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THE POLICY METHODS AND EXPERIENCE OF THE
ELECTRICITY ADMINISTRATION AND DEVELOPMENT COMPANY (CADAPE)
OF VENEZUELA IN REGARD TO RATES

by Luis E. Galavis

Note: This text is subject to editorial revision.

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One universally accepted premise is that electric power is a decisive instrument in a country's economic and social development. Rates play a most important part in the use of that instrument. Depending upon the way in which they are conceived and applied, they will be a source of expansion or bankruptcy for the electrical industry and, for the country, an element which either stimulates or hinders its economic development. We believe, therefore, that such an important matter should be fully considered at this first Latin American Electric Power Seminar and, with this object in view, we present the principles we uphold and the experience we have had in the matter of electricity rates.

1. Historical outline and experience

As in most Latin American countries, the development of electric power in Venezuela has been slow and difficult, in spite of the fact that in some cities the expansion of the electric services has presented some extraordinary features as far as its historical rate of growth is concerned.

The forerunners of the electric industry of Venezuela were private entrepreneurs. The first installations consisted of small plants which fed local networks and operated only during the night. As might be expected, taking into consideration the conditions of supply, the cost of the power was very high and the completely rudimentary rates were generally paid in the form of a fixed sum per month for each bulb installed.

Slowly the services were improved, the plants extended and production costs lowered. The process developed gradually until 1946, when owing to the war there was a heavy power deficit. The supply of electricity was at this time in the hands of private enterprises and of some Municipal Councils and State Governments, which operated small isolated plants. Markets with a high rate of consumption were adequately served by private companies, but the rest of the country did not have a satisfactory supply of electric power, because the service provided by the official installations was precarious and deficient.

The founding in 1946 of the Venezuelan Development Corporation (Corporación Venezolana de Fomento - CVF) marked the beginning of a State electricity supply. Actually the capital of the CVF was formed partly

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from the allocation by the Federal Government of all the investments in electricity the State had made up to that date and shortly after its foundation the C.V.F. contracted the services of foreign experts with whom they drew up the first national electrification plan. This plan developed with mixed success over the years, during which the Corporation acquired various plants and installations, which were grouped together on a regional basis as semi-autonomous companies, working independently of each other and serving only the areas assigned to them.

In 1958, the development of these companies (15 in number) had become so involved that the C.V.F. considered it prudent to amalgamate them to secure absolute agreement on all technical and administrative questions and the concentration in one body of all national programming and projects. The object of this was to ensure that there was programming on a national scale and not 15 separate programmes, one for each company, which had existed up to that date.

Thus in November 1958 the Electricity Administration and Development Corporation (Compania Anónima de Administración y Fomento Electrico - CADAPE) came into existence.

The growth of demand for electricity in Venezuela in the last 15 years has been extraordinary. A report from the Office of Co-ordination and Planning^{1/} shows that between 1945 and 1955 the gross geographical product rose at an average rate of 11 per cent per year, whereas the consumption of electricity grew at the rate of 19.5 per cent.

It may be said that to-day all the State capitals have an adequate supply of electric power, either from private companies or CADAPE. However, in spite of the heavy investments made in the electrical industry Venezuela cannot be regarded as a sufficiently electrified country as there are still urban and rural areas which entirely lack this vital element of economic and social progress.

The trend, seen in other Latin American countries, of the electrical industries towards the predominance of public enterprises can also be observed, on a growing scale, in Venezuela. In spite of the fact that

^{1/} Office of Co-ordination and Planning, Four Year Plan - Power, Caracas 1960.

private enterprises were the forerunners of electric development in that country and that they visibly and effectively contributed to its progress, the problems that confront them, mostly of a financial nature, have caused the public sector to acquire a steadily increasing share in the supply of electric power.

Thus, according to the Office of Co-ordination and Planning^{1/}, the public sector's share of installed capacity has grown from 26.1 per cent in 1948 to 38.8 per cent in 1959, and it is estimated that in 1964 it will reach 51 per cent.

As to rates, it will be seen in general that their evolution, from the point of view of procedure and purpose, has not kept pace with progress in the technology of the installations.

The electrical industry, and principally that part of it which is publicly owned, has striven to extend the installations and improve their technical quality, and has relegated the question of rates to second place. The private companies were the first to introduce rates on a rational basis, as they were also the first to introduce new construction and operational techniques for plants and transmission lines. For example, in Caracas hourly maximum demand rates are used successfully even in the residential services.

The rates of the amalgamated enterprises constituting CADAFE were completely out of date, having been inherited from the original companies.

In principle, it can be said that the rates which were applied by the 15 enterprises of the C.V.F. were not worked out according to any definite policy or adequate rating procedure; they merely used, with slight modifications the same rate structures which had been inherited from the municipal, State and private enterprises when these were acquired by the C.V.F. as its own property.

The above assertions are based on the fact that none of the tariffs shows any attempt to lay down a consumption policy or even to promote sales. There was no tariff which took the load factor into consideration as a vital element in the price of electric power. Some rates were far too high,

^{1/} See footnote ^{1/}, page 1.

others so low that they did not cover even the depreciation of the installations. None of them was worked out with any idea of an adequate return. Structurally, they were excessively complicated. In short, the tariff system of the C V F enterprises never got beyond the rudimentary stage of rates, with no technical basis whatsoever.

The companies under public ownership in Venezuela as apparently in other countries too, had not considered up till then that tariffs should be a source of financing for the expansion of installations.

When CADAFE assumed the administration of the electrical enterprises it was found necessary to change some ideas about the policy and procedure to be followed. It was felt, inter alia, that a new approach was required to the system of tariffs and it was given the importance that it should have in the electrical industry. The first step was to adopt a definite policy which did not exist before and to abandon the empirical approach which had hitherto regulated the fixing of rates.

For reasons easy to understand, an abrupt change in the system of tariffs was impossible, and the old structures are still maintained in a great part of the CADAFE territory. The first steps which have been made towards the total reformation of the tariffs have been studies on the following aspects:

- (i) Adoption of a tariff policy;
- (ii) Adoption of rational tariff methods and systems;
- (iii) Unification of tariff structures on a national scale.

At present new tariffs for the different Regional Administrations of CADAFE, following the lines laid down in the above-mentioned studies, are under way.

The preparation of new tariffs has been undertaken on the basis of exhaustive studies in each of the zones, so that an integrated system can be devised for the whole country. Owing to the complexity of this type of work, up till now the study of only one of the 15 zones in the CADAFE territory has been completed. Again, in many cases it has become necessary to recast individual tariffs in some Administrations owing to the fact that, because of their obvious ineffectiveness, they could not be retained pending the termination of these studies.

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The tariff policy adopted by CADAPE is given more fully in the next chapter of this paper. For the present the following brief outline of the main points will suffice:

To endeavour to supply electric power at the lowest prices compatible with an efficient service and with the financial stability of the company;

To pursue a consumption policy directed towards the optimum and maximum use of power in accordance with national economic policy;

To consider that the electrical industry is essential to social welfare and economic development and is in the public interest, but that, at the same time, it needs to develop in an atmosphere of understanding and provide fair returns.

The technical principles which underlie the establishment of tariffs are contained in the last chapter of the present paper and are intended to achieve the following objectives:

Unification of tariff structures on a national scale, but with different prices according to costs in each zone;

Recognition of the importance of the load factor as an essential element of the tariffs;

Promotion of the use of power;

Determination of prices, taking costs into account, but also considering the economic and social factors, etc., which affect the supply of power.

We consider it interesting to analyse some aspects of the experience in the matters of tariffs which CADAPE has had in its short period of activity. We imagine that these aspects include conditions common to many Latin American countries, but, nonetheless they are still of value in evaluating the problem. What is more, we believe that this very fact should prompt the electrical industries of Latin America to act together in defence of principles which are vital to the development of electricity and, therefore, to the improved welfare of the people.

In the first place we should refer to the attitude of the consumer in respect to rates.

Since 1958, we have been faced by a movement, not only on the part of subscribers, but also of certain organizations, even of governmental ones

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like the Municipal Councils etc., which aim at a reduction in the electricity rates. This has appeared in some cases as a regional movement. In some zones it has gone to the extreme of causing strikes among consumers who refused to pay their bills unless their demands were complied with. Even some acts of violence were perpetrated against the company's installations and premises.

It would seem as if electricity rates had come to be looked upon as a campaign symbol whenever protests are voiced in a country against the rising cost of living, but, in general, campaigns in favour of lowering tariffs are of purely emotional origin, considering that the price of electricity represents a very small proportion of the family budget or the cost of industrial production.

We have the impression that this phenomenon is more noticeable in zones which are served by public utilities, and this may be due to the fact that frequently the function of the State in guaranteeing public services is misinterpreted as an obligation to render those services at below-cost prices. On the other hand, in centres with an under-developed economic structure, where State intervention is very preponderant, there is a tendency to think of Government enterprises as organizations whose capital can be freely squandered.

The foregoing does not mean to say that private enterprises are free from such pressure, but in our own specific case the movements referred to have been more strongly felt in the sector served by the Government. The cause of this may be also that the areas supplied by CADAPE are the least developed in the country, where personal incomes are obviously very low and the price of power appears high in comparison.

In some cases we find that there were some grounds for complaints owing to the high price of the tariffs in force or to some deficiency in their structure, and then we agree to modify them, but in most cases we do not make any reductions as our operational costs do not permit it. We always defend the position we have adopted, even though this is difficult at times, and that is, first and foremost, to protect the financial stability of the enterprise.

To maintain that position we had to launch a public relations campaign

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to give each and every subscriber a clear and true picture of the difficulties attached to the supplying of electricity. In this connection, we believe that if Government organizations and social and economic associations collaborated in the public relations campaign of the electricity enterprises, this could give the public a better understanding of the problems which face the electricity industry and, consequently, lead to a better solution of these problems for the common good. To obtain such collaboration on a continental scale would be a practical undertaking for the Latin American organizations interested in the development of electric power.

The two positions in regard to tariffs are well defined. On the one side there are those who maintain, with justification, that the electrical industry should contribute, at least in part, to its own self-financing and, on the other side, those who argue that State enterprises should lose money if this is necessary to supply power at a low cost. Our position is clear: we are with those who defend the principle of self-financing of the industry, whether in the public or private sector.

Another experience to which we wish to refer is the application of a limited residential tariff, later called the "social tariff."

A preliminary review of the tariffs which we were inheriting showed us that the establishment of this social tariff would be justified. As a first step in this direction, we made an analysis of consumption frequencies, which showed surprising results with respect to the low level of consumption in the greater part of the areas served by us. In some, which even included relatively large centres, it was seen that in the residential sector more than 70 per cent of the subscribers used less than 20 kWh per month, and all of them together represented less than 30 per cent of total consumption in the area in question. This group of subscribers was analysed in even greater detail, and it was seen that a very large group of them used less than 10 kWh per month.

Many of the tariffs in force had a minimum consumption guarantee above the averages mentioned, which meant that the unitary price per kWh charged to those subscribers amounted in some cases to Bs. 0.90 per kWh, (0.27 dollars per kWh). This feature of the high cost per kWh naturally produced a negative response among the subscribers who felt cheated and, instead of

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increasing their consumption to exceed the minimum stipulated and thus enjoy a more acceptable price per kWh, tried to cut it down without any economic benefit to themselves and finally ended by joining in the public complaints or resorting to fraud as the only method of defence. Faced with this situation it was considered that a decrease in the minimum consumption guarantee would be beneficial to the subscribers with low incomes and, at the same time, would raise the work being done by CADAPE in the public's estimation. Owing to the fact that this reduction in the minimum consumption was an act of social justice in favour of the low-income subscriber, this tariff was called the "social tariff". It has been our experience that wherever the social tariff has been introduced relations with the public have undergone a substantial change for the better, and, owing to the psychological effect on the subscriber, it has resulted in a progressive increase in consumption and, in a relatively short time, the initial deficit that this tariff entailed for the enterprise has been made good.

The introduction of the social tariff helped to solve many of the problems which faced us. It is being applied in all the zones as a limited residential tariff for that group of subscribers whose monthly consumption is usually less than 15 kWh. The minimums fluctuate between 10 and 12 kWh and the unit price is the same as that of the first category in the ordinary residential tariff, thus anyone who is eligible for the social tariff, and who increases his consumption, automatically passes to the residential tariff without an abrupt change.

As was said before, in some zones we were obliged to make preliminary and isolated studies of certain tariffs as they were notoriously inadequate and they were modified at once, without waiting for the study of the whole zone. Generally the abnormalities observed could be traced principally to the structure and type of tariffs. We will cite some examples: tariffs with a single and very high price; sliding scale tariffs with the first categories so large that they were tantamount to single price tariffs; various consumption minimums in one and the same tariff which actually converted it into a series of single price tariffs which were applied according to the supposed level of consumption of the subscriber; tariffs with only "energy charges" applied to the large-scale industrial consumption; heterogeneous tariffs

used in neighbouring population centres, etc.

In most of the cases mentioned a reorganization of these tariffs was embarked upon, generally at the expense of a small reduction in prices, but in every case the drop in income was soon offset by a rise in consumption.

There is no doubt that many of the problems and conflicts relating to tariffs can be traced to a lack of proper legislation on this matter. At the present time a bill dealing with the electrical industry is under consideration in Venezuela which will no doubt contain appropriate measures for regulating the supply of electricity. We are confident that regulations based on sound economic judgement will be of great use not only for the consumer but also for the enterprises, and that the movements in favour of price cuts will peter out when there is legislation in force to determine the tariffs.

We also wish to call attention to a trend noted in Venezuela as in other countries: while the prices of most consumer goods and services have constantly risen, the price of electricity tends to fall.

To avoid entering into numerical details, we will refrain from giving the indices of variation which are, for the most part, more or less similar in the different countries in which this tendency is observed. But we would like to establish clearly the fact that, in spite of the steady rise in the cost of electrical construction, principally in equipment and material, in spite of the increase in wages and salaries and in spite of the persistent rise in the cost-of-living index, the price of electricity has remained at least stable, if it has not decreased. The significant fact should be realised that, although the fall in the price of electricity has meant smaller profits for the electrical industry, it still invests large sums in the expansion of its installations. This is attributable to the efforts of the enterprises to cut operational costs by increasing efficiency on the administrative and technical side. It should also be borne in mind that the advantages thus derived from these efforts are also passed on to the subscriber in the form of lower rates and better service.

It is interesting to analyse the impact of a reduction in electricity rates on the family budget and industrial costs, and on the economy of the electricity enterprise. Studies made in the residential districts, based

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on surveys carried out in various markets of the country^{2/} show that a cut in rates from 10 to 15 per cent would be reflected in the following proportion in the family budget. The group of consumers who have an income of about Bs.400 (120 dollars) per month and whose electricity bill is on an average Bs.5 (1,50 dollars) will save Bs. 0.50 to Bs. 0.75 (0.15 to 0.23 dollars) per month; the group with incomes of Bs.500 to 1,000 (150 to 300 dollars) whose bills amount to Bs.15 (4.50 dollars) on an average, will save Bs.1.50 to Bs.2.25 (0.45 to 0.67 dollars) per month; and the group with incomes between Bs.1,000 and 2,500 (300 to 750 dollars) per month, and whose average bill is between Bs.35 to Bs.50 (10.50 to 15 dollars) will save a maximum of Bs.7.50 (2.25 dollars) per month.

It will be seen that, while the average consumer's saving as a result of the tariff cut is very small, the loss of income to the supply company can weigh dangerously on its economy.

The price of electricity as a factor in industrial costs is well known. Except in a few industrial processes this factor is generally very minor. What industry principally needs is plentiful and reliable power at reasonable prices.

The foregoing explanation allows us to sum up the situation of the electrical industry thus: so long as the consumer is not properly informed about these problems and the Government organizations do not adopt an attitude that is sound and just in the matter of tariffs, the electrical industry cannot properly play its part in the economic and social development of the people, which is to supply plentiful and reliable power at reasonable prices and so contribute to a rise in the social, cultural and economic level of mankind.

For this reason we wish to second the opinion of the authors of the book entitled "Electric Power Regulation in Latin America"^{3/}, dealing with the problem of electricity in Latin America, which states that what Latin America needs is not cheaper but more electricity.

2/ Memoria de CADAPE, 1958-1959.

3/ D.F. Cavers and J.R. Nelson, Electric Power Regulation in Latin America (The John Hopkins Press, Baltimore).

In conclusion, we wish to ask for suggestions from the present Seminar, if this is possible under its terms of reference, regarding the necessary conditions for obtaining this greater quantity of power at reasonable prices, which is what, all Latin Americans desire to stimulate their under-developed economies.

2. CADAFE's policy

In the absence of adequate legislation on electricity which, as we have said before, is pending, CADAFE has had to include in its general policy some aspects that might be classified more appropriately as regulatory provisions.

The fundamental principle governing the programme of electrification, which is the responsibility of CADAFE, is that of considering the function of electric power as an instrument of social and economic development. The main purposes of this programme are: (a) the overall planning of the electrification of Venezuela; and (b) the expansion of the electric services to extend the supply of power to zones not served by private enterprises.

The tariff policy of CADAFE pursues the following objectives in accordance with the aforesaid general principles:

(a) Growth of consumption: To serve the largest number of consumers as efficiently as possible is of course an aim that depends directly on the financial régime of an enterprise and the economic feasibility of its tariff system. In the first place, there is the problem of expanding the installations to those zones which have none and, in the second place, the incorporation of new users in the zones where such a service already exists. In planning the expansion of services, we were faced with the natural division between rural and urban markets and, within every classification, with the markets with either high or low economic returns. In general, the urban markets with high returns are served by private enterprises. The position of CADAFE in its dual role of national planner of electrification and of supplier of electric power is (i) to plan overall electrification on a long-term basis and in successive stages, taking markets with high or low returns as a whole and in conjunction with private enterprises; and (ii) to extend its services to zones with low returns and

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include those sectors of the population which still have no access to electric power - all in accordance with the programme mentioned before. The incorporation of low-consumption users has been helped by the introduction of the social tariff described in the previous chapter. The method of dealing with the problem of markets with different levels of returns has been flexible, owing to the fact that the territories served by CADAPE present very varied features and, on the other hand, because the interconnection of the different systems is just beginning, which prevents the use of any single criterion. In zones which produce small returns, we have adopted the policy of reducing the financial burden so that the prices are within reach of the consumers, even though we maintain the principle that the overall economic feasibility of the enterprise must be within the adopted limits.

(b) Consumption policy: One of the objectives of tariff policy is to direct consumption along lines that further the national interest and according to the economic and social aims outlined by the national Government. Tariffs should be fixed with due regard not only to the characteristics of the different types of consumption but also to their social usefulness. We think that the plans for industrialisation, agrarian reform and social progress that are being promoted at present in Venezuela, will find a definite source of encouragement in our tariff policy..

(c) Financing: The electrical industry must constantly expand to be able to serve adequately the incessant demands for electric power which the economic development of a community necessitates. The foremost problem as regards this expansion is financing, owing to the large volume of investment required in relation to annual income and the low returns. Next, the electrical industry has to establish within its financial régime certain favourable conditions so as to attract capital at the same time that it has to serve the public interest.

A sound financial policy of an electricity service should aim at self-support, the attraction of private savings and the use of long-term loans. Of course the principle of self-support, besides helping to finance by means of the re-investment of an enterprise's own funds (profits and depreciation reserves), fulfils the important function of creating a

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favourable climate for attracting private capital and long-term loans.

The financial stability attained as a result of this principle should be such that under no circumstances whatsoever should it be necessary to resort directly to a Government subsidy.

The attraction of private capital does not diminish the role of the State enterprise in any way. On the contrary, not to resort to this capital would be to deprive the other public services, which are not productive in the sense that they produce no direct profits, from the only source of capital to which they can apply, namely, national funds.

With the object of achieving the aims mentioned, the tariffs of CADAPE are worked out on the following lines:

(i) Cost of service: Rates are to be fixed so that they will produce an income which is adequate and sufficient to cover the following components of the economic cost:

All the costs of operation, maintenance and administration, including salaries, wages, fuel, materials, insurance, rents, patents, intangibles, etc.

Provision for the recovery of capital (depreciation and obsolescence)

All legal requirements, taxes, social insurance payments, etc.

Interest and amortization of long-term obligations

Profit or capital returns;

(ii) Reinvestment of own funds: The company's own funds (depreciation reserves and profits withheld after contributions are made to legal reserves) are to be considered as a source of financing for the expansion of services and reinvested in the company;

(iii) Basis of tariffs: Many opinions have been expressed on this question and there seems to be no end to the existing controversy between those who maintain that the "original value" should be taken as the tariff basis and those who propose the "fair value" or "replacement value".

In the case of CADAPE, owing to the fact that the larger part of its investment has been made recently, the "original value" and the "fair value" can be regarded as more or less comparable.

However, since we are stating a policy that will possibly be used in future circumstances which cannot be foreseen today, the concept which we

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adopt to determine the tariff basis should be founded on the soundest financial criterion. The criterion of the "fair value" leads to very involved and controversial proceedings but, on the other hand, the "original value" does not take into consideration the economic fluctuations which affect investment in the electrical industry. Our position is that the "tariff basis" must reflect the present value of investment but that the procedure adopted should be studied on a national scale, probably by a State organization.

(iv) Rate of capital return: The determination of an adequate rate of return is complicated. Many factors must be taken into account, principally capital needs for a more or less long period, the financial structure of the enterprise, the conditions of the money market and the revenue potential of the different areas being serviced. A rate of return which appears reasonable over a given period may be inadequate if the general conditions are changed.

The financial structure of CADAPE is very simple. Its capital is constituted by the contributions which the Government makes through the Venezuelan Development Corporation (Corporación Venezolana de Fomento) as part of the national budget.

Basing our views on the general situation of the securities market in Venezuela, and taking into consideration the fact that the rate of return of a State enterprise must be at least equal to the interest which the Government pays on its loans, we have adopted a rate of not less than 6 per cent after taxes are paid.

3. Principles and methods for establishing rates

The electricity consumer usually has difficulty in understanding the rates, and sometimes the enterprises do not attach enough importance to their operation and characteristics, with the result that inadequate tariffs are established which lead to inefficient services - to the detriment of the consumer, the enterprise and, ultimately, to the national economy.

The origin of these difficulties is to be found chiefly in the nature of the tariffs, arising directly from the special characteristics both of

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the technology and of the economic structure of the electrical industry.

In considering tariffs, the adoption of an adequate and clear-cut policy is a sine qua non. The following are, in broad outline, the basic factors which we have taken into consideration in preparing our tariffs:

(a) Loads: A complete understanding of the characteristics of the loads supplied by an electrical enterprise is the first step in a study of tariffs. Load analysis is intended to provide the following information:

- (i) Evolution and projection of demand;
- (ii) The system's load and operational characteristics;
- (iii) Units of service (number of consumers, maximum demand and energy consumed) and load factor and variations for each consumer group according to the voltage levels of the service.

(b) Costs: We consider costs only as a guide in establishing price levels and not as a determinant of tariffs, as the prices ought to reflect the influence of other factors as well.

The study of costs is based on the following concepts:

(i) Each group of consumers should participate in the distribution of costs without discrimination of any nature in spite of what might be finally decided from the point of view of price;

(ii) The cost of supplying electricity is made up of three elements: demand, consumers and power. The first two are related to the capacity of the installations, consisting mainly of fixed expenses, and the last to the operation of the installations, consisting of variable expenses. The cost under "demand" depends on the capacity of the available installations; the cost under "consumers" on that part of the distribution network which serves the customer directly, such as service connection meters etc., and the services of reading, invoicing, collecting etc.; the cost under "power" on the quantity of kWh supplied and, principally, on the cost of fuel.

Cost analysis consists in grouping the costs, classified according to their components, at the different levels of the process of electric supply and, generally speaking, the procedure is as follows:

- (i) Economic and financial analysis: Its object is to determine the /situation of

- situation of the enterprise and its financial requirements;
- (ii) Adjustment of investment, annual expenses and income: The respective accounts are adjusted to help determine costs;
 - (iii) Distribution of investment and annual expenses among the cost components and according to voltage levels: Each portion of investment and annual expenses is assigned to the voltage level to which it belongs and distributed among the cost components so as to obtain the cost under "demand", "consumers" and "power".
 - (iv) Determination of the cost formula: The cost formula, which consists of the unit costs under "demand", "consumers" and "power", is determined by dividing the values of the cost components obtained at the previous stage by the "service units" at the respective level. The unit investments are obtained in the same way. In determining service units the power losses and internal consumption should be taken into consideration.
 - (v) Determination of costs for each consumer group: The portion of costs corresponding to each consumer group at its respective voltage level is obtained by multiplying the unit costs of the cost formula by the service units corresponding to each group. The investment for each group is determined in the same way.
 - (vi) Determination of the "rate of profit" and of the "margin of income" of each consumer group: Once the cost and investment corresponding to each consumer group and the income are obtained, it is possible to ascertain the rate of profit and the surplus or deficit for the group.

(c) Price: Having obtained the costs for each consumer group, there is only one method of establishing the tariffs. The following stages consist of an analysis of the factors and considerations which really determine the price. These factors and considerations vary widely from the purpose of the tariffs to public relations considerations, including financial, commercial, technical, legal, geographical and, above all, economic aspects such as price trends, market conditions, the frequency of consumption, etc.

We consider that, in preparing tariffs, the relationships between
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the technical, economic and financial factors affecting the electrical industry should be taken into account, and that, consequently, the study of tariffs has to be based on a very careful analysis of those factors. A study of tariffs which takes into consideration, for example, only the financial and book-keeping aspect and ignores the economic and technical side, will not fulfil the necessary requirements for establishing rational and satisfactory tariffs for the consumer and the enterprise.

We maintain that the fixing and administration of tariffs are of capital importance as much for the electrical industry as for the economy of a country, and therefore that the policy and the method of drawing up tariffs should receive the greatest attention on the part of enterprises and regulating organizations.

