL (SC)	CELG (GO)	ENERSUL (MS)	LIGHT (RJ)
FURNAS (RJ)	CELPA (PA)	SAELPA (PB)	MOCOCA (SP)
MUNICIPAL	CELPE (PE)	**PRIVATE**	NACIONAL (SP)
CELB (PB)	CEMAR (MA)	BRAGANTINA (SP)	NOVA PALMA (RS)
COCEL (PR)	CEMIG (MG)	CAIUA (SP)	SANTA CRUZ (SP)
D.E. de IJUI (RS)	CEPISA (PI)	CATAGUASES (MG)	STA. MARIA (ES)
DME (MG)	CER (RR)	CELTINS (TO)	SUL PAULISTA (SP)
ELETROCAR (RS)	CERON (RO)	CENF (RJ)	SULGIPE (SE)
BINATIONAL	CESP (SP)	CERJ (RJ)	URUSSANGA (SC)
ITAIPU	COELBA (BA)	CFLO (PR)	XANXERE (SC)
STATE	COELCE (CE)	CHESP (GO)	VALE
CEA (AP)	COPEL (PR)	CPEE (SP)	PARANAPANEMA
CEAL (AL)	COSERN (RN)	ESCELSA (ES)	(SP)
CEAM (AM)	CPFL (SP)	FORCEL (PR)	OTHERS

Table 4 - Utility Companies in Brazil

Despite being one of the best sectors in Brazil's infrastructure, the electrical sector demonstrated signs of a need for changes.

It is important to analyze the electrical system investments and their consequences. Even considering the 1980's as "the lost decade," there were more investments made in that decade than in the first half of the 1990's. In the 1980's, the annual average in investments was US$ 8.3 billion, while in the first half of the 1990's they were US$ 4.9 billion. In 1995, only US$ 3.6 billion was invested, this figure represents the lowest level since the 1970's.

This data, shown in the following graph, characterizes the government's inability to invest sufficiently to ensure expansion and improvement of services.



As a consequence, two indexes reflect an undesirable evolution of the electrical system: the shortage risk and the loss.

The shortage risk index reflects the possibility that the electrical system would not meet market needs.

If the market is predetermined, the shortage risk index will be affected by the investment and the availability of fuel used in generation of electrical power.

The greater the investment, the lower the sortage risk index. In the same way, the greater the availability of fuel, the lower the shortage risk index.

Throughout the years, a crisis in electrical energy supply was avoided due to the following reasons: the recession which affected the Brazilian economy until 1994; the propitious hydrological conditions (except in the north eastern region in 1986), and the completion of some generation projects that were initiated in the early 1970's. Also, some mistakes have helped the electrical sector: the methodology applied in forecasting the energy needs induced companies to overestimate demand and economic growth because of overly optimistic forecasted by government.

Despite these mistakes, the electrical system still has a high shortage risk index forecasted for the coming years, as indicated in table 5.

Table 5 - Annual Energy Shortage Risks (%) (*)

Year	S/SE/MW Interconnected System		N/NE Interconnected System	
	(1)	(2)	(1)	(2)
1996	3	1	1	-
1997	8	4	1	-
1998	10	6	1	-
1999	11	6	1	-
2000	6	2	1	-
2001	4	2	2	1

2002	3	1	5	2
2003	4	1	5	2
2004	4	2	5	2
2005	5	2	6	3

Source: Ten-Year 1996-2005 Expansion Plan

(*) Based upon average annual growth rates of 5.7%

(1) Any shortages

(2) Shortages in excess of 10% of market demands.

The second one is the electricity loss index which indicates produced, but not sold, energy. This loss happens because of technical and commercial issues.

Technical losses occur due to bad maintenance, to a lack of improvement in the electrical system, and to energy losses during transmission.

Commercial losses occur due to the difficulties in metering energy used by consumers. In practice, it means commercial losses are often associated with theft; this practice represents a complex social problem when it occurs with low-income people. Theft also occurs in other sectors, and it requires that direct control measures be taken. In other cases, some utilities do not have enough meters and electrical companies have decided not to install them for low-income residential users.

The electricity loss index is a significant indicator of the performance of an utility. The Brazilian annual average in that index has been increasing, with some utilities reaching levels over 20 percent, while the normal range is from 10% to 12%. The following table shows the losses in Brazil's electrical system:

Table 6 - Evolution of Total Electrical Energy Losses

REGION/UTILITY	LOSS (%)						
	1988	1989	1990	1991	1992	1993	1994
NORTH							
ELETRONORTE	13.5	17.8	18.5	20.1	22.6	23.5	25.0
CELPA	18.4	18.9	18.2	20.3	22.2	24.6	25.0
NORTHEAST							
CEMAR	21.9	21.2	18.5	19.3	18.2	20.1	14.0
CEPISA	14.8	15.0	14.7	14.5	16.4	17.2	22.0
COELCE	12.0	12.8	11.6	11.5	11.4	12.6	12.0
COSERN	12.6	13.8	12.3	13.4	13.8	17.1	17.0
SAELPA	15.8	15.8	15.6	15.7	19.7	21.2	20.9
CELPE	12.1	11.9	12.7	13.0	13.1	14.8	15.7
CEAL	15.2	16.8	7.8	20.2	13.8	17.5	18.9

CEAL	15.2	16.8	7.8	20.3	12.8	17.5	18.0
ENERGIPE	9.7	10.9	12.4	11.0	13.3	13.1	14.0
COELBA	11.4	12.2	10.0	14.6	13.8	14.2	15.1
SOUTHEAST							
CEMIG	8.9	9.6	8.8	9.5	9.0	10.0	8.2
CERJ	17.3	17.7	16.4	16.5	19.4	23.4	25.2
CESP	4.3	3.4	2.4	3.0	3.3	3.7	3.4
CPFL	6.8	7.0	6.3	6.6	5.5	6.3	6.9
ELETROPAULO	6.4	7.5	6.4	7.4	8.3	7.9	8.7
ESCELSA	7.2	7.7	9.4	9.8	10.9	11.4	12.6
LIGHT	12.8	14.5	13.6	14.2	14.1	13.9	15.5
MID-WEST							
CEB	5.6	6.8	7.5	7.9	8.9	9.5	10.5
CELG	15.1	12.9	13.1	14.5	16.3	16.9	17.6
CEMAT	17.4	17.6	17.3	19.6	23.0	25.3	25.8
ENERSUL	15.6	14.6	13.4	16.2	15.3	14.9	14.8
SOUTH							
CEEE	12.5	12.3	11.1	11.2	11.4	11.0	11.8
CELESC	7.2	7.2	7.0	7.0	7.1	7.9	7.9
COPEL	7.5	7.4	6.8	8.7	7.4	6.7	6.2
BRAZIL	13.2	13.4	13.0	13.8	13.7	14.6	15.3

Source: CCON,1995

This brief analysis shows that total electrical energy losses have been increasing and there is a need to intervene in the electrical sector.

4. THE ELEMENTS RESPONSIBLE FOR THE DISRUPTION OF THE PRESENT MODEL

In 1987, the Institutional Revision of the Brazilian Electric Sector (REVISE) was created. There was an evaluation of the economic crisis that started at the beginning of the eighties: the high cost of foreign money; the high indebtedness of the companies; the growth in the debt of the companies from São Paulo to the federal government companies, among others. The great issues of the Revision were the Union's role and the transfer of funds among sectors. The model, with a strong state participation, was outdated, and the 1988 Constitution set in motion the necessary changes. Since then a new model has been evolving for the Brazilian electric sector.:

* Article 174 of the 1988 Federal Constitution,

> "The Union shall be directly responsible, or under a regime of concession or permission, always through bidding, for the performance of public services.

> The law shall regulate:
>
> I - the regime of the concessionaires for public services, the special character of their contract and its extension, as well as the conditions of expiration, supervision and termination of the concession or permission;
>
> II - consumers' rights
>
> III - tariff legislation
>
> IV - the duty to maintain an adequate service".

Up to that time, the State held the concession for the production and commercialization of electric power. The constitution, in its article 175, asked that bidding determine which companies would render public services by means of a concession or permission. This article opens the possibility of private capital rendering public services. The specific laws were left for subsequent legislative action. The monolithic structure of the state began to crack.

* Article 155 of the 1988 Federal Constitution.

Creation of the Tax on Circulation of Goods and Services (ICMS) that incorporated the Single Tax on Electric Power (IUEE) among others.

The creation of this tax meant a significant loss of revenue for the sector because the IUEE revenue had been reinvested directly in the sector while the ICMS revenue was transferred to the State and could be used in other programs.

* Law 8,631/93 and its regulation by means of Decree 774/93.

It permits differentiated tariffs and determines their levels; it extinguishes the guaranteed remuneration; it allows the settlement of accounts between the concessionaires and the Union through Accounts of Results to be Indemnified.

The application of this law means concessionaires must be efficient. The concessionaires' commission will be guaranteed only if it shows efficiency.

* Decree 915/93

This decree allows the formation of consortia for the generation of electric power to be used in the partners' units, and the surplus to be sold, but only to the Union. One can still notice a strong role for the State;

* Decree 1,009/93

It creates the National System of Electric Power Transmission (SINTREL), made up of the transmission systems controlled by ELETROBRÁS that integrate of the interlinked systems of the South, Southeast, Midwest and Northeast. It tries to create conditions for the use of this system by concessionaires and by self- producers.

The SINTREL is structured as an institutional pact coordinated and managed by Eletrobrás. Through this open transmission system, the distribution companies or the great consumers can have access to the energy of any national source.

* Imposition of the requirements of Brazilian nationality or of Brazilian company of national capital for the maintenance or receipt of a concession for the exploitation and utilization of hydraulic power for the use of public services of electric power.

It was a negative imposition that inhibited to private capital from participating in the electrical sector. That imposition was broken by the constitutional amendment redefining the concept of national enterprise, eliminating restrictions in posed on foreign investors.

* Law 8987, dated February 13, 1995, deals with the concession of public services and leads to the opening for private capital. At this point the state's monopoly over generating or distributing energy was broken.

This law also terminated all the concessions granted without bidding, and all works or services on which no had works even begun. As a consequence, the federal government signed two decrees extinguishing 33 generation concessions, liberating about 19,000 Mwfor competitive bidding.

* Law 9, 074, dated July 7, 1995, established rules for granting and extending concessions and permissions of public services; it created the role of the independent producer and the self-producer; it extinguished the monopoly by region by allowing consumers to choose where to buy electric power; it offered suppliers and consumers free access to the transmission and distribution systems of the concessionaire of public service, by means of indemnity of the cost of transportation calculated on the basis of criteria established by the concessionaire; it offered conditions for the enterprises of rural electrification, the area of which was situated inside a concessionaire's area, to be recognized as renderers of public service and as such to become concessionaires.

* Decree No. 2,003, dated September 10, 1996.

It coordinates the production of electric power by an Independent Producer and by a Self-Producer, setting the rules that will allow the participation of private enterprise in the generation of electric power, be it of hydraulic or thermal origin.

The independent producers and self- producers shall have free access to the transmission and distribution systems of the concessionaires by paying the cost of energy transportation. The regulating agent shall define the criteria for determining the cost of such transportation.

* The National Agency of Electric Power - ANEEL

An autarchy is being created as a regulatory agency to allow the State to perform its real role as a coordinator. Linked to the Ministry of Mines and Energy, this agency has its own and distinctive characteristics in relation to the DNAEE, which will be abolished :

1. Its directors are nominated by the President after approval by the Senate. They will stay in office for no longer than 4 years.

1. People who have any kind of relationship with other entities of the sector are not allowed to administer the autarchy. The old DNAEE was administered by employees from the concessionaires in order to create some form of subordination between them and the regulating agent.

1. The ex-director of the ANEEL is forbidden to render services to the companies under his jurisdiction for a period of 12 months after leaving office, in which period he will continue to be subordinated to ANEEL.

1. Dismissal without reason of its director can happen only in the first four months of his mandate, at the end of which time he has secured the right to remain.

1. It determines that the supply of energy will be stopped for consumers who fail to pay their bills, regardless of whether or not they are public service entities.

6. It establishes the "management contract" to control and evaluate the administrative performance of autarchies and to render the accounts of the Ministry of Mines and Energy and of the ANEEL.

The ANEEL is created as an independent body since the management personnel have no relationship with the concessionaires; its directors cannot be dismissed without reason after the fourth month of commission; the administrative contract determines its directors' duties and that means that, if they have been fulfilling their obligations, there is no reason for them to be dismissed from their jobs, thus eliminating the traditional casuistic issues.

All those legal changes permit one to affirm that the Brazilian electrical sector is leaded in a new direction.

5. THE IMPLICIT MODEL

Despite the changes that have happened in specific laws of the electric sector, the new model has not been defined yet.

In order to enhance the above mentioned process the Ministry of Mines and Energy (MME) contracted with IRDB resources the consultant, Coopers and Lybrand, to define the new model.

In this chapter there is an attempt to forecast what the new model will be, taking in consideration the law recently approved as well as the trends in other countries.

Traditionally the electrical system is "verticalized" and well defined into areas of transmission and distribution. To be "verticalized" means that one company produces energy and another buys it, there usually is a strong tie between them, completely eliminating any possibility of competition.

The newly approved laws signal the break up of the "verticalized" structure. In this way, for instance, a model similar to the one used in the United Kingdom can be adopted, which is named "multi - seller and multi - buyer." Such a model is characterized as having not only one producer but several, as well as each distribution company deciding its own requests and where to buy energy. The purchase can be made in a bilateral way, among several companies at the same time.

The United Kingdom had the first experience in separate distribution and supply functions. The monopoly in generation and supply in England and Wales was ended by the Electricity Act of 1989, which created an entirely new framework for the industry:

Þ The Central Electricity Generating Board (CEGB), the owner of the majority of generation plants, was divided into three competing generating companies - National Power, PowerGen and Nuclear Electric, with the National Grid Company, as a transmission company.

Þ The twelve Area Electricity Boards had the monopoly in their concession areas broken, but they were allowed to generate a portion of their own electricity. They were transformed into twelve Regional Electricity Companies (REC).

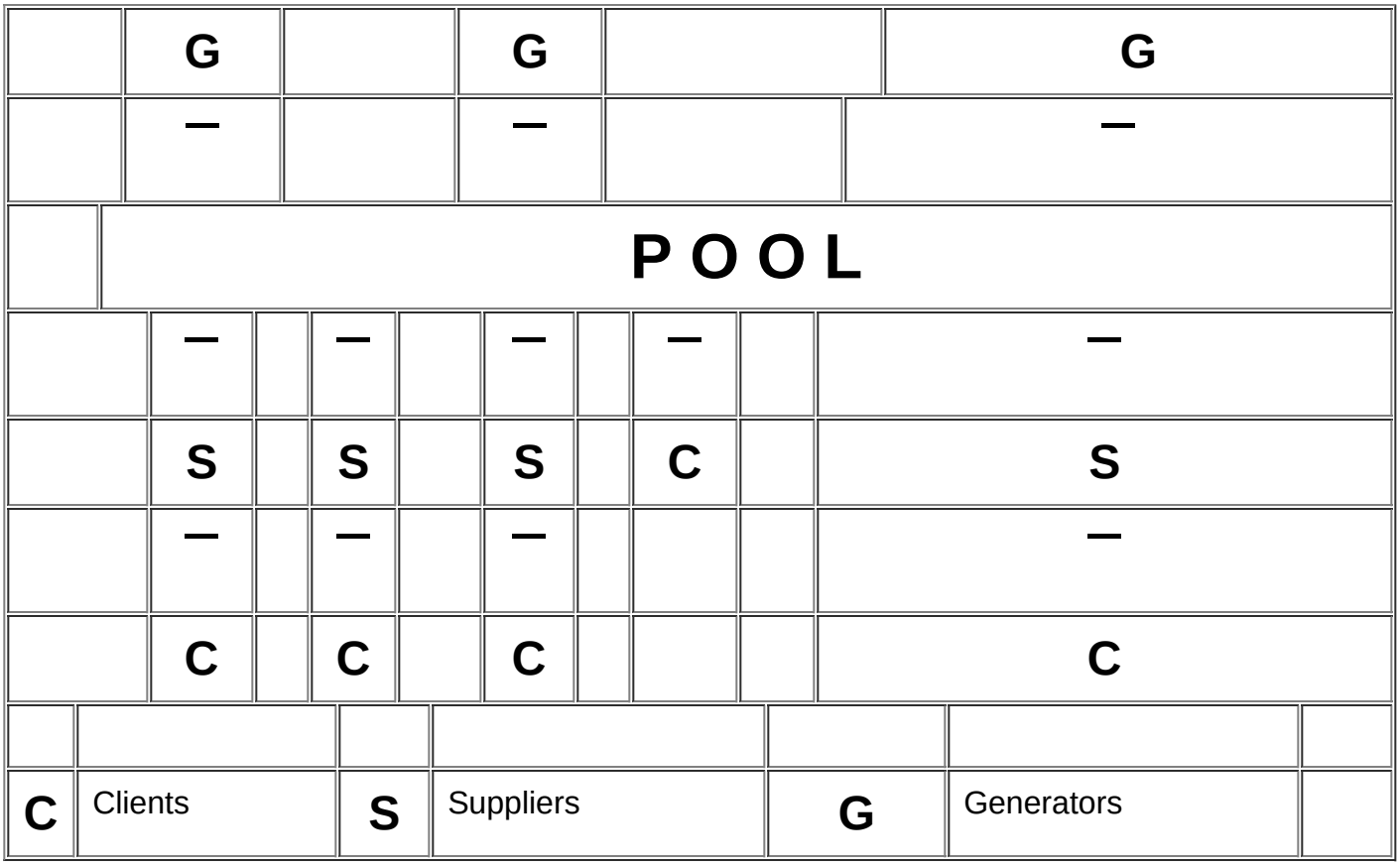
Þ Independent producers were granted equal rights of access to the transmission and distribution networks

Initially, customers with demand higher than 1MW were free to choose their supplier. That request was reduced to 100 kW in 1994 and is scheduled to be eliminated altogether in 1998, permitting consumers to choose their suppliers freely.

In accordance with approved law, the same will probably happen in Brazil. In fact, it represents the introduction of competition in the Brazilian electrical sector.

But, what does competition in the electrical sector mean?

For a better understanding, one can analyze the model presented below:



Picture 2 - "Multi seller and Multi buyer" Model

Producers supply electric energy that is shared within a pool to be used by the distribution companies and large consumers.

Law n^0 9074, July 07, 1995, allows this kind of procedure. It created the concept of independent producer (IP). Decree 2003, Sep. 20, 1996, regulated the independent producer and the self-producers (SP). It permitted their access to the transmission and distribution systems. As a consequence the number of producers will be increased, directly affecting the energy supply and the buying options.

On the other hand, some consumers will have the right to choose their suppliers. According to the same law, consumers with a load greater than 10,000 kW will be able to choose their supliers after July 1998. The same will apply to consumers with loads greater than 3,000 kW, after July 2000.

Although it seems easy to outline the characteristics of the basic model, many problems need to be solved before its implementation.

The structure of Coopers and Lybrand’s work was established to indicate solutions about the following subjects:

Trading model,

Sector structure,

System Operation,

Legal implications,

Regulatory framework,

Subsides and crossed subsides,

Transmission charges,

General rules of competition,

Economic regulation,

Preliminary ideas

ANEEL's organization,

Concessions policy

Numerous questions have arisen throughout the development of the work, and there is a need for serious negotiation in order to establish and implement the new model. For instance, would the states intervene in the process of defining the basic network for the sake of their own interests?

What will the interference of the government economic area be when defining tariffs? The less the political interference, greater the confidence of the private sector in participating in the business.

With the "de-verticalization", how will the cross subsidy be treated?

These kind of questions must be adressed by the Brazilian Congress which has been the real responsible for remodeling the electrical sector**.**

6. THE TENDENCIES OF THE ELECTRICAL SECTOR

6.1 The expansion of the electric system

The ten-year plan (1996/2005) established a generation, transmission and distribution plan so as to expand the electric system.

Supplying criteria; financial resource availability; and the physical feasibility of the venture, including environmental issues were considered. Strategies of expansion; the interlinking of systems; the use of other forms of energy, such as natural gas and coal; and interchanges of energy with bordering countries were also considered.

The recent modifications in legislation affecting the sector had a great impact on the planning of electric systems. In the new context of bidding for public services, the sequence of work is considered in the light of economic feasibility without taking into account, beforehand, the eventual concessionaire.

The macroeconomic projections are for 5% average annual growth in gross domestic product from 1996 to 2005. In this scenario, in the elaboration of the expansion plan, the average growth rate foreseen by the concessionaires for the total consumption of energy was of 4.7% a year. The market forecasts took into account the impact of energy conservation and of the self-producers. Although the forecasts reflected the concessionaires' estimates, they were rather conservative, implying the need to consider an alternate forecast. This second forecast projected an average annual growth of 5.6% in electricity demand from 1996/2005, indicating the need for supplementary work and greater investment when compared to the previous projection:

Table 7 - Electric Energy Consumption - Conservative Scenario

	Market	Growth

Region	Market			Growth Rate
	1995 (10^6 MWh)	2000 (10^6 MWh)	2005 (10^6 MWh)	(%)
South/Southeast/Midwest	191.4	234.4	288.2	3.9
North/Northeast	48.6	66.2	90.7	6.4
North alone	2.0	3.7	6.3	12.2
TOTAL BRAZIL	242.5	304.3	385.2	4.7

Source: Ten years plan - 1996/2005 - Eletrobras

Another important aspect that was considered in the planning of the Brazilian electric system is the interlinking of electric systems in the northern and southern regions of the country. As a matter of fact, the interlinking of North/South represents the connection of the North/Northeast system to the South/Southeast system that thus combined represents 98% of the total consumption of electric power in the country.

The interlinking will be done through a transmission line of 500 kV, probably in alternating current, with approximately 1000km of length and interchange capacity of 1000MW. This line will allow the interlinking of the hydroelectric plants that will be erected in the Tocantins River Basin.

The continental extension of this transmission line represents the possibility of transferring the energy from the northern region to the northeastern, southern and southeastern regions that have been steadily growing.

The process of electric power transmission among regions goes beyond the borders of Brazil and the interlinking with neighboring countries has become a goal in the electric planning. These connections will meet the demands for integration.

In the northern region, Venezuela already supplies electric energy to Manaus and Boa Vista. In the southern region, where the effects of the Mercosul are more strongly felt, following interlinkings exist:

- Brazil - Argentina, Uruguaiana converter (50 MW) already operating,
- Brazil - Uruguay , Santana do Livramento converter (70MW), to begin operation in 1998,
- Brazil - Uruguay in extra-high-voltage (300 MW), to begin operation in 1999.
- Brazil - Argentina in extra-high-voltage to begin operation in 1999.

The need to guarantee an adequate supply for the expected market led the planners to take into account the use of natural gas for the generation of electric power in the country.

As an alternate project for supplying the northern region, the natural gas from Urucu will supply Rondônia, Acre, Manaus, Macapá and Pará (left bank of the Amazon River). In the specific cases of Manaus and Boa Vista, there is the possibility of interlinking with Venezuela, which would be economically more efficient.

In the southern/southeastern region, there is the possibility of using some of the Bolivian natural gas for the expected consumption of 4 million m^3 a day, which will increase the supply of energy through

thermal generation in the interlinked system south/southeast/mid-west:

Mato Grosso do Sul: 160 MW, 640m3 per day

Mato Grosso: 225 MW, 900 m^3 per day

São Paulo/Rio de Janeiro: 900MW, 3,600 m^3 per day.

Other energy uses in the planning of the Brazilian electric system were considered: the National Program of Small Electric Plants (PNCE) intends to invigorate the expansion of small enterprises in the isolated systems of the northern region; the forest biomass may be received in the Northeastern region, where a thermal plant of 30MW is being erected in the State of Bahia; for the electrification of the rural areas, programs of solar and aeolian energy are being developed, especially in Ceará with two aeolic parks of 30 MW each.

To assure the realization of these plans, investments of some US$6 billion per annum will be needed, as show in the table 8.

Table 8 - Investments necessary to expand electrical system ($ billion).

	1996	1997	1998	1999	2000	TOTAL
Generation	2.7	3.7	3.5	3.3	3.2	16.4
Transmission	1.4	1.7	1.6	1.6	0.8	7.1
Distribution	1.2	1.2	1.2	1.2	1.2	6.0
General Inst.	0.4	0.5	0.6	0.6	0.6	2.0
TOTAL	5.7	7.1	6.8	6.7	5.8	32.1

Source: Ten years plan - 1996/2005 - Eletrobras

6.2 The participation of energy conservation

The electricity component in the Brazilian energy matrix has been behaving unusually in relation to the other energy components since the beginning of the seventies. At that time, when there was a "fever" to expand the national electric generation system, there was an adequate supply of energy even though the world suffered from the first oil embargo in 1973. The price of a barrel of oil went up from US$2.50 to US$12.00.

At the time of the second oil embargo, in 1979, high inflation was already a bad reality for the Brazilian society and barrel of oil reached the astronomical price of US$28,00 in the international market.

In order to face these problems - the need to find alternate sources of energy and to fight inflation - the government tried to constrain the tariffs of electric energy

The role of electricity could be analyzed also from the point of view of technological improvements: wood stoves in industry began to be replaced by electrical ones, kerosene refrigerators in the rural areas were replaced by electrical ones, and several modern electrical commodities entered the life of the common citizen. The consumption of electricity per capita grew from 399 kWh per citizen in 1970 to 647 in 1975 and to 1,012 in 1980. All these aspects caused electricity to have a greater role in the national energy matrix.

The oil embargoes taught humanity how to use energy efficiently. Mainly in the developed countries, it became vital not to waste energy. And so nations tried to assure the growth of their gross domestic product without increasing energy consumption. Their domestic product grew significantly while the consumption of energy increased more slowly. Some countries, such as Japan, at certain times, were even able to reduce the consumption of energy (negative rate) and maintain economic growth.

However, in Brazil the consumption of energy continued to increase quickly as the country developed. The consumption was stimulated and its growth rate was greater than that of the gross domestic product.

If one could compare what happened in Brazil with what happened in the developed countries, one would come to the conclusion that there was a large waste of energy in Brazil, especially of electricity.

Stopping this waste became vital. There was one "virtual" plant available, without environmental or financial impact and compatible with all modern quality programs.

The option to make use of the "virtual" plant depended on the client, who needed to guide his behavior in search of the efficient use of energy.

Energy conservation was then understood to be the use of a smaller amount of energy to get the same product, service or comfort, by eliminating waste and changing habits, by the use of more efficient equipment and by the improvement of production processes.

In Brazil the conservation of electric energy has been sponsored by the National Program of Electric Power Conservation (PROCEL) created in 1985.

During these ten years, PROCEL has achieved positive results in the conservation of energy and it has had an important role in the planning of the electric sector because of its characteristics: the cost of the majority of conservation projects is less than the cost for an equivalent expansion of the electric system; the time limit for investment rewards and the period for the maturing of projects is shorter than the erection of hydroelectric plants. Another relevant factor in favor of conservation is that the investments can be done with the clients' own resources.

Table 9 - Brazil - Perspectives of Energy Conservation

Year	Industrial (10^3 MWh)	Residential (10^3 MWh)	Commercial (10^3 MWh)	Public Lights (10^3 MWh)	Total (10^3 MWh)
1996	1,831	399	744	402	3,375
1997	4,054	839	1,559	776	7,228
1998	4,922	974	1,810	825	8,531
1999	5,943	1,143	2,120	858	10,064
2000	7,191	1,345	2,479	876	11,891
2001	8,747	1,577	2,892	935	14,152
2002	10,444	1,847	3,377	1,006	16,675
2003	11,529	2,014	3,678	1,020	18,242
2004	13,328	2,330	4,238	1,102	20,998
2005	15,188	15,188	4,847	1,168	23,871

Notes: 1. 1996/1997- Procel's Goals

2. 1998/2005 - Forecasted by Procel

This way, the national electric sector began to integrate the actions of energy conservation in to the planning of the electric system, the present 2005 plan, where the numbers show the existing "virtual" plant.

6.3 The Regulatory Agency

The expected independence of the new regulatory organ in Brazil - the ANEEL - will allow the citizen to be protected by a state agent and not by a government administration that has a short span of time. The administration contract and the non-coinciding mandate of its directors give the citizen the certainty of the regulating agent's independence.

For the entrepreneur this means the definition of rules that so far had never existed and confidence in the investment of his capital.

For the electric sector, it means the definition of the state in its role as regulator and of the private sector as administrator.

6.4 The suppliers of goods and services

Traditionally the suppliers of goods and services have been the designers, builders and equipment manufacturers. However, the new model of the Brazilian electrical sector suggests new "profiles" to be added to this list.

Merchants of Electric Power

As in the Stock Market, the client decides from whom he wishes to buy the energy. Depending on how it works, there would be a dispatch where energy blocks will be bought and competition among sellers will be established. Such a structure will require a new type of business administrator capable of understanding processes, engineering, contracts, tariffs, one who would have political and economic vision and client awareness.

Consultants in Energy Efficiency

As ANEEL is being created consideration is being given to the establishement of a tax that it would collect from the utilities. Such a tax will be influenced by utility's efficient use of the electrical system.

Consideration is being given also to financing energy conservation efforts.applied in energy conservation.

Both considerations stimulate the creation of ESCO's - Energy Services Company and Non-Governmental Organizations

6.5 The Clients

The client has become the focus for the whole process of change. He is acknowledged, valued and sought out. Two new bodies created recently corroborate this new consideration for the client: the Code for the Defense of the Consumer and the Council of Energy Consumers linked to the distribution concessionaires. A number of clients are not already compulsorily linked to a concessionaire. The right to choose his own supplier will have a great impact in the market of electric power.

As far as the energy market is concerned one can foresee the following behavior:

Residential: Government action in the electrical sector will still be fundamental, enabling low income population to have access to energy. The clients who already have electric power shall increase their consumption in a rational way, using new electrotechnologies changing habits to make the electrical system more efficient.

Industrial: It will not have the same growth rate as in the period of the "Brazilian Miracle". Although the international private capital still views Brazil as a promising market, industry shall have a stable share of the market of electric power.

Commercial: The service sector has a branch with greater expectations of economic growth. The incentives for public servants to resign from their jobs has caused the appearance of small businessmen in the services field. In the energy market, this segment of the population will certainly join forces.

6.6 Policies in the Energy Sector

The changes that have been happening in the electric sector are being introduced by the Congress. As for ANEEL, the original proposal from the executive power reflected old-fashioned ideas, like the creation of a Council of Electric Power Public Service, also linked to the Ministry of Mines and Energy, intended to supervise ANEEL's performance. The creation of this council was not approved by the legislative power.

This pattern of action will probably continue in the future definition of this sector, e.g., in the definition of the organ that will operate the basic interchange circuit between concessionaires and consumers. What will this organ be? Will it be a company like Eletrobrás or will there be a conglomerate to administer the operation of the basic circuit?

If the legislative power keeps its present stand, the state will be defined out of its entrepreneur role.

7. A BALANCE AFTER CONCESSION LAWS APPLICATION

Two years after the concession laws were passed, one can affirm their success.

At that time, there were 23 plants with delayed construction. All of them have already had their plans for conclusion presented and approved by DNAEE. One of them is in operation, 11 plants had their construction restarted, 6 plants had their construction contracted but not yet restarted, 3 plants are in the constructing company selection process, and 1 plant is in a bidding process for a new concession. The last one is Angra II Nuclear Power Plant which, in October/1996, had its civil engineering works about 87% completed and 16% of its electro-mechanical/nuclear assembled.

In relation to Conclusion Plans approved by DNAEE, private initiative will invest about US$ 7,063.7 million in those delayed projects, while the public sector will invest US$ 2,517.5 million.

The concession and construction information was updated in February/1997, in annex 2.

In relation to utilities most of the States are moving to privatize them. Escelsa and Light from Federal Government and Cerj from Rio de Janeiro Government were privatized for US$ 3,200 million in total.

The tables in the annex show the privatization status of state utilities.

8. CONCLUSIONS

The model of the Brazilian electrical sector is not ready yet, but some conclusion can be stated:

a) The Brazilian electric sector is definitely open to private capital and the State's funds can be invested in the programs related to its role.

b) The legislative power has been responsible for the significant changes that have been taking place, due to the liberal characteristics of President Fernando Henrique Cardoso's government.

c) The improvement of the electric system is relevant in the new model where financial resources cannot be wasted.

d) Thermal generation will grow with the increased use of natural gas. All the international interests pressing the application of this technology may stimulate its prompt installation.

e) The client will have an important role in the new model.

f) Efficiency in the Brazilian electrical sector will be assured by competition, where possible; and by regulation, where needed.

The consequence of competition is that some positive results have been obtained.

As announced in Gazeta Mercantil on March 31,1997 , the AES Corporation has offered the lowest price to CEEE (Rio Grande do Sul's utility) winning the bidding of a thermal plant in Uruguaina with a capacity of 450MW.

Its price was US$ 29.21 per MWh, while the price of its competitor was US$ 34.68 per MWh. That price is even less than the price of the mix of tariffs of CEEE which is US$ 32.33.

The plant will use natural gas imported from Argentina.

This fact ends three paradigms in the Brazilian electrical sector: the use of private capital, the use of other fuel different from water to generate electric power, and the possibility to reduce the price in generation.

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