
This article provides a brief historical description of the electricity sector in Mexico and its regulation, a consideration of the implications of the North American Free Trade Association for that sector, and a brief discussion of the effects of attempting to introduce competition into electricity industries.

Cet article fait brièvement l'historique du secteur de l'électricité au Mexique et de sa réglementation. Il considère les implications de l'ALENA sur ce secteur et discute brièvement des conséquences de la tentative d'introduire la concurrence dans le secteur de la production d'électricité.

Electric Power Regulation in Mexico

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The Mexican Electricity Sector

Electric power supply systems were developed in Mexico during the last quarter of the nineteenth century by private companies, which eventually consolidated into two foreign-owned groups. Government regulation of this industry was instituted in the 1920s. In 1926, the Federal Executive issued the National Electricity Code. Two years later it came forth with corresponding rules and regulations, which, together with the Public Ownership Waters Law issued in 1929, granted the Federal Government the power to rule, regulate, and oversee electricity supplies. The electric power industry was declared a public service. The granting of concessions for electricity generation by hydraulic and thermal means was also regulated. Concessions were to be granted for a period of 50 years, and were renewable.

On August 24, 1937, President Lázaro Cárdenas issued a law, based on previous regulations, creating the Federal Electricity Commission (Comisión Federal de Electricidad), the goal of which was to organize and direct a national non-profit electricity generation, transmission and distribution system to be operated at minimum cost. A 10% tax rate on electricity consumption was established in order to help finance the Commission's development.

The Federal Electricity Commission ini-

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tially grew at a very slow pace. During its first period — from 1937 to 1960 — it coexisted with private electric power companies. These were mainly the Impulsora de Empresas Eléctricas, a subsidiary of a North American corporation, the American and Foreign Power Company, and the Compañía Mexicana de Luz y Fuerza Motriz (Mexican Light and Power Company), the head offices of which were based in Canada. The Avila Camacho administration renewed the concessions of the latter when they were on the verge of expiring, thus favouring the initiation of a plant extension program.

In that period, electric power tariffs were based on average costs. A tariff commission, dependent on the Federal Executive Power, was responsible for sanctioning electricity rates, which were based on the average cost of the electric utility's total production, so that sales revenue would cover the total costs of operations, maintenance and management, as well as investment in new plant, depreciation of existing infrastructure and reasonable returns to invested capital.

The average cost, however, was not applied to all consumers equitably, but rather varied according to a variety of criteria. For instance, electric power was sold to captive consumers who could not do without it at prices well above average cost and discounted prices were given to consumers who could opt for other more economical sources of energy.

In 1960, the Federal Government purchased the Implulsara de Empresas Eléctricas, as well as most of the shares of the Mexican Light and Power Company. That same year, Congress approved the following addendum to Article 27 of the Mexican Constitution as proposed by President López Mateos:

It is exclusively a function of the Nation to generate, conduct, transform, distribute, and supply electric power which is to be used for public service. No concessions for this purpose will be granted to private persons and the Nation will make use of the property and natural resources which are required for these ends.

Based on this constitutional amendment, a

new Electricity for Public Service Law was passed in 1975, replacing the 1938 law. The Secretariat in charge of the energy sector was given control over the nationalized electricity sector, made up of the Federal Electricity Commission and the Central Mexican Light and Power Company.

Although the setting of electricity tariffs was still formally to be based on average costs, they in fact were increasingly influenced by national economic policy objectives. Low-income and agricultural consumers, for example, were subsidized, and, in general, tariff increases were limited in order to control inflation and promote industrial development.

The Mexican electricity sector has not been quick to adopt innovations in pricing that are seen to contribute to cost efficiency. In the 1950s, the state-owned electricity company in France developed tariffs based on marginal costs, in order to have rates that were efficient from the viewpoint of the whole society. These rates take account of cost differences depending on the time at which electricity is supplied. Because electricity cannot be economically stored in large amounts, generating systems must be capable of immediately adjusting to user demand, which varies considerably in patterns determined by daily, weekly and yearly activities, and by seasonal changes. This means that the cost of generating electricity also varies with these patterns, and this justifies differentiated electricity prices depending on when the consumer requires electricity, so that prices reflect production costs. Through rates based on marginal costs, the consumer is supplied with information that allows adjustments of consumption across time periods. This can contribute to improving the shape of the utility's load curve and to reducing the investment in generating plant that the electricity company must make. Until very recently, such tariffs were not seriously applied in Mexico. Now, many electric power companies have a tariff structure based on marginal costs, adjusted so that overall average costs are covered.

Effects of NAFTA

The North American Free Trade Agreement (NAFTA), between Canada, Mexico and the United States, has introduced some innovations into the regulation of the Mexican electricity industry, basically concerning the possibility of setting up and operating private electricity production plants in Mexico. These changes can be traced back to developments in the US, themselves resulting from difficulties experienced by the US electricity industry in the 1970s and, more recently, the policy of introducing elements of competition into an industry which up to now has been viewed as a natural monopoly, and allowed to operate as such by governments.

The NAFTA provisions on electricity were not consistent with the Electricity for Public Service Law in force up to December 1992, nor with the contents of Article 27 of the constitution, which stipulates that "it is exclusively a function of the Nation to generate, conduct, transform, distribute, and supply electric power which is to be used for public service."

On November 16 1992, in an effort to conciliate this contradiction, the Executive launched a bill to amend the Electricity for Public Service Law. It was to solve the problem by rewriting Article 3, which had previously stipulated that "electricity supplies to fulfill private requirements, individually considered, are not considered to be a public service."

The text finally passed by Congress in December 1992 includes the following:

Article 3. The following are not considered public services:

- 1) electric power generation for self-supply, cogeneration or small-scale production;
- 2) energy generation effected by independent producers to sell to the Federal Electricity Commission;
- 3) electric power generation for export, derived from cogeneration, independent production and small-scale production;
- 4) electric power imports by private persons or societies for their exclusive use; and
- 5) electric power generation to be used for emergencies due to public service electricity

supply interruptions.

Article 36. Considering the national energy policy criteria and guidelines and in response to the opinion of the Federal Electricity Commission, the Energy, Mining and Semi-Official Industries Secretariat is to grant electricity self-supply, cogeneration, independent production, small-scale production or import/export concessions, whichever is applicable, under the conditions pointed out for each case.

Regarding imports and exports, according to provisions of Parts 3 and 4 of Article 3, the specification in Part 5 of Article 36, the part most relevant in the present context, is as follows:

The following must be observed in granting the permits this article refers to:

- 1) The authorized exercise of the activities referred to in this Article may include electricity transmission, transformation and supply, according to the specificities of each case. ...

The new provisions on electricity exports included within the Electricity for Public Service Law are less stringent than those of NAFTA since they do not require the intervention of the Federal Electricity Commission, while NAFTA provisions do. This may lead to the establishment of extensions of the electricity systems of North American companies into the Northern border areas of Mexico. These plants would not be connected to the Mexican electricity network and could place national sovereignty at stake.

In fact, electricity companies in the south of the US may well be interested in establishing generation plants in Mexican territory in order to take advantage of the economic benefits of more friendly environmental laws and thus export electricity by connecting their plants to their systems in the US through their own transmission lines, as has been authorized by the above-mentioned Article 36.

On the other hand, under present conditions, electricity systems in the southern US and Mexico cannot interconnect, as was pointed out by Fernando Hiriart during his appearance at the Energy Commission of the Chamber of Senators on December 2 1992. This

is due to technical problems related to the monitoring of electricity frequency, supply stability and short-circuit capacities. American electricity plants in Mexico would thus be completely independent from the Mexican electricity system.

The amendments introduced to the Electricity for Public Services Law enable the participation of the private sector in electricity generation for public services, as appears in Article 36:

The lowest cost electricity production for the Federal Electricity Commission must be used for the provision of public service electric power. It must also offer the most favourable stability, quality and public service security. The following factors must be observed:

- 1) Based on the national electricity system elaborated by the Federal Electricity Commission, the Energy, Mining and Semi-Official Industries Secretariat will determine the growth needs or the substitution needs of the system's general capacity.
- 2) When the above-mentioned plans require the construction of new electricity generation plants, the Federal Electricity Commission will report the characteristics of the projects of the Energy, Mining and Semi-Official Industries Secretariat's projects. Based on comparative costs criteria, this office will determine whether the plant will be built by the Federal Electricity Commission itself or whether a bidding process among private firms should ensue in order to supply the necessary electric power.

Another of the provisions of this law which may contribute to privatizing certain parts of the electricity system is one that extends the concept of self-supply, as stipulated in section I, Article 36:

Electric power self-supply destined to fulfill the needs of private persons and societies [is allowed] so long as the Energy, Mining and Semi-Official Industry Secretariat does not rule it inconvenient for the country. The following prerequisites must be fulfilled in order to grant a permit:

- a) When different applications are received for self-supply from the same electricity source, they will be considered co-owners and will thus create an association, the object of which is to generate electricity in order to provide for the self-supply

requirements of the members. The licensed society will not be allowed to supply electricity to third parties, whether they be private persons or societies, not included within the association when the original project was approved, together with its expansion plans, except when cession of rights is authorized or the above-mentioned plans are modified.

Competition in Electricity Industries

Turning to changes in electricity supply industries at a more general level and in many countries, the introduction of competition into industries that had previously been operating as monopolies means that market mechanisms will be applied to increase efficiency and reduce costs. The attempt to create a free electricity market has two main objectives: to open this market to potential producers and to allow consumers to freely purchase electricity from suppliers. However, since generation plants and consumers are connected by a transmission network, a free electricity market would imply free access to this network. This leads to a de-integration of the three functions of the electricity systems: generation, transmission and distribution, which historically had tended to integrate vertically on a regional basis, thus creating a monopoly.

The technical characteristics of electricity systems based on alternating current and the need to optimize overall operation in order to improve service quality have encouraged the trend towards vertical integration. For years the electricity industry operated with decreasing marginal costs, which was the basis of the natural monopoly for electricity, since this hinders access by potential competitors. During the 1970s, this situation changed in many countries as a result of the oil crises and fuel cost increases, but also owing to the increase in costs due to more stringent environmental regulations and the decrease in demand growth caused by energy conservation policies.

We might be returning to a situation of decreasing marginal costs, caused by the improvement of more efficient and flexible

technologies, such as combined-cycle generation, and the introduction of policies to eliminate subsidies previously provided by public electricity companies to certain types of consumers. Such subsidies occurred to help control inflation or to support a national electricity industry, as was the case in the UK before privatization, when electricity producers were forced to use domestic coal.

Opening electricity systems to some degree of competition raises questions about long-term effects in regard to service quality, efficient energy use, and environmental impact.

The crucial importance of conservation and efficient energy use, along with increasing concerns for the environment is having a decisive impact on the development of electricity systems. This is expressed in particular through the following factors:

- cooperation between electricity companies and consumers on energy conservation measures and more efficient technologies for the end use of electricity;
- the promotion of cogeneration in cooperation with industrial consumers;
- the introduction of new electricity generation technologies which may reduce environmental impact;
- integrated analysis of the supply of and demand for electricity in the planning of electricity systems.

Where these changes in the activities of electric utilities occur, they have repercussions on organization and operation. In the United States, for instance, utilities are often viewed as being not only in charge of supplying electricity with the appropriate quality and the lowest cost possible, but are also service companies promoting and supporting efficient electricity use and environmental conservation.

This kind of transformation may not be compatible with eliminating or reducing the vertical integration of electricity companies. It should be noted that so far this de-integration process has not been taking place in the US, nor in most other developed countries. In countries where it is occurring, such as the UK and Chile, it is at an experimental stage, the results of which are not conclusive.

There is no evidence either that the introduction of competition will ultimately reduce the stringent regulation that currently rules the electricity industry in many countries; on the contrary, it might well reinforce and expand this regulation. Lastly, we should not overlook the technical restrictions that will constrain the response to any push for free access to the transmission network.

Thus, recommendations to de-integrate the vertical organization of electric companies must be viewed with reservation. This is evident, for instance, in a change in the position of the World Bank, which originally had enthusiastically promoted the de-integration of electric utilities in developing countries; it now seems to be moderating its stance. An article, significantly titled 'Power Supply in Developing Countries: Will Reform Work?', (World Bank, 1993) containing information about a meeting jointly sponsored in 1993 by the World Bank and Electricité de France, states:

Underlying these debates are questions that remain largely unresolved, concerning the possibilities of applying and generalizing to developing country power sectors certain recent advances in economic theory. Many of the new ideas for sector reform draw on contestable market theory, arguing that the focus on electric power as a natural monopoly may have been overstated. Although certain components of electric power supply (e.g., transmission) do continue to exhibit natural monopoly characteristics, others may be better suited for competitive arrangements than has been previously thought.

In response, strong arguments remain in favour of maintaining the emphasis on economies of scale and scope, particularly in developing countries. When a power sector is vertically de-integrated and/or opened up to competitive generation and distribution arrangements, increased transaction costs may offset the possible efficiency gains.

In my view, though vertical integration (which has great technical advantages) should be maintained, independent regional generation firms should be tried out, so long as they prove competitive in respect to the excessively centralized integrated electricity

industries at a national level. Separate accounts for generation, transmission and distribution activities should also be encouraged.

In addition, regulatory functions should be separated from operative functions and allotted to different agencies. It also seems suitable to allow the participation of private capital in electricity industries that are now in the public sector in order to facilitate investment and improve the operation of public

utilities by subjecting their performance to commercial criteria.

References

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