

# **The Importance of Funds to the Improvement of Public Electric Services**

**Martha B. Romero Magalhães**

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# 1. Introduction

The implementation of government programs through Funds from the national electric energy sector was an achievement obtained by the first regulatory model implemented in Brazil during the first half of the 20th century, in the beginning of the 1930's.

Almost 30 years later, the government-owned company that would become the holding of the Brazilian Electric Energy Sector is funded, promoting operational actions, planning energy production, as well as implementing government programs in the sector, relevant to the development of the country. That's how Sector Funds, essential to the growth of the electric energy sector, originated.

However, the elements essential to the structuring of utility companies in the electric energy industry were created in the 1930's. The concept adopted stated that the public sphere was responsible for creating measures to serve the different needs of social reproduction, at all levels. It deals with the need to serve capital reproduction in sectors that, if left to their own logic, maybe wouldn't be able to do it.

Chapter 2 of this work talks about how the country left a private model, which started in the 19th century, to a model that is under the leadership of the State, implemented after 1934, and the creation of Eletrobrás, a company that manages the Brazilian Sector Funds in the electric energy sector.

Chapter 3 explores three of the main funds managed by the state-owned company.

Chapter 4 presents considerations about the use of electric energy, highlighting the importance of the efficient use of energy and the universalization of access to it.

The programs financed by the Funds presented in Chapter 3 are described in Chapters 5 and 6, with a focus on the topics of values applied and results obtained.

At the end, the most important conclusions are described, as a consequence of the content analyzed.

## 2. Introduction of the Role of the State in the Electric Sector

The Brazilian constitution from 1891 gave great powers to the States and Municipalities. Since then they have defined the rules that guide the first businesses in electric energy generation. Two Canadian companies were the founders based in this industry, one in São Paulo in 1899, and another in Rio de Janeiro in 1904. Later on, in 1912, they became Light and Power Co. Ltda and controlled the two largest markets in Brazil by being in charge of large scale projects at that time.

The contracts signed, in that time, found in the so-called “Golden Clause” the solution to the matter of rates increase, which should be profitable enough to allow for external financial burden and issue dividends. This clause stated that half of the rates charged should be readjusted by the variation of the price of gold.

In 1927, AMFORP – American & Foreign Power came to Brazil. It was the international branch of the North-American Electric Bond & Share Corporation. The company’s strategy was focused on the countryside of the state of São Paulo and on capital cities from the Northeast to the South of the country, once Light already controlled the market in Rio and São Paulo.

The national electric energy industry, which until 1930 counted with these three companies, developed in an isolated manner, with independent systems and based on hydroelectricity. This profile would characterize the country during the following decades. At that time there were no rules to what regards the use of existing hydrology, and the prices increased through contracts that were defined at each concession established.

The 1930’s marked the Federal Government’s intervention in the national electric sector. The great highlight of this intervention was the *Código de Águas* (Code of Waters), in July 1934. This Code was responsible for important institutional changes that aimed at the regulation and control of activities of private, national or foreign concessionaires.

The Code reflected the desire of that time, which was for the State to act as controlling agent of the electric energy industry – which was a global tendency.

The experience of regulation established during the last years of a phase previous to *Código de Águas*, together with a sophisticated study of the United States regulation were the elements that gave Brazil a theoretical and institutional structure capable of opposing parameters and controls to the economic power that prevailed in the contractual regulations phase prior to 1930.

The great depression going on in the United States left, in 1932, 18 million people unemployed out of a total of 40 million workers. The experiences implemented in this country echoed in Brazil and they carried with them the challenge of decreasing the unemployment rate, a reason for disturbance in the capitalist world.

On the other hand, the international experiences showed that the national States had taken for themselves the task of supplying the input that, according to Roosevelt's words, is "as essential to our civilization as light and heat from the sun". According to Ricardo Maranhão's studies, the president of the United States "always preached caution when facing the great private monopolies". The laws approved by Roosevelt in the 1930's determined exactly where electricity, gas, phone, and water companies should report the accounts. There was a cap for prices and profits; it was necessary to have all the insignificant assets accounted for and the lights were never off: no blackout would serve as blackmail to increase prices.

The safety measures taken, not aiming at capitalist profits other than the fair remuneration of the invested capital, were leading to even lower rates. The comparisons with the rates practiced by capitalist companies, within the United States or Canada, with those practiced by public concessionaires, as the Association of Municipalities of Ontario, in Canada, clearly showed the advantages of the "public utility" service (or public utilities) format.

According to Valadão, 1980, p29, it was a return to the concept of "public utility services" that was emerging in 1876, with the vote of the Supreme Court's president – 'Chief Justice' Waite – reported below, that confirmed the sentence from the Superior Court from the State of Illinois against the private silo's warehousing company, *Munn & Scott*.

*"Any given property becomes of public interest when used in such a way that it becomes of public interest and affects collective interests. Therefore, when someone puts their property to such a use they are associating the public to it, having to, therefore, submit it to public control for the common good, proportionately to the interest created".*

*(United States of America – 1876) note 37*

Note 37. Valladao 1980, p 29, that's how the sentence went 'Munn VS Illinois, 94 U.S. 113': "Agreements had been made and everything was ready for the regulation of the public utility services. The principle in itself hasn't been questioned since then."

According to Sauer, 2000, the social constitution of rights was evolving, expanding the anti-market criteria to assure, even more, that the "rights inherent to the human being" were taken to different concrete levels in terms of access to services such as electric energy, natural gas, sanitation (water, sewage, garbage), mobility, public transportation, telecommunications and information highways, in addition to health, education and culture, safety, environmental health. They are and should be assured

to all individuals as a condition to the exercise of citizenship, notwithstanding their social or economic situation or condition” nota 38

Nota 38 II from Sauer. *Os serviços públicos e a autonomia municipal*. (Public services and the autonomy of the municipality) Paper. São Paulo: Instituto Florestan Fernandes, 2000

That was how , according to Vieira, pg 50, Antivalor, 2005, energy services took on a role of anti-merchandise due to their (i) intrinsic dimension (prices, quality, sufficiency, continuity, environmental impacts); (ii) industrial (investments – equipment / civil construction), generation of jobs, income generation, technologies of end use) and (iii) systemic (regional integration, feasibility of productive chains, comparative advantages, social inclusion, fomentation of science and technology).

It is, therefore, in this context, that in July 1934, the *Código Nacional de Águas*, was established by Decree 24.643, becoming the main regulatory milestone of the Brazilian national electric sector. In general lines, the Code established: the separation of the right of land property and the existing hydric resources on its surface that would be explored under concession – for periods of 30 years – and the inspection of the public authorities. In that way, waterfalls and other hydraulic sources of energy were defined as not being a part of the lands and incorporated to national heritage. The industrial use of these falls and sources started to be made by concessions given only to national companies or companies registered in Brazil which, on their turn, would be under the Federal Government’s inspection.

*Código de Águas* (Code of Waters) was the first legal document to treat Electric Energy as a public service. Since then this service has been incorporated to all constitutions of the country after 1934.

As reference to the remuneration of the concessionaires, the Golden clause that assured that half of amount of the rate should be readjusted according to the variation of the price of gold was revoked in 1933. Since then, the remuneration of the services has been based on the capital of the companies and evaluated according to the historic cost for the fixation of the rates. Public services concessionaires have been inspected in technical, financial and accounting terms, to consider the reasonable services rates and the economic-financial equilibrium of the companies.

However, the big private interests tried to claim the unconstitutionality of the Code and spread the word that the Code weakened the development of the electric sector and harmed installed capacity increase, due to the inhibition of investments. In practice, despite difficulties, reality was a little different: this capacity doubled during the period between the enactment of the *Código das Águas* and the year 1951.

The disputes between the concessionaires and the granting power were a milestone in the scenario of the industry. They originated mainly from the profit limitations to which the companies started to have to submit, and inspection rules established.

In 1945, when the country was already undergoing problems of energy supply, Chesf was created to provide energy in an inexpensive way to the Northeast region and to overcome poverty and the underdevelopment of that area. Later, in 1955, when there were still difficulties to create a company at a national level for the electric sector, Furnas was founded.

Eletrobras was only founded in 1962.

## 2.1. The creation of Eletrobrás and the Management of Sector Funds

Centrais Elétricas Brasileiras S.A. (Eletrobrás), a mixed capital company, controlled by the Federal Government, was the result of a presidential proposal from 1954. The purpose of the project from the president at the time, Getúlio Vargas, was to create a great government-owned company, capable of providing electricity to the different regions of the country, especially those where the service was not yet being offered. This project faced strong opposition from different interests, internal to the country as well as external, being approved only seven years later. On April 25, 1961, president Jânio Quadros signed Law 3.890-A which authorized the constitution of the company by the Federal Government. Its operations were to start in June 1962 (Leite, 2007). The company's attributions can be summarized by the following functions (Leite, 2007):

- (i) holding; (ii) financing the expansion; (iii) perform the sectorial programs; (iv) interconnected electric systems operations; (v) national electric system planning.

The function of financing the expansion is related to the fact that Sector Funds (one of the important financing sources of the sector) were administered by Eletrobrás, in addition to most of the resources from the subsidiaries held by the holding. Eletrobrás distributed the resources to the other companies of the sector and their subsidiaries like it was a bank. Among the sector resources managed by Eletrobrás, the following (extinct) could be found: *Imposto Único sobre Energia Elétrica (IUEE)* – Single Tax on Electric Energy and Compulsory Loans. In addition to them, the following still existing Sector Funds are also sources of financing administered by Eletrobrás: The Global Reversion Reserve – RGR and The Energy Development

Account - CDE. Other charges from the sector are also under Eletrobrás responsibility, such as The Fuel Consumption Account - CCC.

It is important to point out that the objective of the CCC is not the financing of the expansion, but the equalization of thermal sources costs at national level, being altered at a later stage for the service of isolated systems.

The function of Sector Programs agent, that is, the function of applying electric energy policies, has been delegated to Eletrobrás considering the dimension of the group in the country and its aggregating role. This function was created for the generation of sector developments with the agents at a national level, as well as to promote energy exchange with neighbor countries whenever possible.

Electric energy conservation, another topic of interest, was taken care of with the creation of a specific program. PROCEL, the National Electrical Energy Conservation Program is one of the main initiatives for energy efficiency and conservation in the country. Created in 1985, the program has, since then, shown savings of 28.5 billion kWh (especially after the creation of Selo Procel - Procel seal), what would be equivalent to approximately the generation of two power plants from Rio Madeira in one year (PROCEL, 2007). The role of energy efficiency is exactly this: allow energy savings by the demand side and eliminate the great need for capacity investment by the supply side.

Eletrobrás previously mentioned functions were an integral part of the constitution of the group and its identity as an agent. Some of these functions were transferred to other agents after the successive reforms in the national electric energy sector during the 1990's, and after the establishment of the New Model for the sector initiated in 2003. This allowed for changes promoted by the new conceptions of the sector.

Therefore, with the functions of this sector's operations and planning not being performed by the Eletrobrás any longer, and stronger financing from BNDES, the company kept performing the role of holding, government programs agent, and manager of the current Sector Funds: RGR, CDE and CCC. They gather resources for the following programs: *PROCEL*; *LUZ PARA TODOS*; *PROINFA*; *RELUZ*.



### 3. Sector Funds

The conception and operational perspectives of Sector Funds took into consideration the main bottlenecks identified in the national electric system:

- a) Investments in the infrastructure of the network  
Improvement and expansion of the Electric System of Concessionaires and Licensees as well as the Rural Electrification Cooperatives of the country, through specific projects aiming at the generation, transmission and sub-transmission and electric energy distribution;
- b) Universalization of access to electric energy  
Brazil is a country with a vast territory and regions of low economic development with a population with no access to electric energy. The objective of the Program *Luz Para Todos* is to make light available to everyone in the country;
- c) Incentive to alternative sources of energy  
The resources are aimed at the development of initiatives based on alternative sources, and at the establishment of a national industry associated to this modality of energy source;
- d) Program of Energy Efficiency in Public Buildings – PROCEL. The objective of this program is to support initiatives aimed at the efficient use of electric energy.

There was the need to establish:

- a) A long term financing pattern, with stable and diversified sources to decrease regional differences and to strengthen the electric sector infrastructure, and
- b) Prioritize and focus in critical areas that are potentially strategic for the country.

In this scenario, the following Sector Funds, among others, have been created:

The Fuel Consumption Account – CCC;  
The Energy Development Account – CDE; and  
The Global Reversion Reserve – RGR.

This work will provide general information about the CCC and CDE Funds, going into more details about the RGR Fund and two of its lines of credit:

- (i) The efficient use of electric energy in Brazil and

- (ii) The universalization of access to electric energy

### 3.1. The Fuel Consumption Account - CCC

<b>Document(s) related to the Fund's Inception and Administration:</b> <ul style="list-style-type: none"><li>- Decrees 73.102/1973, 774/1993, 7.246/2010</li><li>- Ordinances 360/1977, 179/1991, 328/1991</li><li>- Resolutions 245/1999, 427/2011</li><li>- Laws 5.899/1973, 8.631/1993, 9.648/1998, 12.111/2009</li></ul>
<b>Objective:</b> Annual quotas to provide resources for the partial reimbursement of the costs related to fuel utilization for the generation of electric energy for isolated systems
<b>Legal Administrator:</b> Centrais Elétricas Brasileiras S.A. – Eletrobrás – Law 5899/1973.
<b>Operacional Aspects:</b> Centrais Elétricas Brasileiras S.A. – Eletrobrás – Law 5899/1973.

The CCC Fund was created in the 1970's with the initial purpose of costs apportionment related to fuel consumption for the generation of thermoelectric energy in the National Interconnected System – SIN, especially in the North region of the country, including the Isolated Systems from 1992 onwards. Although it was initially created to cover part of fuel acquisition costs, it also started to consider, from 1998 onwards, the coverage with the ventures subrogated - SB <sup>1</sup> to the Fund, seeking economic quality and the replacement of oil derivatives.

CCC revenue originates from the levying of quotas by distributors, licensees and transmission companies of the entire country, in a proportion and amount determined by the Brazilian Electricity Regulatory Agency (Aneel).

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<sup>1</sup> After Resolution 245/1999, Aneel extended the CCC Sector Fund benefit to entrepreneurs that invested (\$) in projects to reduce the consumption of oil derivatives and brought some sort of savings to the Fund.

Its procedures are as follows:

Somewhere in the North Region (energy generated based on diesel oil) an entrepreneur, dully authorized by Aneel, builds, with his own resources, a PCH (Small Hydroelectric Plant), and starts to provide energy to the local distributor. With that, the distributor deactivates the thermal plant reducing the consumption of diesel oil. Aneel audits the costs of the PCH construction and approves that the reimbursement should be of X%, according to specific rules.

During the month that follows the beginning of the plant's commercial operation (month the PCH starts supplying to the distributor), Eletrobrás starts to send monthly reimbursements based on the energy that is being generated and the cost of the fuel replaced, until the amount determined by Aneel is reached.

Besides the PCHs, other forms of SB are: transmission lines, equipment efficacy and generation of alternative sources (biomass, eolic, etc).

In July 2009, the provisional measure 466/2009 was edited, originating Law 12.111/2009, regulated by Decree 7.246/2010, that talks about electric energy services in isolated systems and that altered many legal measures related to the CCC Sector Fund. In general lines, the law determines that the CCC Sector Fund, that already reimburses part of the costs with fuel, is to start reimbursing part of the costs of energy generation. It's important to highlight that after Law 12.111/2009, there is no deadline for the closing of the CCC Sector Fund.

The total cost of electric energy generation, to serve the Isolated Systems, includes the costs related to the price of energy and the associated power contracted by the distribution agents, the agents' own generation, including machinery rent, energy imports and associated power, including the cost for the respective transmission. Taxes and charges not recovered are also included, as well as the investments made in self generation, the price of the service for electric energy generation in remote areas, including installation, operation, and maintenance of decentralized generating systems with associated networks and, also, the hiring of capacity reserve to assure the safety of the electric energy supply.

CCC will reimburse, out of the total cost, the difference related to the average cost of the power and energy commercialized in the Regulating Contracting Environment (ACR) of the National Interconnection System (SIN).

In 2010, the fund only covered part of the costs with fuels and subrogated ventures, since the standardizing of the law has not been concluded by Aneel. And for that, about US\$ 2,3 billion have been levied, through monthly quotas from distributors, transmission companies and licensees. This amount, plus US\$ 78 million originating from fines, installments, investments and others has allowed for a pass on of about US\$ 2,2 billion, out of which US\$ 72 million are for subrogations and the rest for the fuels.

The difference between the amount levied and the amount reimbursed was directed to a reserve account, as determined by Aneel, to start a fund for the payment of the differences owned from the implementation of Law 12.111/2009.

### 3.2. The Energy Development Account - CDE

<b>Document(s) related to the Fund's Inception and Administration:</b>
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|---|
| - Decree 4.541/2002<br>- Laws 10.438/2002, 10.762/2003, 10.848/2004 |
|---|

<b>Objective:</b> Annual quotas to provide resources to promote electric energy development and the competitiveness of generated energy coming from sources such as eolic, biomass and small hydroelectric Plants (PCH), as well as expand the natural gas network, aside from national mineral coal. It also promotes the
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universalization of the electric energy service all over the country.
<b>Legal Administrator:</b> Centrais Elétricas Brasileiras S.A. – Eletrobrás – Law 10.438/2002.
<b>Operacional Aspects:</b> Centrais Elétricas Brasileiras S.A. – Eletrobrás – Law 10.438/2002

CDE (The Energy Development Account) was created by Law 10.438/2002, has a lifespan of 25 years and is managed by Eletrobrás, following procedures determined by the Ministry of Mines and Energy (MME), with the objective of promoting the energy development of the states and the competitiveness of the energy produced from small hydroelectric plants, biomass and eolic sources, from the expansion of the natural gas network serving the states that still do not have a pipeline, and from national mineral coal in areas served by the interconnected systems. CDE also promotes the universalization of the electric energy service in all national territory.

CDE resources originate from the payment of annual quotas made by all agents that commercialize electric energy to the end consumer, and from fines imposed by Aneel. The CDE also receives annual quotas originated from hydroelectric plants, for the Use of Public Property (Uso de Bem Público – UBP).

To compensate the electric energy concessionaires for the decrease in revenue from the service rendered to consumers from the Low Income residential subclass, the economic subsidy was created with resources from the Energy Development Account (CDE). In 2010, US\$ 1,950 million were released, as subsidy, out of which US\$ 1,008 million were for the Low Income, helping many electric energy distribution concessionaires, and US\$ 942 thousands for the program *Luz para Todos*.

The CDE Account Transactions for 2010 are shown below:

**Inflows and Investments in 2010: US\$ million**

**Transactions**

**Inflows: CDE+UBP+Aneel Fines: 2,388**

Levy of quotas 1,878

Others 510

**Investments: 2,310**

*Luz para Todos* Subsidy 942

Low Income Subsidy 1,008

Others 360

Exchange rate in 12/31/2010: US\$ 1,6654

Currently, five mineral coal thermoelectric plants are included in the CDE: *Charqueadas* and *Jorge Lacerda*, both belonging to Tractebel, *São Jerônimo* and *Presidente Médici* (Eletrobrás CGTEE), and *Figueira* (Copel).

For the 2012 fiscal year, Aneel has ratified the destination of US\$ 2,3 billion for the financing of CDE. The Agency has fixed the amount of US\$ 1,1 billion for the agents' annual quota.

### 3.3. The Global Reversion Reserve - RGR

<p><b>Document(s) related to the Fund's Inception and Administration:</b></p> <ul style="list-style-type: none"> <li>- Decrees 41019, 774, 4541, from 02/26/1957, 03/18/1993 and 12/23/2002, respectively.</li> <li>- Laws 5655/1971, 8631/1993, 9427/1996, 9648/1998, 10438/2002, 10848/2004 and 12431/2011, from 05/20/1971, 03/04/1993, 12/26/1996, 05/28/1998, 04/26/2002, 03/15/2004, 06/24/2011, respectively.</li> </ul>
<p><b>Objective:</b> annual quotas from the reversion to provide resources for reversion, termination, expansion and the improvement of electric energy public services.</p>
<p><b>Legal Administrator:</b> Centrais Elétricas Brasileiras S.A. – Eletrobrás – Law 5655/1971.</p>
<p><b>Operational Aspects:</b> Centrais Elétricas Brasileiras S.A. – Eletrobrás – Law 5655/1971.</p>

RGR has been established based on the terms of Article 33 from Decree nº 41.019, from 02/26/1957, with the objective of creating a fund to cover the costs of the Federal Government with indemnities of eventual concession reversions linked to the electric energy public service.

Law nº 5.655, from 05/20/1971, with later amendments from Laws 8.631, 10.438 and 10.848, from 03/04/1993, 04/26/2002 and 03/15/2004, respectively, established the reckoning of these annual quotas as part of service costs of concessionaires / licensees, as a reiteration to the objective of providing resources for the termination, expansion and improvement of electric energy public services, allowing for, however, the possibility of new uses.

At a later stage, Law nº 12.431, from 06/24/2011, originating from the Provisional Measure 517/2010, from 12/30/2010, extended the levy and the employment of the RGR Fund until 2035.

#### 3.3.1. Levy

This Fund is constituted by quotas charged to concessionaires (Distributors, Generating and Transmission Companies and Electric Energy Licensed Cooperatives), levied on the 15th day of the month that follows the month of

reference, reversion of interests, installments of debts, refunds of granted financing and return on financial investments.

### 3.3.2. Investments

The main clause of Article 4 of Law nº 5.655/1971 states the following: “... *with the objective of providing resources for the reversion, termination, expansion and improvement of electric energy public services.*”

On paragraph 4 of the same Law, with the writing given by Law nº 10.438/2002, it is stated that Eletrobrás is allowed to, if authorized by its Administrative Council and while in compliance with Article 13 of Law nº 9.427, from 12/26/1996, assign RGR resources to the:

- Reversion, termination, expansion and improvement of electric energy public services;
- Expansion of electric energy distribution;
- Financing of production plants from eolic, solar and biomass sources as well as small electric plants;
- Studies of inventory and viability of hydraulic potential improvement, by means of a 3% allocation to the MME;
- Implementation of electricity generating plants of up to 5.000 kW;
- Development of programs and projects aiming at the fight against the waste and efficient utilization of electric energy;
- Conclusion of the works already started on thermonuclear generation;
- Fomentation of equipment utilization, of collective and individual use, intended to the conversion of solar energy into electric energy;
- Rural Electrification Programs, including those partially subsidized;

It is important to point out a legal restriction of a 50% minimum investment from the total resources raised, effective with Law nº 9.427/1996, for investments in the Electric Sector of the North, Northeast and Middle West Regions.

Eletrobrás, as the investment manager of the resources originated from the RGR, invested during the fiscal year of 2010 the amount of US\$ 630 million. The statement concerning the inflows and the investments of these resources is shown below:

**Inflows and investments of 2010 In US\$ million****Statement**

<b>Inflows:</b>	<b>1,877</b>	
Levy from quotas	955	
Others	922	
<b>Investments:</b>	<b>630</b>	
Financing	630	
<b>Region</b>	<b>Financing released - %</b>	
	<b>US\$ million</b>	
North	192	30.5
Northeast	100	15.8
Middle West	83	13.2
South	149	23.6
Southeast	106	16.9
<b>TOTAL</b>	<b>630</b>	<b>100.0</b>

Exchange rate in 12/31/2010: US\$ 1,6654

RGR resources are used in, among others, social projects for the universalization of electric energy services (*Luz para Todos*) and in the National Electrical Energy Conservation Program – PROCEL.

Among the uses of this resource, the topics *Development of programs and projects aiming at the fight against the waste and efficient utilization of electric energy* and *Rural Electrification Programs* have been chosen to be presented within this paper.

## 4. Electric Energy Utilization

Among the many forms of energy, some, particularly interesting, are those that are processed by society and made available to consumers where and when necessary, such as electricity, gasoline, alcohol, diesel, natural gas, etc.

Energy is used in simple appliances (lamp bulbs and electric engines) or in more complex systems that encompass other equipment (refrigerators, vehicles, or a factory).

These equipment and systems transform the forms of energy. Part of it is always lost to the environment during this process. For example: a lamp bulb transforms electricity in light and heat. As the objective of a lamp bulb is to produce light, a measure of its efficiency is obtained by dividing the energy of the light by the electric energy used by the lamp bulb.

In the same manner the efficiency of a car can be evaluated by dividing the amount of energy the car can produce with its dislocation by that originally contained in the gasoline.

Another source of waste comes from the inadequate use of appliances and systems. A lamp bulb on in an unoccupied room is a waste as the light is not serving its purpose.

A car stuck in traffic jam is also consuming more energy than that needed because of the time it is motionless.

Other more subtle factors explain many forms of waste. A builder can charge less for his work by not isolating the boiler and the hot water pipes, but the one paying for the waste will be the consumer.

It is worth mentioning that these effects multiply as energy migrates throughout all sectors of economy.

Considering that a regular incandescent lamp has an 8% efficiency (that is, 8% of the electric energy used is transformed in light and the rest heats the environment). The efficiency of a compact fluorescent lamp, that produces the same light, is about 32%.

As the price of the efficient lamp is 10 to 20 times higher than the regular one, the decision of which to buy will depend on economic factors that consider the life span of each one and how much can actually be saved in the electricity bill.

The calculations needed to make the decision above are not simple. They require control of financial math skills not common to most consumers.



The selection of more complex equipment and systems can be even harder. This is why many consumers use all forms of energy inadequately.

With that in mind, it is important to think about energy waste and consider alternatives for efficient use. These actions are an answer to a strong global concern with the future scarcity of the planet's natural resources and the impact originating from energy generation.

As previously mentioned, RGR resources finance energy efficiency that deals with the issues above. The following will be considered in this work:

- National Program for Efficient Public Lighting - *Programa Nacional de Iluminação Pública Eficiente* – Procel Reluz;
- Program for Efficiency in Environmental Sanitation - *Programa de Eficiência em Saneamento Ambiental* – Procel Sanear;
- Program of Energy Efficiency in Public Buildings - *Programa de Eficiência Energética em Prédios Públicos* – Procel EPP.

In addition to the above initiatives related to PROCEL, this work will also talk about the program *LUZ PARA TODOS*, aimed at the universalization of access to electric energy.

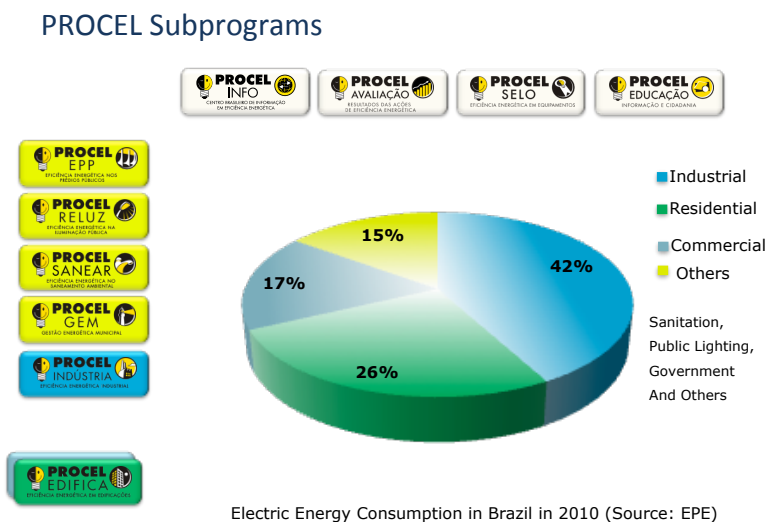
## 5. Energy Efficiency

The saving of electric energy can bring countless advantages, such as postponing the building of new generating power plants and associated systems, freeing resources for other areas and contributing to the preservation of the environment.

The strategic mission of Procel - The National Electrical Energy Conservation Program is to mobilize society for the efficient use of electric energy, fighting forms of waste. The Technology board of directors from Eletrobrás is responsible for the Executive Secretariat of the program, which was created in 1985 by the Federal Government through the Ministry of Mines and Energy. Eletrobrás is also responsible for enforcing the program. To do so, the company uses its own resources, as well as resources from RGR and from international entities.

With this purpose, Eletrobrás has interacted with agents working on partnerships to develop projects that support and point to energy efficiency in the different sectors of the country's economy.

Procel has the following subprograms:



- Procel Evaluation - Results of Energy Efficiency Actions (*Procel Avaliação - Resultados das Ações de Eficiência Energética*);
- Procel Building - Energy Efficiency in Buildings (*Procel Edifica - Eficiência Energética em Edificações*);
- Procel Education - Information & Citizenship (*Procel Educação - Informação e Cidadania*);

- Procel EPP - Energy Efficiency in Public Buildings (*Procel Eficiência - Energética nos Prédios Públicos*)
- Procel GEM - City Electricity Management (*Procel GEM - Gestão Energética Municipal*);
- Procel Industry - Industrial Energy Efficiency (*Procel Indústria - Eficiência Energética Industrial*)
- Procel Info - Brazilian Center for Information on Energy Efficiency (*Procel Info - Centro Brasileiro de Informação de Eficiência Energética*);
- Procel Marketing - Conscientization & Information (*Procel Marketing - Conscientização e Informação*);
- Procel Reluz - Energy Efficiency in Public Lighting (*Procel Reluz - Eficiência Energética na Iluminação Pública*);
- Procel Sanitation - Energy Efficiency in Environmental Sanitation (*Procel Sanear - Eficiência Energética no Saneamento Ambiental*);
- Procel Label – Energy Efficiency in Equipment (*Procel Selo - Eficiência Energética em Equipamentos*);

One of the main initiatives identified to reach PROCEL's objectives was the dissemination of quality information about this subject.

In this context, Eletrobrás/Procel has implemented Procel Info – Brazilian Center for Information on Energy Efficiency. This project is part of the energy efficiency program (Project BRA/01/001) developed with resources donated by the Global Environment Facility (GEF) to the Brazilian Government, through the World Bank - BIRD, with the support of the United Nations Development Program (UNDP).

### **Procel Info**

The Brazilian Center for Energy Efficiency Information - Procel Info - has as its main objectives:

#### Objectives

- Develop and maintain a dynamic knowledge base about energy efficiency, established on information originating in Brazil and abroad (according to the defined area of scope) and to disseminate it to those interested in the subject;
- Facilitate the integration and cooperation among the agents that act in the energy efficiency area; be them from Brazil or from other countries.

#### Mission

Contribute to social, economic and technological development, as well as to the environmental preservation of the country, spreading high quality information about the rational and efficient use of energy, and facilitating the integration of the agents that act in this area.

#### Vision

To be recognized as a national reference in the dissemination of high quality information about the rational and efficient use of energy.

## Structure

Procel Info's structure is based on three pillars: content management, market relations and information technology. Its team is multidisciplinary and composed of specialized professionals. This organization has been carefully planned to create an environment of permanent synergy among its areas, assuring the quality of products and services offered by the Center.

The main product of the Center is the Procel Info Portal, where those interested in the subject of energy efficiency have access to the knowledge base developed and to a safe exchange and integration environment, allowed by collaborative tools.

In this Portal selected content produced by experts is made available. To facilitate browsing, this material is presented in an organized and structured way by type of information.

The portal, in addition to promoting the energy efficiency theme, also promotes the actions performed by the program. In 2011, the Procel portal registered more than 450 thousand clicks.

## **The Procel Seal**

Created in 1993, the Eletrobrás Energy Saving Procel Seal highlights to consumers the most efficient household electrical appliances and equipment in each category. The concession of the seal is a consequence of a partnership between Eletrobrás Procel and The Brazilian Labeling Program (PBE), from Inmetro. In 2011, the seal was given to 3,784 models from 209 different companies, distributed in 32 categories of equipment and household electrical appliances.

It can be estimated that almost the entirety of energy results Procel has achieved originate from the seal. Following other countries examples (e.g. The U.S. with the Energy Star), the Procel Seal of Energy Saving is a marketing tool, a "certificate" with the purpose of pointing to the consumer, at a time of purchase, the electric appliances (mainly household appliances) with the best levels of energy efficiency within each category.

The Procel Seal is a volunteer program, in which manufactures participate through their respective trade associations. At present, the program involves 206 manufactures, seven associations and more than 20 labs. Currently the seal is given to 3,778 appliances, of 31 categories; a number that increases every year. In 2010, more than 50 million appliances with the Procel Seal were sold.



Energia (Elétrica)		REFRIGERADOR
Fabricante	ABCDEF	
Marca	XYZ(Logo)	
Tipo de degelo	ABCAutomática	
Modelo/tensão (V)	IPQR/220V	
Mais eficiente	A	A
	B	
	C	
	D	
Menos eficiente	E	
CONSUMO DE ENERGIA (kWh/mês) (calculado no teste ciclo técnico)		XY,Z
Volumes: compartimento refrigerado ( l )		000
compartimento do congelador ( l )		000
total do refrigerador ( l )		000
Temperatura do congelador (°C)		-18
<small>Regulamento Específico Para Uso de Etiqueta Nacional de Conservação de Energia            Lista de Refrigeradores e suas Características - RCD 2010-REP            Instruções de instalação e recomendações de uso, veja o Manual do usuário.</small>		
<small>IMPORTANTE: A REMOÇÃO DESTA ETIQUETA ANTES DA VENDA ESTÁ EM DESACORDO COM O CÓDIGO DE DEFESA DO CONSUMIDOR</small>		

It is reasonable to say that the critical success factor of this program is the recognition of the Seal's image and conception by the society, what increases the sales of products with the seal and strengthens the image of the entities involved as well, such as Eletrobrás, MME (Ministry of Mines and Energy) and manufactures.

Since 1993, the program promotes the National Award for Conservation and Rational Use of Energy, known as Procel Award, that recognizes the effort and results obtained by the agents acting against energy waste. The objective of the Procel Award, given annually, is to stimulate the implementation of actions that can effectively reduce electric energy consumption.

### Procel Reluz, Procel Sanear e Procel EPP

The development of energy efficiency in the public electric sector is fostered by previously mentioned government programs *Procel Reluz*, *Procel Sanear* and *Procel EPP*. Eletrobrás has been engaged in the financing of projects aiming economy and pursuing the goal of energy efficiency in these sectors.

Below there is a brief explanation of each of these three government programs as a demonstration of the efforts that have been made in this area, as the use of financing with resources from the RGR Fund.

## 5.1. National Program for Efficient Public Lighting (Reluz)

The Procel Reluz Program, of national scope, consists of the implementation of energy efficiency projects in the public lighting and traffic lights systems, by the replacement of incandescent, blended and mercury vapor lamps, by high pressure sodium vapor and metal vapor lamps, which are more efficient. In traffic lights systems, the incandescent lights are replaced by systems that use light emitting diodes (LEDs), with a longer lifecycle and a 90% lower energy consumption level.

The program has served ten districts in 2010, making 89.559 traffic light spots more efficient, what resulted in energy savings of 29.9 thousand MWh/year and a reduction

in demand of 6.8 thousand kWh. This result was possible due to investments that sum up to US\$ 19,9 million, being Eletrobrás responsible for US\$ 14,9 million.

It is also possible to highlight an increase of 74% in the financial value of Procel Reluz projects portfolio between the end of the 2009 fiscal year and the same period in 2010, going from approximately US\$ 133,9 million to US\$ 388,3 million.

The total of financial resources, including RGR resources, made available in 2010 considering what had been accomplished in previous years, was of US\$ 27,2 million for projects from Procel Reluz, representing an increase of 62.5% in relation to the same period in 2009.

Since the beginning of the program more than 2.34 million light spots have been implemented with a total investment of approximately US\$ 306 million. The total amount of energy saved is of 827 thousand MWh/year, with a reduction of 190.8 thousand kWh of demand during the peak time of the electric system.

Below is the use of resources invested by region in the Reluz Program, during 2010:

<b>Region</b>	<b>Middle West</b>	<b>North</b>	<b>Northeast</b>	<b>South</b>	<b>Southeast</b>	<b>TOTAL</b>
<b>Resources US\$ million</b>	1,673	-	1,058	4,969	12,176	<b>19,876</b>

In 2010, Procel developed projects that contribute to saving approximately 6.16 million KWh of energy. This result is equivalent to the annual consumption of electric energy of approximately 3.3 million homes, saving an investment of US\$ 418 million in the expansion of electric energy generation.

Created in 1993, The Procel Energy Economy Seal indicates to the consumer, at the time of a purchase, which product has the best levels of energy efficiency within each category. The objective is to stimulate the manufacturing and commercialization of more energy efficient products, contributing to the technological development and to the reduction in environmental impact.

Also, since 1993, the program promotes the National Award for Conservation and Rational Use of Energy, known as *Prêmio Procel* (Procel Prize), which acknowledges the efforts made and the results obtained by the agents acting against energy waste. Granted annually, the Procel Prize has as its objective to stimulate society to implement actions that effectively reduce the consumption of electric energy.

## 5.2. Program for Efficiency in Environmental Sanitation – Procel Sanear

Two and a half per cent of total consumption of electric energy in Brazil, the equivalent to approximately 10.4 billion kWh/year (projection based on SNIS - 2007 reference), is used by water and sanitation sewage service providers all over the country.

According to data from the National Information System on Water, Sanitation and Solid Waste – SNIS (*Sistema Nacional de Informações sobre Saneamento*), published annually by the National Secretariat of Environmental Sanitation (SNSA) from the Ministry of Cities, the country loses 40% of the water distributed by the service providers in relation to the water produced (2007 reference). According to technical studies done by the Ministry of Cities, in order to make the water supply and sewage sanitation services available to everyone in the country, serving the population that currently does not have access to these services and absorbing population growth until 2020, investments estimated in US\$ 107 billion would be necessary. It is certain that making sanitation services available to everyone will imply the use of new resources. Among which the sector looks into the use of electric energy with concern, once it is already in the second place in the agenda of operational costs for the majority of sanitation service providers, and for some it is in first.

### Procel Sanear

Eletrobrás has been developing, via Procel, the Program for Efficiency in Environmental Sanitation (Procel Sanear), which acts with the National Program for Water Conservation - (PNCDA) and the Program of Modernization of the Sanitation Sector (PMSS) – both under the coordination of SNSA, linked to the Ministry of the Cities. Other agents worth mentioning are the Electric Energy Research Center (Eletrobrás Cepel), which performs an important role in the technical scope of the program, and The National Health Foundation (Funasa) from the Ministry of Health, which offers support to Brazilian municipalities of up to 50 thousand inhabitants.

Eletrobrás/Procel has been acting in the environmental sanitation area since 1996. After 2002, the number of activities performed by Procel Sanear increased due to the consolidation of strategic partnerships involving, at first, Eletrobrás Cepel, PMSS and PNCDA. Some partnerships are worth mentioning, such as the Technical Cooperation Protocol between the Ministry of Mines and Energy, with the intervention of Eletrobrás, and the Ministry of Cities, via SNSA, signed in September 2004; and the Technical Cooperation Protocol between the Ministry of Mines and Energy, via Eletrobrás, and the Ministry of Health, via Funasa, signed in October 2006. Other partnerships are being implemented to broaden the scope of the program: Assemae (National Association of Municipal Services of Water Supply

and Sanitation), MCT (Ministry of Science and Technology), CAIXA and Sabesp (The Basic Sanitation Company of the State of Sao Paulo).

#### Objectives

The main objectives of *Procel Sanear* are:

- Promote actions that aim at the efficient use of electric energy and water in environmental sanitation systems, including consumers, according to an integrated concept of utilization of these resources;
- Encourage the efficient use of hydric resources, as a strategy to water scarcity in hydroelectric energy;
- Contribute to the universalization of environmental sanitation services, with lower costs to society and additional benefits in the areas of health and environment.

#### Goals

The main goals of Procel Sanear are:

- Advancement of the flow of financial resources for the implementation of energy efficiency projects in the area of environmental sanitation;
- Improvement of the performance indicators associated to electric energy and to water processing by the providers of sanitation services;
- Higher awareness of consumers to what refers to the adequate use of electric energy and water and to the information of new technologies and their benefits.

The companies in this sector interested in getting a financing for the execution of projects related to energy efficiency in sanitation can refer to the Manual Global Reversion Reserve (RGR) Financing Manual, available at Procel's website.

The Financing Instructions Manual, via RGR, presents the criteria and procedures to guide the electric energy concessionaires in the presentation of projects about energy efficiency in water supply and sewage sanitation, within the scope of *Procel Sanear*.

### **5.3. Program of Energy Efficiency in Public Buildings – Procel EPP**

Eletrobrás, through the National Electrical Energy Conservation Program (Procel), in the scope of the Program of Energy Efficiency in Public Buildings - Procel EPP, has contributed with the Federal Government to the social and economic development of the country, performing actions to decrease the demand and consumption of electric systems in public buildings.



The program promotes the conservation of electric energy in public buildings at federal, state and municipal levels, as well as disseminating techniques and methodologies for the replication of projects in the areas of: lighting systems; air-conditioning systems; any other system that promotes a decrease in electric energy consumption and technological innovation in buildings and labs used for studies in energy conservation in buildings.

How it came to be

Procel EPP started actions to promote energy savings in public buildings in 1997, in order to promote energy efficiency in federal, state and municipal units.

In the beginning many diagnoses were made to identify the true energy saving potential in the reduction of consumption and demand of this segment. After that pilot-projects were implemented with large scale replication potential. Other actions were also implemented with the purpose of: awareness, empowerment, dissemination, partnerships with other segments, aside from the laboratory training. It can be estimated that in Brazil, currently, there are approximately 20.000 public buildings under the direct administration of the Federal Government and 500 thousand units if all three levels of government are considered (federal, state and municipal).

In 2010 energy consumption in public buildings was of approximately 12.5 TWh, (source: SAMP-ANEEL). Technical and managerial measures of low investment may reduce costs 15% to 20%, what means, in terms of energy conserved, an economy of 2500 GWh/year.

Goals

Procel EPP's activities aim at:

- Decrease electric energy consumption;
- Empower administrators of Public Buildings;
- Implement demonstration projects in public buildings, registering, measuring, checking and propagating the results; and
- Empower the labs of Public Universities.

An important action is to implement the National Label of Energy Conservation in Public Buildings as a mechanism of evaluation and classification of the impacts caused by energy conservation actions used in the buildings.

PROCEL EPP also collaborates with the Ministry of Mines and Energy in regulatory activities related to the public building sector.

Forms of Acting

The program promotes the conservation of electric energy in public buildings at federal, state and municipal levels, as well as disseminating techniques and methodologies for the replication of projects in the areas of:

- Lighting Systems;
- Air-Conditioning Systems;
- Any other system that promotes a decrease in electric energy consumption and technological innovation in buildings and labs used for studies in energy conservation in buildings;
- Labs used for studies in energy conservation in buildings.

Currently the following software is under development:

- Component for the Registration of Public Buildings and their Administrators;
- Component for Energy Efficiency Projects;
- Component for Project Analysis and Price Bank (Rear).

The software is developed with the following objectives:

- Implement the monitoring, maintenance and updating of public buildings registration;
- Take the information of the registration as a basis to define the short and medium term economy goals, compulsory alteration notification for increase or suppression of equipment in the electric system of the building and a requirement in buying efficient equipment, with the exception of specific use equipment;
- Follow up, checking and registration of the savings obtained and the technical support to the public building administrators in the implementation and follow up of the projects.

O PROCEL EPP allows for, indirectly, other benefits, such as:

- Reduction of expenses related to the consumption of electric energy;
- Creation of new jobs;
- Technological Development.

## 5.4. Results Obtained

The energy savings made possible by the actions performed by Procel allow for an expansion rate reduction of the national electric system, attenuating the need for investments in this sector. These actions also allow for an improvement in the safety system of electric energy supply, as well as a reduction in environmental damage caused by undertakings of energy generation.

In 2010 Procel provided for electric energy savings of 6.16 billion kWh, due to the implementation of energy efficiency measures, according to the detailed as follows. Energy savings obtained in 2010 are 13% higher than that reached in the previous years, overcoming the established goal of 5%.

This result is equivalent to 1.47% of the total energy consumption in Brazil in that period, what corresponds to the energy supplied for one year by a hydroelectric plant with a 1.478 MW1 capacity. This energy would also be enough to serve three million three hundred thousand Brazilian homes for one year, considering that, in average, a Brazilian home's consumption is 153.9 kWh a month, according to EPE – Monthly Overview of the Brazilian Electricity Market, year IV, number 40, from January 2011.

The subprograms that have contributed to these savings in energy were Procel Indústria, Procel Reluz and Procel Selo. The other subprograms did not have their results estimated, as the methodologies to perform such evaluations are still under development.

Below is the summary of the results obtained by the projects and actions implemented by Procel in 2010.

## RESULT

RESULTS	TOTAL
Energy saved (Billions of kWh)	6.164
Demand reduction in one side (MW)	2.425
Power plant equivalent (MW) <sup>3</sup>	1.478
Equivalent CO2 emission avoided	316

Table 1 – Main Energy Results from Procel Actions in 2010

## INDICATOR

INDICATOR	TOTAL
Energy savings in relation to the total electric energy consumption in Brazil in 2010 (%)	1.47
Energy savings in relation to the residential electric energy consumption in Brazil in 2010 (%)	5.75
Number of homes that could be served with energy savings during one year (million)	3.34

Table- Energy Indicators Results from the Actions of Procel in 2010

## INVESTMENT

INVESTMENT	TOTAL
	US\$ million
<b>Eletrobras (EP + FDT)</b>	<b>8,35</b>
<b>RGR</b>	<b>27,21</b>
<b>Infrastructure Financing</b>	<b>10,21</b>
<b>Total</b>	<b>45,77</b>

Table 3 – Main Investments in Procel by Eletrobrás in 2010

EP – Studies and Projects – ordinary financial resources from Eletrobrás

FDT – Technological Development Fund, pursuant to resolution of Eletrobrás Executive Committee, from 1979

In 2011, Procel contributed to electric energy savings estimated at 6.5 thousand GWh (provisional results) with investments of approximately US\$ 16 million in projects and financing of infrastructure and personnel, not including the resources from The Global Reversion Reserve – RGR, already mentioned in the Procel Reluz Program. This result is equivalent to the annual consumption of approximately 3.5 million households, representing a postponed investment in the electric energy sector of more than US\$ 373,31 million. These resources could also be allocated to other projects, such as in social or infrastructure areas.

## 6. National Program for the Universalization of Access Electric Energy Services – Luz Para Todos (LPT)

The objective of the National Program for the Universalization of Access Electric Energy Services (Luz para Todos), established by Decree n° 4.873, from 11/11/2003, and altered by Decrees n° 6.442, from 04/25/2008, n° 7.324, from 11/05/2010, n° 7.520, from 07/08/2011 and n° 7.656, from 12/23/2011, is to provide, until 2014, electric energy to part of the population living in rural areas of the country and who still do not have access to this public service.

In 2011, 247,862 new installations were completed within the program, reaching a total of 2,902,398, what corresponds to more than 14.5 million people benefited in rural areas. To what regards the objectives set for 2011, 78% of the global target was accomplished, 317,854 installations in total, after accounting for the agents' agreements with Eletrobrás and local state governments.

Considering only the agreements with Eletrobrás, 53,191 projects were registered in the management system of the Luz Para Todos Program, reaching a total of 432,635 projects since 2004. This total includes the 2,330,160 installations completed, what corresponds to 88% of the total hired between the agents and Eletrobrás, such as:

- (I) Installations of the electric energy system in rural areas of 5,378 municipalities;
- (II) The construction of 587,139 km of high and low voltage power lines;
- (III) The setting up of 6.1 million lamp posts;
- (IV) The installation of 883,190 transformers; and
- (V) The implementation of 2,078 Photovoltaic systems.

Below is the amount released until 12/31/2011, allocated by region:

Region	Resources released until 12/31/2011 – US\$ million						
	Construction Programs			Special Projects	Total		
	CDE	RGR	CDE+RGR	CDE	CDE	RGR	CDE+RGR
North	1,302.78	143.78	1,446.57	0.66	1,303.44	143.78	1,447.22
Northeast	2,382.16	401.05	2,783.21	0.17	2,382.33	401.05	2,783.38

Midwest	311.89	249.62	561.51	-	311.89	249.62	561.51
Southeast	362.52	472.23	834.75	-	362.52	472.23	834.75
South	140.08	191.28	331.35	-	140.08	191.28	331.35
<b>Brazil</b>	<b>4,499.44</b>	<b>1,457.95</b>	<b>5,957.39</b>	<b>0.83</b>	<b>4,500.27</b>	<b>1,457.95</b>	<b>5,958.22</b>

Below is the number of installations hired to be completed until 12/31/2011, allocated by region:

Region	Number of Installations hired until 12/31/2011 based on agreements between the Agents and Eletrobras		
	Construction Program	Special Projects	Total
North	532,947	297	533,244
Northeast	1,314,321	51	1,314,372
Midwest	198,056	-	198,056
Southeast	422,643	-	422,643
South	180,583	-	180,583
<b>Brazil</b>	<b>2,648,550</b>	<b>348</b>	<b>2,648,898</b>

## 7. Conclusion

The perception of the government that the development of projects related to the improvement of the country's electric energy infrastructure is a prerequisite for industry development in general, as well as for obtaining and maintaining competitiveness between countries, companies and organizations, has taken the State to adopt measures that would allow for favorable conditions to such sectors.

The performance of the State has been proving to be of extreme importance for fostering the expansion of the Brazilian Electrical System, a basic condition for the development of the country. In accordance with this policy, the creation of Sector Funds was vital for companies in the Energy Sector that have started to count on the possibility of financing for the implementation of power generation, transmission and distribution projects, notably in the areas of the country that are mostly in need. In the case of RGR, according to the legislation, the resources are used more intensely in the North, Northeast and Middle West regions of the country.

Sector Funds came to offer alternatives to the problem of lack of resources, by establishing a pattern for long term financing and stimulating private corporate participation.

Eletrobrás, as the administrator of the RGR Fund, created and improved expertise in the RGR administration, especially in the concession and administration of financing contracts, including:

- Standardizing efficient procedures;
- Computerized Systems in Contract Administration;
- Costs reduction and optimization of operational resources utilization;
- Specific Legal Evaluation.

To what regards the use of resources, Eletrobrás, with the approval of its Administrative Council, grants resources to specific investment projects, according to each fund's legislation, through the signing of financing contracts, which follow general and management clauses pre-defined in internal norms, through its Lines of Credit and following the General Conditions of the Financing Contracts of Eletrobrás.

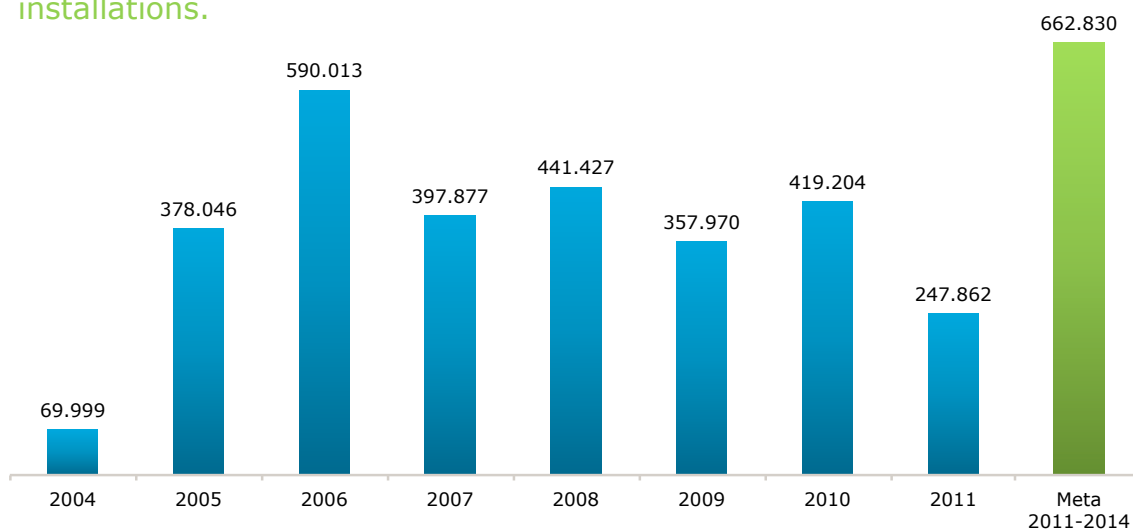
The resources of the Funds administered by Eletrobrás, as presented, are also used to promote a successful policy for the Universalization of Access to Electric Energy and Electric Energy Saving.

Eletrobrás has trained people and specialized in the management, execution and/or inspection of activities related to different current programs. The main results of both programs mentioned above show the success that has been obtained. They are:

- a) Access to energy for more than 14 million people for the last 11 years, serving different segments of the Brazilian population in distant and low income regions. See graphs below:

## Number of Electric Energy Installations

The program benefited 14.1 million people from all regions of the country with 2,902,398 electric energy installations.



Source : MME – Dec/11



## ***Luz Para Todos* - Population served in Brazil**

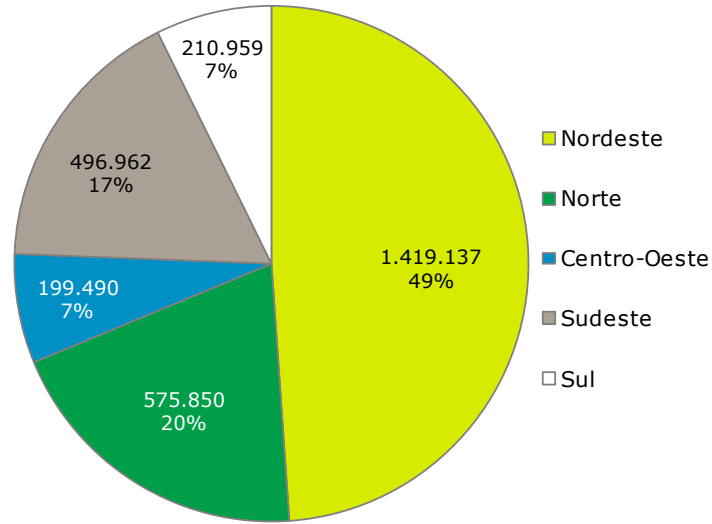
**14.1 million people have benefitted from the program**

<b>Quilombolas:</b>	<b>21,879 installations</b>
<b>Indians:</b>	<b>32,285 installations</b>
<b>Settlements:</b>	<b>220,135 installations</b>
<b>Schools:</b>	<b>12,718 installations</b>
<b>Others:</b>	<b>2,615,381 installations (2.6 million)</b>



Source : Eletrobras RIG and MME - dec/11

## Installations per Region ELB + Gov.+ Utilities

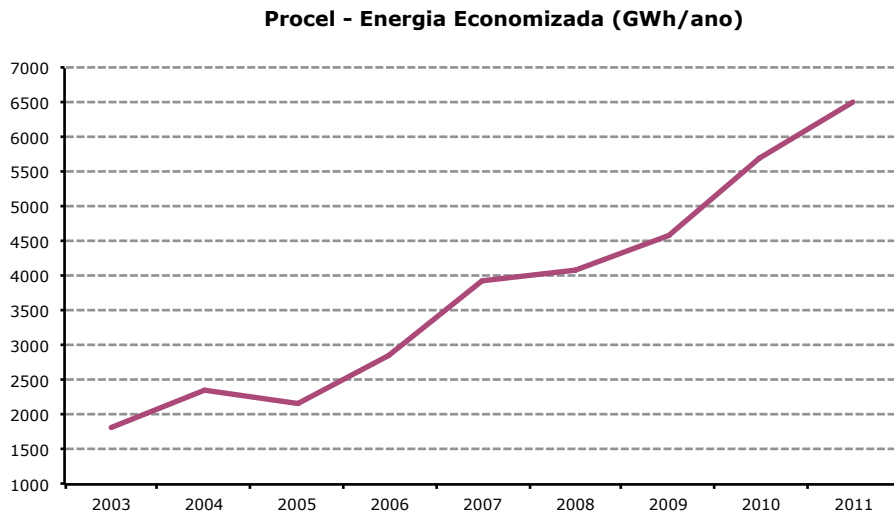


**69% das ligações são no norte e no nordeste**

Northeast  
North  
Midwest  
Southeast  
South

69% of all installations are in the North and Northeast regions

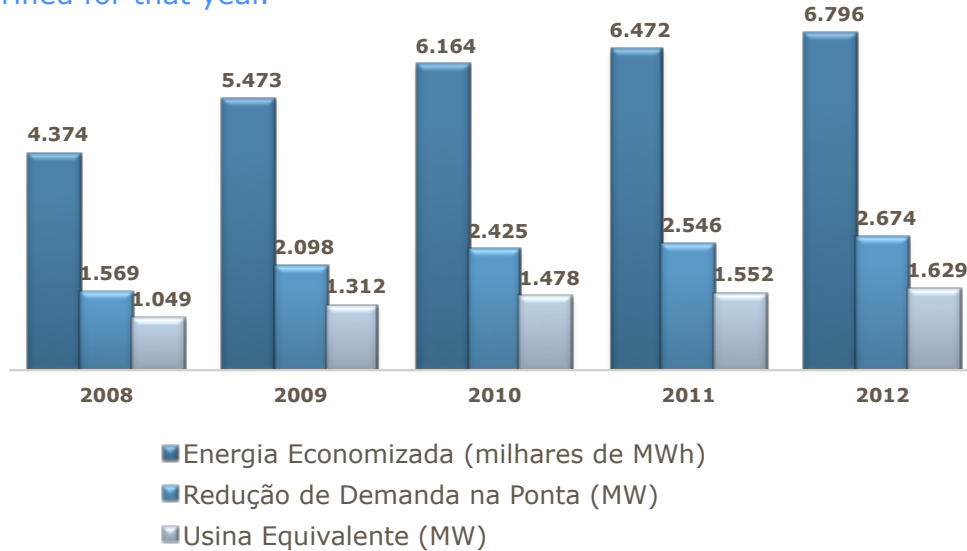
b) Electric Energy Saving, see below the graph with the evolution of the savings obtained with the Procel Electric Energy Efficiency Programs for the last years:



Procel – Energy Saved (GWh/year)

# Procel

In 2011, Procel saved about 1.5% of total consumption in electric energy for the amount verified for that year.



Source : Eletrobras – jan/12

Energy Saved (millions of MWh)  
Demand reduction at the End (MW)  
Equivalent Power (MW)

Considering all the information and data showed, it can be concluded that Sector Funds are of extreme importance as a source of financing and subsidy for the promotion of practices and projects that have as objective:

- (i) The development of a network of generation, transmission and distribution of electric energy all over the country, a basic condition for Brazil's industrial and social development;
- (ii) To promote efficient use of the electric energy available;
- (iii) The universalization of access to electric energy;
- (iv) Incentive to the development of alternative sources of electric energy.

## 8. Glossary

ACR - Ambiente de Contratação Regulada (Regulated Contracting Environment)

ANEEL - Agência Nacional de Energia Elétrica (Brazilian Electricity Regulatory Agency)

Capes - Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Coordination for the Improvement of Higher Level Personnel)

CNPq - Conselho Nacional de Pesquisa (National Council for Research)

Eletróbrás Cepel - Centro de Pesquisas de Energia Elétrica da Eletróbrás (The Electric Energy Research Center of Eletróbrás)

EPE – Empresa de Pesquisa Energética (EPE – Energy Research Company)

FNDCT – *Fundo Nacional de Desenvolvimento Científico e Tecnológico* (National Fund for Science and Technology Development)

Funasa - Fundação Nacional da Saúde (National Health Foundation)

GEF - Global Environment Facility

LPT - *Luz para Todos - Universalização dos serviços de energia elétrica* (Universalization of electric energy services)

MME - *Ministério de Minas e Energia* (Ministry of Mines and Energy)

PCH – Pequena Central Hidroelétrica (Small Hydroelectric Plant)

PMSS - Modernização do Setor de Saneamento (Program of Modernization of the Sanitation Sector)

PNCDA - Programa Nacional de Combate ao Desperdício de Água (National Program for Water Conservation)

PNUD - Programa das Nações Unidas para o Desenvolvimento (United Nations Development Program - UNDP)

PROCEL - Programa Nacional de Conservação de Energia Elétrica (The National Electrical Energy Conservation Program)

SIN - Sistema Interligado Nacional (National Interconnected System)

SNIS - Sistema Nacional de Informações sobre Saneamento (National Information System on Water, Sanitation and Solid Waste)

SNSA - Secretaria Nacional de Saneamento Ambiental (National Secretariat of Environmental Sanitation)

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