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**STATE MONOPOLY AND PRIVATE  
COOPERATION IN THE ELECTRIC  
ENERGY SERVICES IN BRAZIL**

*(Presented at the Latin American Seminar on  
Electric Energy, sponsored by CEPAL in Me-  
xico City – July 31st to August 12th – 1961)*

SÃO PAULO

1961



## Two conflicting thesis

### I

1. One of the concepts which is gaining ground among students of Political Science and Public Law is that which abandons abstract or unilateral thesis in the solution of fundamental problems of Public Administration since these call for a synthesized and unitary comprehension based on the consideration of multiple factors and situations.

Theories, such as those which purely in the field of principles weigh "free exchange" against "protectionism", "directed economy" against "free enterprise", "state monopoly" against "private initiative", etc., serve as indispensable points of reference but are always subject to the examination of facts in the formation of all social, historical, economic, financial, technical and political circumstances, in the light of which the problems are to be solved.

This is what happens also in the sector of production, transmission and distribution of electric energy, where debates have included arguments **in favour of or against** a given general thesis, in an array of conflicts which are apparent rather than real. Hence the need for visualizing the matter from a realistic and practical angle capable of affording solutions of a synthesized character, conforming to the "possible" and "feasible", having in view the interests of the public.

## II

2. The problem, which I propose to analyse, having been stated, only in accordance with abstract principles, each of which would be subject to the effects of various ideological factors, in general, we would have the following stock arguments into which the doctrinal preferences are divided and arrayed:

In favour of **state monopoly** <sup>(1)</sup>, it is generally stated, in the final analysis, that:

a) The electric energy industry is of such capital importance in the economic foundations of a Nation, that it can only be run by the State itself, under penalty of putting its sovereignty in jeopardy;

b) The benefits accruing from electricity ought to be assured to all classes of the people and this will only be achieved by an official plan which is at one and the same time of a political, social and economic character, not capable of being carried out by private undertakings, which always pursue limited or immediate ends. The need for planning the electricity services on a national basis, as much as its predominantly social character, therefore, rules out the possibility of granting any concession to private entities;

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(1) Obviously one should not confuse "monopolistic régime" with "régime of privilege or exclusiveness" — in the former, the State takes upon itself the whole electric energy industry and maintains it in the public sphere, exercising this activity either directly or through decentralized entities, such as autonomous or similar bodies; conversely, in the latter case, the State delegates the activity, in full or in part, in the form of **concession**, to private enterprises to which the right to exploit the service is granted on an **exclusive basis**, with the exercise of certain powers which would in principle belong to the public authority.

c) So essential is the electricity industry to the development of the other productive industries that the speculative character, inherent in the system of private administration, must be eliminated, in order to enable a supply of **cheap energy, even below cost**, as a primary condition of the policy of national development: the ruling out of the "profit motive" is a social requirement in the supply of energy;

d) Only the State can supply energy to the economically and culturally backward areas of the country, the complete lack of interest in which, on the part of private entities, is well known and understandable, and the development of those areas — essential to the welfare of the Nation — cannot be dependent on hedonistic calculations of private parties; if the Public Authority alone can break the tragic vicious circle which opposes progress (lack of energy because of low population density and production indices; insufficient population and production due to non-existence of energy), it is not justifiable for the government to remain only with the **burden** of the negative or onerous areas, leaving to private parties those of sure and immediate profit;

e) Only a state monopoly can resolve the grave problem created by a network of numerous small hydraulic plants, presently in existence, restricted to the immediate necessity of their respective zones of concession, where at times precious sources of energy lie unused with detrimental, although justified, lack of interest in the construction of great hydroelectric power plants necessary for relevant technical and economic reasons, and destined to supply vast regions with abundant power at a reasonable price;

f) In the electric energy industry all the requisites usually needed for the rational conversion of a

private enterprise into a public enterprise, are present: a) it follows practically standard technical methods in all its phases, viz. generation, transmission and distribution; b) the electricity generated is easy to meter and to control, which is in harmony with "bureaucratization" of the service; c) it requires a relatively limited number of personnel with technical specialization which does not pose any great problem;

g) In the electricity industry today the capital investment is so large, and its function is of such a basic character, that it naturally becomes a powerful political "pressure group", influencing public opinion and the government, and playing a decisive role in the enactment of laws; hence the necessity of removing such complex forces from the limited sphere of private interests, particularly if they are foreign interests.

### III

3. In their turn, the followers of the school which contends that electricity public utility services should be carried out exclusively by private enterprises, by means of a concession, state their point of view as follows:

a) A national program of production, transmission and distribution of electric energy — assuming that it is of proven necessity, or even preferable to the results spontaneously achieved by the free initiative régime — does not exclude but rather calls for the participation of private enterprises since, in principle, it would be for the Public Authority to outline the general plan of the services and to supervise them without, however, directly carrying them out;

b) Except in very exceptional cases, the cost of electric energy is so small an item in the cost of production and in the calculation of investments, that what is desired, in the final analysis, is the assurance of abundant energy and regular supply: state control inexorably leads to negative results, causing production and productivity indices to fall, which little by little would bring about a shortage of resources indispensable for preserving the electricity supply required by industrial development.

c) The advantages resulting from the elimination of the "profit motive" are more apparent than real because, if the public enterprise does not meet the cost of the service with realistic and adequate tariffs, the burden of expense falls on tax payers in general, in the form of tax increases;

d) The normal thing as a requirement of equity in the proportional distribution of social burdens is for the price of the service to be paid by the respective users. This principle is so essential that it would also be indispensable in the case of state ownership of electricity services;

e) Generally, state control produces what it was intended to avoid, that is, an increase in the cost of the services as a result of unavoidable pressure of party politics which, in addition to drawing investments away from their essential line of economic priority, gives rise to deficitary undertakings, generates "job-making", which eats away the state bodies charged with productive activities, at the same time increasing the number of those who demand energy without payment; the supply of energy by the State little by little becomes a form of subsidy, or aid;

f) Undoubtedly, it is the duty of the State to provide electric energy in areas where private enterprise does not find incentive or stimulus, and to supply energy at a low or subsidized price, but only temporarily, until conditions favourable to the normal and necessary remuneration occur;

g) To carry out this policy of a social rather than economic character the State should utilize private enterprise, participating in the results of fair rates by means of adequate and reasonable taxation, the responsibility of obtaining financial resources indispensable to the concession remaining with private enterprise.

Moreover, it is contradictory to want on the one hand to establish state control in order to eliminate the profit motive, and, on the other, to want to allocate the earnings obtained by the public enterprise in the more developed areas to the electrification of economically and demographically deficient areas;

h) The problem posed by the "pressure groups" does not only concern electric energy enterprises; it is a phenomenon inherent in the democratic process, but the Public Authority has the means of avoiding its evils and excesses. It may be added that the very nature of the electricity services, being conceded services, and of increasing standardization, are those which least lend themselves to concealed manipulation for defrauding the public.

#### IV

4. In point of fact, however, these arguments do not always imply the necessity for a choice between the public and the private régime. There are countries, such as Brazil, which by reason of the very vast area of



their territory and the diversity and complexity of their geo-economic regions, call for a **multiple solution**, in accordance with a national plan or program.

The idea of a general plan is not absolutely irreconcilable with the régime of concession of public utility services, and in the case of the production, transmission and distribution of electric energy which demand more and more complementation and interdependence of the systems, it is even desirable to condition the "privileges" or "exclusiveness" to a general regulation.

Accordingly, it is preferable to combine broad national policies for the rational development of the very vast electricity resources of the country with a system capable of permitting the coexistence of public and private action, complementing each other from the economic-financial and technical point of view, without exclusiveness or zoning based on prejudice that finds no support in experience.

This is the conclusion naturally reached when some aspects of the electricity problem in Brazil are examined. This conclusion is based on data expressing a reality which presents something unique and appropriate.

### **Some aspects of the problem in the light of the Brazilian milieu**

#### V

5. To examine the subject from the viewpoint of Brazilian reality, we must begin from the objective and global analysis of our conditions — starting by those of a historical nature — which throw a powerful light on our special circumstances.

It cannot be denied that the year 1934, in which the Water Code (Decree no. 24.643, of 10th July, 1934) was enacted, is a dividing line, in the history of Brazil, as regards the utilization of our hydroelectric resources, since, if, on the one hand, the necessary policy of regulation of the concession régime was commenced, the Federal Government being assigned an outstanding role as grantor of the services, on the other hand various requirements and restrictions were created which, in addition to reducing the possibilities of expansion of the then existing private enterprises, converted this field of industrial activity into a sector entirely unattractive to new private investments.

In 1943 when the old enterprises were still responsible for almost the whole of the country's electricity supply, the Government of the Republic endeavoured to reduce the evils consequent upon the new legal system and recognized the need to establish for these enterprises a transitional régime, to remain in force until the public authority decided upon a revision of their contracts, under which tariffs following a criterion of "reasonableness and uniformity" would be permitted. (Decree Law no. 5764 of 19th August 1943). Even though this regime, which is still in force, on the one hand afforded some relief to pre-Water Code entities, on the other hand it failed to open up attractive perspectives for new investment.

It is necessary to state that, the private companies have managed to maintain primacy in the supply of electric power under difficult conditions. The immense difficulties which afflict them have on various occasions been proclaimed by the Government <sup>(2)</sup>, wi-

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(2) It is recalled, among others, the formal announcement of the then Ministro da Agricultura, Sr. João Cleophas

thout, however, there being any coordinated measures capable to putting and end to the unjustifiable policies of distrust in relation to the responsible concessionaries in a field so essential to the economy of the country. Demagoguery, almost always inspired by a false nationalism, a pernicious tendency towards progressive bureaucracy of all public services, has impeded an objective study of the subject, forgetting the constitutional principle in force, since 1934, which determines that tariffs which will not only assure a just remuneration for capital but will also permit improvements and expansion to the services should be allowed to the concessionary. It was only recently that article 57 of law 3470 of November 28, 1958 allowed the concessionaries the monetary correction of their assets as per fixed coefficients established by the "Conselho Nacional de Economia" which is the first step towards an objective and realistic policy.

6. If to such elements of a judicial and political nature are added the consequences which naturally re-

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de Oliveira, in the exposition of motives n.º 452 of November 13, 1953: "Unquestionably, they (the power companies) perform public utility services; and, therefore it can only be acceptable as commendable, any norms which will protect their efficiency on a high technical level, as well as, on the other hand, defend the national economy against possible abuses.

It is not justifiable therefore the excessive rigor with which they are being treated by our laws, demanding their maximum subordination to Public Authorities without the compensating advantages, which normally correspond to the natural objectives of a private enterprise.

With regard to the administrative angle they complain that this regime contains facets which are truly drastic, placing them under the constant threat of extermination".

sult from other factors, such as vertiginous inflation, the continual aggravation of budget disequilibrium, the progressive deficits of our commercial balance, and the alarming shortage of exchange, which renders increasingly difficult the importation of the necessary equipment which the Brazilian industrial park is not yet able to supply, it must necessarily be admitted that at least for sometime yet we can only count on the contributions of the public authority and of the enterprises already established in the national territory.

In the final analysis, the problem relates to the possibilities or advantages of independent or combined action of the Government and of the present concessionaires which operate in the national territory, because it is not to be supposed that new private enterprises can be attracted to the electric energy industry in Brazil until the present situation is changed.

Here there is a "de facto" situation which establishes a premise essential to the consideration of the subject and which must be analysed in conjunction with other fundamental data, beginning from the elementary observation that in a country of about 65 million inhabitants, more than one-third of the population live in areas devoid of the benefits afforded by electric energy and it also should be borne in mind that in none of its areas is there a reassuring power surplus; there are, instead, indices of current, or imminent, shortage.

To say, then, that the solution of the energy problem is the basic condition of the struggle against underdevelopment, is a truism, although its due significance may not always be grasped. In fact, nothing is more illogical than to advocate state monopoly in a country where the electrical industry meets with difficulties of a financial nature which threaten to compro-

mise all the plans which have been made and which cannot be given up under penalty of the overthrow of all the others.

It having been agreed that the whole policy of economic development of the country, as a basic condition for the welfare of its urban and rural populations, must be based on the previous solution of the energy problem, in accordance with the plan of attaining a minimum of 8,000,000 kw by 1965, the main difficulty which arises is the lack of funds on the part of both the State and the concessionaires, and the total investment necessary to achieve this goal is estimated at one billion dollars, or Cr\$ 250.000.000.000,00.

Even admitting the possibility of an immediate substantial alteration in the situation of private investments, it is no less correct that the greater portion of the cost of the works should fall on the Public Authority, in view of the characteristics of the national territory and because it is a proven fact that the participation of the State in the production of electricity is essential.

Everything depends, however, on determining with due objectivity, the conditions and limits of state intervention, which, justified and necessary for various reasons, such as those mentioned in this work, should not be converted into an instrument of elimination of private enterprise, which is an essential part of the hydroelectric power policy of this country.

7. What, in effect, is immediately impressive, in the Brazilian energy situation is the profound disequilibrium prevailing among the various regions of the country. It is sufficient to mention that in 1958 the annual average index in Brazil was only 295 kwh "per capita", while in the area between São Paulo and Rio

de Janeiro this index was as high as 1,100 kwh, which brings that area to the same category as the countries which possess the highest economic standards. If the fact is taken into account that the 297 kwh average index includes consumption in the more developed areas, it is seen to what an alarming extent Brasil is short of power.

Making a comparison between the fundamental hydroelectric areas of the country, areas which are distinct from the point of view of geo-economic conditions of the development of the hydro-electric potential of Brazil (calculated, in the light of current hydrological knowledge, at 37,000,000 kw), we obtain a sufficiently clear picture of the subject (see Exhibit A) <sup>(3)</sup>.

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(3) The calculation above, of the hydroelectric potential was made by engineer Mario Savelli, taking into account only studies which have been completed and the regulation of water courses, in accordance with a work entitled "Energia Elétrica e Desenvolvimento Industrial no Brasil", published in "Eletricidade" a Portuguese technical journal, Vol. XV, July - September 1960, page 261 and following. Viewing the problem from a wider angle, engineer Alexandre Henrique Leal wrote, in "Cycle of Conferences on National Problems": "In accordance with official data of the Water Division of the National Department of Mineral Production, Brazil's hydraulic potential is in the order of 22,400,000 horsepower, or approximately 16,500,000 kw. It is important to mention that this estimate was made in accordance with patterns established by the **World Power Conference**, taking into account natural level differences and river flows which occur 95% of the time, not including, therefore, artificial falls, river diversions, diversion of water from one valley to another, nor the regulation of water courses. If all the possibilities of creating waterfalls by diverting water from one valley to another, regulating rivers or building high dams, were taken into account, it could be safely said that the country's hydraulic resources are in the order of 80,000,000 kw."

In the light of these data, it is evident that the resources required of the Public Authority for electric energy purposes, in the areas of thickest population, are of such magnitude that everything renders inadvisable any rigid and unilateral solution hostile to the cooperation and to the increase in generating capacity of private enterprises which, for the most part, have already been naturalized and become identified with the heroic process of breaking the barrier of underdevelopment.

Thus, without taking into account the multiple huge and urgent tasks that the Brazilian State has to undertake, in the field of transport, public health, education, basic industries, oil exploitation, etc., and referring only to the question of the supply of power, it is undeniable that the **multiple solution**, based on peaceful and fertile cooperation between the State and private initiative, is the natural course, indeed the only course desirable in the national interests.

Neither can it be alleged that many regions of Brazil, hitherto devoid of electric energy, will not measure up to the efforts and value of official investments. Against this pessimistic contention there is the example of the Paulo Afonso Plant, of the "Companhia Hidro-Elétrica de São Francisco" (CHESF), the maximum capacity of which was 69,000 kw in 1955, attaining 182,000 kw in 1960, with three units in operation and which are already insufficient to meet the demand of the vast consumer market, the expansion of which is an imperative necessity.

8. In short, in the sector under consideration, the fundamental achievements in Brazil are of such importance that they cannot be considered **separately**, in accordance with abstract schemes or ideological prejudice,

particularly by reason of the shortage of capital and of the necessary technical knowledge.

This, in fact, has been the political line recognized by the Government of the Republic at various times; in this connection, it is sufficient to recall the statement of Presidents Getúlio Vargas and Juscelino Kubitschek, in messages to the National Congress, in 1954, 1956 and 1958.

As regards the electricity generation problem, Getúlio Vargas placed special emphasis on the

“emergence of the State, and more especially, the Federal Government, as the great industrial producer of energy, either by means of its own enterprises, or by its association — whether on a majority basis or not — with public initiative, both regional and local, and with national and foreign private initiative.”

More specifically, envisaging a more objective discrimination between the public and private fields of action, President Vargas stated that the national electrification plan would be guided by the recognition that in principle the sector of electricity generation should be within the scope of the State, because of its specific conditions (high degree of mechanization and automation, personnel in reduced numbers, simplicity of operation, fixed capital disproportionate to the total value of the investment, great possibility of control and supervision), whereas, without prejudice to their co-participation in generation, to private enterprises should be reserved the sector of distribution, which requires a much smaller fixed capital, personnel in a greater number and services which vary with consumption demands.



In his turn, Juscelino Kubitschek put the problem, in its correct terms, in his proposal to increase our installed capacity from 3 to 8 million kilowatts up to 1965:

“By acting directly, supporting the initiatives of various state governments which created **mixed-economy** electricity enterprises and allocated special funds to their capital, and by **strengthening private initiative** — acting simultaneously in all sectors — it will be possible for the Federal Government to create the conditions required for the great progress which Brazil demands of its electricity industry.

**We cannot waste time or seek exclusive and theoretical solutions.** The lack of electric energy would condemn us to inevitable economic stagnation. We must act promptly, with common sense and objectivity. To this end, we must also combine efforts and apply them in accordance with a coordinated plan of action.”

Finally, in his first message to the National Congress, President Janio Quadros, after demanding “the formulation of a clear and objective policy, which will, give incentive to private enterprise, and will guarantee their access to the normal sources of finance both in this country and abroad” emphasises, with healthy realism, the necessity of coordinating public and private efforts to such an important task:

“Notwithstanding the coordination of all efforts, both public and private, declared the Chief of the Nation, towards maintaining adequate electric services, it will not be easy

to mobilize, either in this country, or abroad, the volume of financial resources for investment in electric energy, required by the expansion of the Brazilian economy. This circumstance increases the necessity in programming large electric enterprises, both state and private, in close collaboration with the financial entities of the country, not only to integrate them in the existing system but also to determine the extent of priority and speed in execution of each project."

9. In reality, this multiple and flexible policy is today the basis on which the whole system of electric energy production, transmission and distribution of Brazil rests, as can be seen from the data in **Centre-South Region**, in **Exhibit B**.

In fact, in this 770,000 sq. km. area, with a population of 27,000,000 (see **Exhibit A**), the electricity services are carried out in close cooperation between the Public Administration and private entities, and it is observed that sometimes the private enterprises participate in entities controlled by the Public authority (example is "Central Elétrica de Furnas"), and sometimes public entities participate, through capital subscription, in the expansion of private undertakings (as is the case of "São Paulo Light S. A. — Serviços de Eletricidade").

In the Centre-South Region the most important achievements are those of the "Light" Group which is composed of two fundamental sectors, the "São Paulo Light S. A. — Serviços de Eletricidade", with 893, 171 kw installed hydro-electric capacity and 286,399 kw thermo-electric capacity, and the "Rio Light S. A. — Serviços de Eletricidade e Carris", with the "Cia. Flu-

minense de Energia Elétrica”, with 684,000 kw capacity, almost all of which is hydro-electric. One notes that the São Paulo Light, an enterprise which was nationalized in 1956, has the shareholding participation of the National Bank for Economic Development, in a total of Cr\$ 1.300.000.000,00, and shares in the value of Cr\$ 1.000.000.000,00 have been subscribed by about 34,000 small shareholders residing in the country.

In order to understand what the Light group represents in the total national production of energy, it is sufficient to examine the following figures in kWh, relative to the year 1959:

**Electric energy production in Brazil in kWh – 1959**

Light Group .....	10.500.000.000
Empresas Elétricas Brasileiras .....	2.705.000.000
Cemig .....	851.000.000
Chesf .....	751.000.000
Ceerg – R. G. S. ....	663.000.000
Uselpa .....	133.000.000
Cherp .....	31.000.000
Others .....	5.866.000.000
<b>TOTAL .....</b>	<b>21.500.000.000</b>

To those who insist on ignoring the present contribution of the Light group to the Brazilian electric field, I will call to mind that during the last five years the increase in installed potential, in the whole country, was 1,352.000 kW of which almost half (566.489 kW) was installed by the Light.

10. As can be seen from **Exhibit B**, by the outstanding engineer Mario Savelli <sup>(4)</sup>, in addition to this energy

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(4) Cf. study published in the Portuguese journal “**Electricidade**”, already mentioned, and data shown in publication

system still in expansion (since work is under way to supply an additional 355,000 kw), other generating plants are being built which by degrees will alter the proportion of public enterprises to private enterprises in the overall electricity generation scheme.

In the first place, there is the "Central Elétrica de Furnas S. A." undertaking, whose plant of 1,200,000 kw capacity is being built at a rapid pace. It is an outstanding example of the combination of multiple activities into a **mixed-economy body** which unites capital and technical experience of the Federal Government, the State of Minas Gerais (through the "Centrais Elétricas de Minas Gerais" — CEMIG), the State of São Paulo (through an autonomous body, the Department of Waters and Electric Energy — DAEE), the "São Paulo Light S. A. — Serviços de Eletricidade" and the "Companhia Paulista de Fôrça e Luz". The Furnas plant is destined only to generate power which will be distributed by public and private entities in the States of Minas Gerais, São Paulo, Rio de Janeiro and Guanabara. As is seen it is an undertaking in which, as was said by the outstanding engineer, John R. Cotrin <sup>(5)</sup>, president of that entity, the participation of the said private enterprises

"is effective, both from the financial and from the technical-administrative point of view, and thus the combined experience of the specialized government bodies and of traditional enterprises of proven ability and standing in this field is utilized".

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made by the "Instituto de Engenharia de São Paulo", entitled "Semana de debates sobre energia elétrica".

(5) Cf. journal "Eletricidade", vol. 15, July-September 1960, page 286 — "A Usina de Furnas".

Another example of cooperation is the Salto-Funil plant the construction of which was assigned to another mixed-economy company, the "Companhia Hidroelétrica do Vale do Paraíba", in which enterprise the Federal Government, the "Companhia Siderúrgica Nacional", the "Rêde Ferroviária Nacional" and the "Rio Light S. A. — Serviços de Eletricidade e Carris" participate.

While private bodies endeavour to meet — or even anticipate — the growth of demand (see Exhibits B and D), the Public Administration creates federal and state bodies. Outstanding examples of this are the São Francisco Valley Commission, a federal autonomous body that has the collaboration of "Centrais Elétricas de Minas Gerais" which is completing the huge work of Três Marias — a hydroelectric plant of 560,000 kw capacity and a 20 billion cu. m. reservoir destined to play a major role in the prodigious São Francisco river Valley; the "Usinas Elétricas do Paranapanema S. A." (USELPA), the "Companhia Hidroelétrica do Rio Pardo" (CHERP), the last two enterprises being mixed-economy companies in which capital of the São Paulo State Government is predominant.

11. The entry of the administrations of the federated States in the electricity expansion program is a new factor to be taken into consideration, not only because of what has already been achieved, but above all on account of the prospects afforded by it. In fact, it should be recalled that from 6,000 kw generated in 1958 by three small thermal plants, the São Paulo State Government's production, in November 1960, increased to 131,900 kw, of which 105,900 kw was contributed by hydro-electric plants. An increase of 316,000 kw is planned for 1963. It is foreseen, in addition, that the

São Paulo State Government's plants will increase their installed capacity to about 650,000 kw over the next three years. Examining the problem in the light of **Exhibit B**, that is, having in view the preliminary projects and works relating to the Xavantes plant, the first stage of Urubupungá, Ibitinga, Caraguatatuba, etc., it is seen that the task which the State has undertaken for the next decade totals more than 3,000,000 kw (see **Exhibit C**).

Therefore, by private enterprises and governmental autonomous bodies, mixed-economy companies and direct administrative bodies, the federal or state Public Authority either engages only in the production of energy, or carries on the electrical industry in all its phases. Thus, a multiplicity of forms of action is observed, to which corresponds a multiplicity of technical methods in a brilliant combination of thermo-electric with hydro-electric energy and, in future, nuclear power, not only because of different conditions (lack of water sources and relative local abundance of fuels), but also for technical reasons relating to the equilibrium and complementation of the system.

It is well to ponder, that the projected creation of ELETROBRAS does not propose a regime of state monopoly, but aims rather to supply the Federal Government with financial and technical resources indispensable in the fight against under-development as regards production of energy, without hurting the fundamental contribution of the private companies and those belonging to local Governments.

## VI

12. If the possibility is taken into consideration, of interconnecting the various systems, it will become

even more clear that, at least in Brazil, the abandonment of the policy of coexistence of public and private enterprises would only present disadvantages.

If one of the arguments in favour of state control of the services is that electric energy must be chiefly considered as a function of the country's economic development, it does not hold true when private enterprises actually keep pace with the rhythm of production in the areas in which they render services providing in advance resources of energy which decisively allow the development of industrial activities. In this respect, **Exhibit D** is very eloquent, showing that in Brazil's area of highest economic development, the population density, generating capacity and electricity consumption indices have grown together in an astonishing correlation.

It is also manifest from this table that the surprising industrial development which took place in São Paulo over the past decades, indicates, as one of the principal reasons for the application of capital and investments, the existence in the region of an "energy availability or reserve" which could normally meet the requirements of consumers, in fully satisfactory technical conditions.

13. On the other hand, in the case of Brazil, the argument that the State will be overburdened with the deficitary areas, the private enterprises remaining with the areas of greater economic importance, does not apply. In fact, the collection of the sole tax on electric energy has been a major source of funds for future public investments. Looking only at the case of the "São Paulo Light S. A. — Serviços de Eletricidade", it is seen that this company, during the period 1955 to

1959, allocated to the "Federal Electrification Fund" the considerable sum of Cr\$ 2.222.491.000,00, which then corresponded to one fifth of its capital.

Also, if, following the reasoned thinking of engineer Octávio Marcondes Ferraz, former Minister of Transport and Public Works, "the very small incidence of the cost of energy in the total price or cost of utilities, except for a few activities (such as electrochemistry and electrometallurgy) <sup>(6)</sup> is considered, it follows that the freezing of tariffs, in an economy characterized by a rapid rate of inflation, is undoubtedly tantamount to endangering the two fundamental requirements for our economic development: abundance of energy in technical conditions of security and sure utilization; possibility of expansion of the services in order to meet the growing demand of consumption.

14. If, in fact, there are in Brazil favourable conditions, and more than this, conditions which unquestionably require a **multiple solution**, it is indispensable that the reasons for confidence in such a régime be strengthened by a clearer and more positive recognition that the electricity enterprises carry on functions delegated to the Public Authority and that, therefore, the State prejudices itself, that is, the community, when it fails to meet the economic-financial equilibrium of the concessionaires, not only so that they may subsist, but

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(6) Cf. Octávio Marcondes Ferraz — "O problema do suprimento de energia elétrica", São Paulo, 1955, page 22. According to this work (page 17), the portion represented by the cost of electric energy was in 1950, 0,58% of the total value of Brazilian production. In 1957, according to figures of the "1957 Industrial Census" carried out by the Brazilian Institute of Geography and Statistics, the proportion of electric energy in the total cost of industrial production was 0,98%.



also so that they be permitted to expand their systems normally.

At this point, the following words of Mr. Waldemar de Carvalho deserve special mention as ex-General-Director of the Divisão de Águas (Water Department) and member of the Conselho Nacional de Águas e Energia Elétrica (Water and Electric Energy Council):

“The action of the concessionaires will be more deserving, if attention is paid to the negative factors they acted against in specific legislation concerning electric energy.

“The obstructions to the development of electricity can be summarized as follows:

- 1 — inadequate tariffs
- 2 — financing difficulties
- 3 — obsolete organization of federal department responsible for water and the electric energy field <sup>(7)</sup>.

To summarize, by means of an effective and sincere policy expressed in concrete and objective governmental acts, and by the concomitant clarification of public opinion, it is necessary to consolidate and to give impetus to the régime of coexistence, assuring effectively for private entities remunerative and fair tariffs, so that, as stated in the Federal Constitution, in article 151, sole paragraph “the earnings of the concessionaires, without exceeding the fair remuneration of capital, may permit them to meet the requirements of improvement and expansion of these services”.

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(7) “In” “Energia Elétrica, Estatismo ou Iniciativa Privada” (“Electric Energy, statism or private enterprise”) published in 1960 by the Electric Energy Industry Syndicate in the State of São Paulo”.



## GENERATING CAPACITY IN BRAZIL

AS OF 12-31-1959

REGIONS	AREA (Km <sup>2</sup> )	POPULATION	INSTALLED GENERATING CAPACITY (kW)	ESTIMATED UNDEVELOPED HYDRO CAPA- CITY (kW)
I — CENTRAL-SOUTHERN States: Guanabara, Rio de Janeiro, São Paulo, southern part of Minas Gerais and most of Espírito Santo and Paraná.	770.000 (9%)	27.000.000 (41%)	3.374.000 (82%)	23.000.000 (62%)
II — SOUTHERN States: Santa Catarina, Rio Grande do Sul and small part of Paraná.	430.000 (5%)	9.000.000 (14%)	225.000 (6,25%)	3.000.000 (8%)
III — CENTRAL-NORTH-EASTERN States: Bahia, Sergipe, Alagoas, Pernambuco, Rio Grande do Norte, Ceará, Piauí, Maranhão and part of Pará, Goiás and Minas Gerais.	2.800.000 (33%)	25.000.000 (38%)	445.000 (11%)	5.000.000 (13,5%)
IV — CENTRAL-NORTH-WESTERN States: Mato Grosso and part of Goiás and Pará. Territories: Amapá, Rio Branco, Acre and Rondônia.	4.500.000 (53%)	4.000.000 (7%)	31.000 (0,75%)	6.000.000 (16,5%)
<b>TOTAL FOR THE COUNTRY</b>	<b>8.500.000</b>	<b>65.000.000</b>	<b>4.115.000</b>	<b>37.000.000</b>



# GENERATING CAPACITY INSTALLED AND UNDER CONSTRUCTION IN THE STATE OF SÃO PAULO

AS OF 11-1-1960

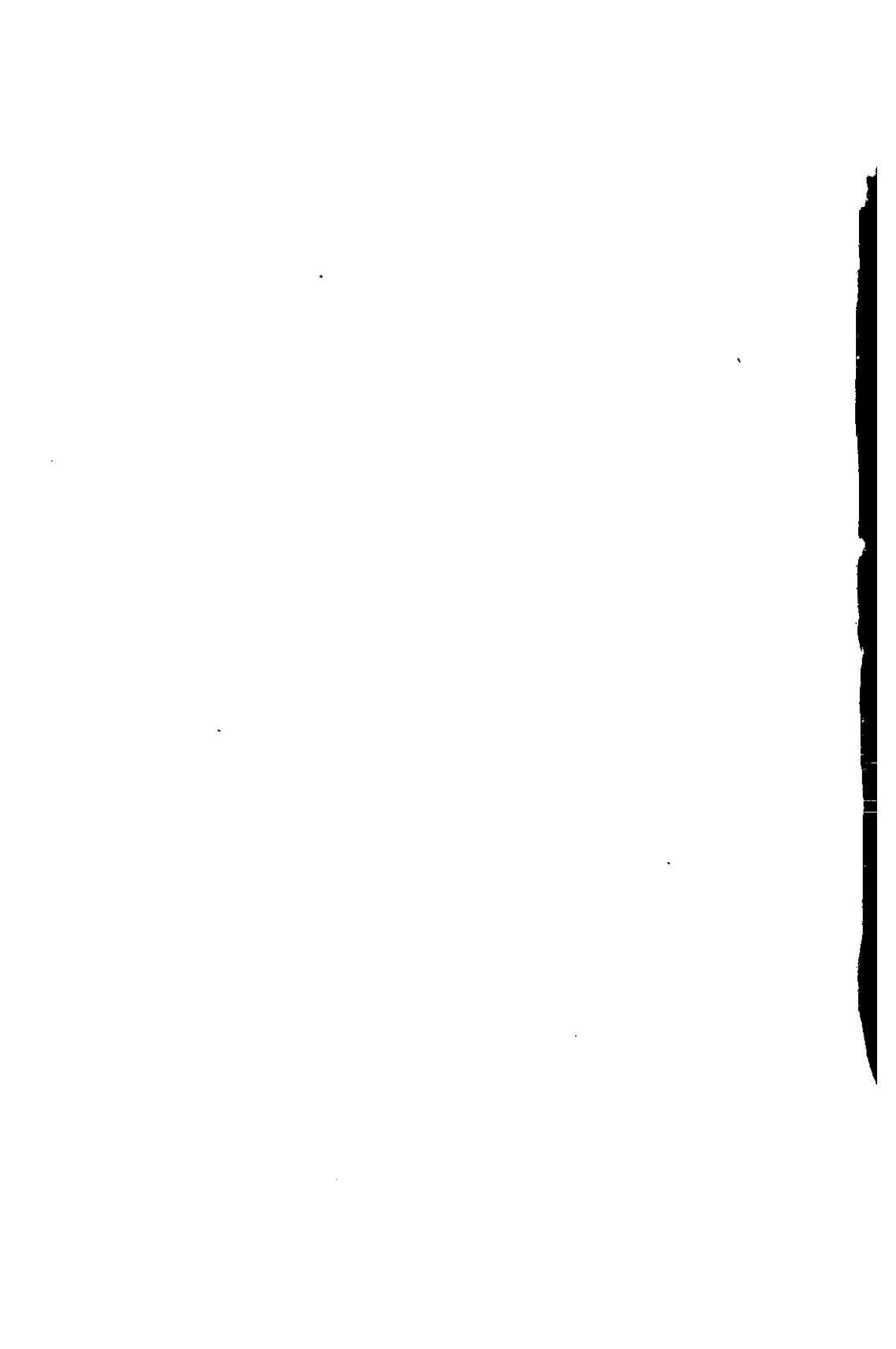
## INVESTOR OWNED ENTERPRISES

ENTERPRISES	AREA SERVED (Km <sup>2</sup> )	POPULATION	INSTALLED GENERATING CAPACITY (kW)	GENERATING CAPACITY UNDER FULL CONSTRUCTION (kW)
SÃO PAULO LIGHT S. A. -- Serviços de Eletricidade	20.200 (8,25%)	4.500.000 (37,7%)	1.180.400 (62%)	190.000 (61,5%)
EMPRESAS ELÉTRICAS BRASILEIRAS (Cia. Paulista de Força e Luz)	77.000 (31,20%)	3.200.000 (27,3%)	230.000 (12,9%)	80.000 (26,0%)
COMPANHIA BRASILEIRA DE ALUMÍNIO	Aluminum Plant	--	30.000 (1,68%)	38.000 (12,5%)
OTHER SMALL UTILITIES OR INDUSTRIES	150.022 (60,55%)	4.300.000 (35%)	343.600 (23,42%)	--
<b>TOTAL FOR THE STATE</b>	247.222 (x)	12.000.000	1.784.000	308.000

(x) 2,9% of the area of the country.

## GOVERNMENT OWNED ENTERPRISES

INSTALLED GENERATING CAPACITY .. 131.900 kW GENERATING CAPACITY UNDER FULL CONSTRUCTION ..... 524.500 kW  TOTAL ..... 656.400 kW	<b>GENERATING CAPACITY UNDER INITIAL CONSTRUCTION</b> XAVANTES P/P -- Paranapanema River .. 300.000 kW JUPIÁ P/P (URUBUPUNGÁ DEVELOP- MENT) -- Paraná River ..... 1.350.000 kW  TOTAL ..... 1.650.000 kW
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*Este livro foi composto e impresso nas  
oficinas gráficas de SARAIVA S. A., à  
Rua Sampson, 265, São Paulo (Brasil),  
em julho de mil novecentos e sessenta  
e um, 407º Ano da Fundação da Cidade  
de São Paulo.*

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