The electric field in the Argentine Republic has gone through profound regulatory changes since the passing of Act 24065 in the year 1992. Prior to that date, there was a system in which energy prices were set by the state, conformed by companies in the transmission, generation and distribution activities owned by the national and provincial states. Changes were mainly originated by the privatisation of such companies generating the vertical and horizontal disintegration of the activities and the subjectivity of energy prices to offer and demand. Within this context, the transmission network expansion projects, which were previously planned through a centralised system and financed by the state, became subject to market decision, as regards both their planning and financing. This change in the electric field model brought about very good results, mainly reflected in a significant energy price reduction and in the generation renewal and expansion. However, this significant progress was not followed by a suitable development in the transmission system, neither in the high voltage (500 and 220 kV) nor in the trunk Distribution Transmission. It is exactly on this aspect that the main flaws of the model are made evident, since neither the regulations applied since 1992 nor the subsequent adjustments and modifications have produced sufficiently effective economic signals to promote the corresponding market activity. This paper describes the main difficulties found for the development of transmission network expansion projects in Argentina, particularly focusing on their impact on the Distribution Business since these companies must guarantee the energy supply in their concession areas according to the quality standards set by the conceding authority. We are also proposing a solution to the problem by separating the problems found in the expansion of the high voltage transmission network from the ones affecting the trunk distribution transmission network. For the high voltage transmission network the proposal objectives are as follows:

- Conciliate the interests of the parties involved, which are: the National State, the High Voltage Transmission Company, the Distribution Companies and the large Customers in the Wholesale Electrical Market, to develop a Long Term Strategy Plan.
- Provide a mechanism to finance the aforementioned Strategic Plan.

For the Trunk Distribution Transmission Network we propose:

- To produce the Regulatory modifications to enable the possibility of voluntary vertical integration of Trunk Distribution Transmission Companies with Distribution Companies under the figure of a Distribution Company.
- Consider in the Distribution Companies tariff mechanism the costs of Distribution and Transmission network operation, maintenance and expansion.
EXPANSION OF THE ELECTRIC ENERGY TRANSMISSION SYSTEM IN ARGENTINA. IMPACT ON THE DISTRIBUTION BUSINESS. NEED FOR REGULATORY CHANGES.

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1. INTRODUCTION
The National Regulations state that Concession Companies of the Electrical Energy Transmission System (STEE) are only required to operate and maintain their installations.

The users of such system are required to pay for any expansion works that are necessary to satisfy increases in demand.

This situation has a strong economic impact on the companies that use such system, especially Electrical Energy Distribution Companies.

We see weaknesses in the signals that the Regulatory regime provides to the Electricity Market to encourage such investments. Likewise, certain “gaps” in National and Provincial Regulation justify the lack of initiative of the electricity market agents to invest in the development of the Transmission System.

2. GENERAL OBJECTIVE:
To offer a different view of the relationship between Electricity Distribution Companies and the Transmission System than the one currently supported by regulation.

2.1. Specific Objectives:
2.1.1. To identify regulatory weaknesses as regards the inability to support and finance STEE expansion projects, so as to meet a reasonable criterion of quality of service and reliability.
2.1.2. The economic impact of transmission projects on the electric energy distribution companies.
2.1.3. To propose changes to foster the expansion of the High Voltage National Transmission System, following a strategic development perspective.
2.1.4. To propose a change in the operation of the Electric Energy Transmission Business at lower voltages.

3. ANTECEDENTS & CURRENT LEGISLATION.
The electric sector in Argentina has gone through a radical change since 1992 with the enforcement of Act 24065, which required the separation of the Generation, Transmission and Distribution activities. Transmission and Distribution are considered public services, whilst Generation is an activity of general interest associated with the aforementioned services. Transmission and Distribution are concessions with regulated tariffs whilst Generation is organised as a risk activity subject to market conditions.

The expansion of the Transmission System, before 1992 was based on centralised strategic planning carried out by the National Government for the High Voltage Transmission Networks (220 & 500 kV systems) and by the Provincial Government for the lower voltage transmission networks within their respective jurisdictions.

As a result of the enforcement of Act 24065 and its complementary resolutions, the Electricity Transmission Public Service was awarded as a concession to the High Voltage Electric Energy Transmission Company for different electrical regions of the country. The Public Transmission System within the same electrical region was given to different Electric Energy Transmission Companies through trunk Distribution. The expansion of the transmission system depends on the market, and it is the users’ responsibility (Generators and Demand) to decide what projects were necessary and to finance them. The Transmission Company is responsible for the production of a document called The Transmission System Reference Guide. It must provide its view on expansion needs and the necessary projects to be carried out, establishing indicative planning with no obligation of compliance by the other parties in the market.

4. EVOLUTION OF THE TRANSMISSION SYSTEM AFTER THE INTRODUCTION OF ACT 24065:
Since the Regulatory changes in 1992, The Electrical Energy Transmission System in Argentina has not, been developed to meet the requirements imposed by demand growth and the installation of new generators. This has resulted in a progressive reduction in the quality of service and necessitated the implementation of severe measures (automatic load and generation disconnection) to prevent the collapse of the system in cases of faults with high occurrence probability. For the last few years, there
has not been any significant expansion work, either on the high voltage transmission network or on the transmission networks through Trunk Distribution, and the existing network’s remaining capacity has been used. Therefore, the design conditions in respect of system reliability and safety have been changing.

On the other hand, the application of Act 24065 eliminated the role of the State as the planner for the expansion of the transmission system and as the executor of the necessary projects. From the strategic viewpoint, it caused the loss of a tool that fostered regional developments by the State and provide unified criteria for the system design. It is important to point out that, even though the Transmission Reference Guides provide general indicative planning, they contain the Transmission Company’s view only. Therefore, it makes them susceptible to the transmission companies’ interest in promoting their own business as a priority instead of promoting the shared interests of the electric market.

Another aspect to bear in mind, which we believe has delayed transmission expansion decisions (especially high voltage transmission), is the conflict of interests of the two main groups of users, the Generators and Distributors. The Generators are interested in achieving the greatest dispatch, therefore making the most intensive use of an eventual new link between them and the demand. They are less interested in anything related to the quality of service of the link, since they are only affected by the time that they cannot be dispatched. From the Distributors point of view, the focus is on the quality of service of the link, since they are penalised heavily for customer interruptions, even though they originate in the transmission network. More intensive use of the network puts them at a greater risk of interruption. And the eventual reduction of energy prices that such use could cause does not benefit Distribution Companies directly, as their tariffs are subject to a “pass-through” mechanism.

In short, the weak signals from the current Regulations have not fulfilled the purpose for which they were designed, as the necessary network expansion has not been made to meet the increasing demand adequately, and nobody has promoted any infrastructure work to provide the system with the necessary reliability. This is, without a doubt, the main flaw of the Regulations.

Last but not least, it is important to point out that the latest regulatory adjustment is evidence that the State acknowledges the need for changes, although the changes that have been made are hard to implement and will not have the desired effect. However, they do partially modify basic principles of the Regulations, as for example in the Resolution of the Secretary of Energy N° 208/98. This resolution enables the Transmission company to initiate works to guarantee the safety of the service, whereas previously, any initiative was in the hands of the users of the transmission system.

5. IMPACT ON THE ELECTRIC ENERGY DISTRIBUTION BUSINESS:

The electric energy transmission, both in High Voltage and Trunk Distribution, has a significant direct effect on the distribution business. The energy availability that enables the distributor to meet his contractual obligations of supplying his concession area depends on the capacity of the transmission system to which a distributor is directly or indirectly linked. On the other hand, the transmission system’s quality of service is as important as the capacity, since it has a direct impact on the quality of service that the distributor is obliged to supply to its final customers. Therefore, it is essential to have highly efficient mechanisms to promote the expansion of the transmission systems.

According to the current regulation in Argentina, the expansion projects on the transmission system must be made and financed by the user of the transmission system. And the regulatory authority, using a method that allocates beneficiaries called the “influence area method” distributes their depreciation costs. Most distribution concession contracts do not contemplate transmission network expansion costs in their tariff charts, thus such costs directly affect the business’ profitability, since they have to be deducted from the profits. It is important to point out that when the supply to an area requires investments on lines and substations of the transmission system at high voltage levels, they can be disproportionately high compared to the value of the distribution business.

Even though the regulatory conditions were known at the time of acquiring the concession of a distribution area, we must bear in mind that the concessions are usually awarded for very long periods of time. It is almost impossible for a Distribution Company to foresee the investment requirements on the transmission system for this period with the accuracy that would be required to undertake sound financial planning.

Another important issue, is the fact that the regulation in Argentina enables the free access to the remaining transmission capacity. This means that a transmission system investment does not grant the right to make a reserve over the remaining capacity, which can be freely used by any requiring agent. If this occurs during the depreciation period (up to a maximum of 15 years), the beneficiaries are recalculated considering the changes in the use of the expansion made. But once the payment has been completed, the remaining capacity is available for free access, to the agents who shared the project depreciation cost and the ones who did not.
6. PROPOSAL FOR REGULATORY CHANGE:

6.1. On the High Voltage Transmission System:

The proposal must try to re-establish objectives that were lost or minimised as a consequence of the current regulation. They can be categorised according to the interest of the agents involved:

For the National State:
♦ To have a reliable transmission system that covers a large geographic area whilst satisfying regional needs.
♦ To foster economic developments, encouraging productive activities that use the potential regional resources.
♦ For the expansion of the transmission system to respond to a long-term strategic plan, including projects that represent the optimal technical and economic solutions.
♦ To contribute to the rational use of the natural energy resources of the country.

For the Electric Energy Transmission Company:
♦ To have a system with sufficient remaining transmission capacity and transformation capacity reserve to satisfy the demand in all cases of N-1 type contingencies and even in case of more serious credible faults.
♦ For the Electric Energy Transmission System to be expanded according to the demand growth, in such a way that it always meets the design criteria.
♦ To maximise the availability of all the lines and equipment that are part of the transmission system, not only to provide a good service, but also to maximise the contribution.

For the Distribution Companies and the Large Customers in the Wholesale Electrical Market:
♦ For the expansion of the transmission system to respond to a long-term strategic plan, including projects that represent the optimal technical and economic solutions.
♦ For the companies economic contributions to the financing of long-term strategic plan projects to be within the technical and economic means of their respective business. Therefore, and in order to meet this purpose, it is necessary, but not sufficient, for the projects aimed at solving a transmission system congestion or a demand growth for one or several users of the system, to be suitable from the technical and economic viewpoints to the cause that motivated the project.
♦ For the Distribution Companies economic contribution to the financing of transmission expansion projects to be a component part of the price forming mechanism to define maximum tariffs for such companies.

In order to accomplish the aforementioned objectives we propose the creation of a technical work and discussion forum with the participation of:

♦ A representative from the Energy Secretary of the Nation.
♦ A representative from the Federal Energy Council.
♦ A representative from the High Voltage System Transmission Companies, selected from the association that represents them.
♦ A representative from the Energy Distribution Companies, selected from the association that represents them.

With the objective of: Producing a long-term Strategic Plan for the development of the Electric Energy Transmission System.

This plan would be contain projects:

♦ Proposed by the National State for the achievement of the aforementioned objectives, subject to the protection of public interest, economic viability and guarantees regarding the lack of subsidies to private sectors.
♦ Proposed by the Transmission Company, in charge of the National Concession for the Operation and Maintenance of the High Voltage Transmission System.
♦ Proposed by the Electrical Energy Distribution Companies, within the work environment of the aforementioned Forum and/or through private demand initiatives submitting "Project consideration Applications", in order to solve specific matters.
♦ Private initiatives from the generators, in order to achieve electric links between the generation power plants and the Transmission System, and/or reinforce and expand the existing links either with the transmission system or between the generator and the demand.

Payment and financing of Strategic Plan projects:

We propose the creation of a Trust Fund for specific use, similar to the one created by Resolution of the Secretaria de Energía y Minería Nº 174/2000 to support the financing of the Federal Plan Transmission Expansion Projects.

This Trust Fund will support all Strategic Plan approved projects with the exception of the ones originated by the generator’s initiative and those that are not considered by the Forum as of Public Interest and/or that represent a subsidy to the submitting generator.

The projects submitted by one or more Generation Companies destined to achieve the electrical link between the Generation Power Plants and the
Transmission System, and/or reinforce or expand the existent links either with the transmission system or between the generator and the demand, will not be paid nor financed by the Trust Fund, having to be supported by the heads of the generation project. In exceptional cases project financing may be considered where public interest can be demonstrated, no subsidy is implied for the benefit of the generator and, in the presence of both these conditions, whenever this financing makes the project viable. In such cases, the support of the project by the trust Fund will be limited to the proportional part of other Energy Distribution Agents and/or GUMAS\(^1\) that are declared beneficiaries of such project. The contribution from the generator (Reimbursement to the Trust Fund of the percentage amount to be paid for by the generator) will be collected through a proportional charge to the energy dispatched by such generator, establishing convenient payment guarantees and peremptory terms.

For the payment and financing of the Strategic plan projects, other complementary mechanisms can be used in addition to the Trust Fund such as the SALEX\(^2\) accounts, as pertaining.

**Trust Fund Composition:**

- Taxes will be charged to users of the National transmission System as a percentage of the energy operated by each of them. In order to do that, the scope of the current contribution charges to the Federal Plan Trust Fund for the expansion of the Transmission System can be modified.
- Economic contributions made by generation companies aimed at financing the projects proposed by generators and financed by the Trust Fund.

**Agreement Mechanism:** The members of the Forum guarantee the representation of the main Wholesale Electrical Market members with interests in Energy transmission. However, in order to accomplish greater transparency in the procedures as well as to optimise the mechanisms of opinion, support and/or opposition to the project initiatives and to the Strategic Plan it is useful to have a Public Hearing to discuss not only each of the projects in the Plan but also the Plan itself. The idea is for the Public Hearing to confirm the Strategic Plan, consolidating the compliance with the aforementioned objectives based on the commercial certification of the projects that are part of it.

Individual projects will be presented at the Public Hearing to consider the particular problems in agreement with the standards in force.

### 6.2. For the Trunk Distribution Transmission:

The Electrical Energy Transmission activity is divided in two areas, the one indicated as “High Voltage Transmission” and the Trunk Distribution Transmission that is defined as follows:

“The Transmission of Electrical Energy within the same Electrical Region and its link to the Electrical Energy Transmission System at high voltage (High Voltage Transmission), is named Electrical Energy Transmission System by Trunk Distribution (Trunk Distribution Transmission). This includes Transmission Installations at 132 kV or greater and lower than 400 kV. This public service is granted as a concession to Trunk Distribution Transmission Companies (DISTRO) in the terms of Act N° 24065”\(^3\). Normally these companies perform their activities in the geographical environment of the Provinces.

The regulatory framework put into effect in 1992, generated a horizontal and vertical disintegration of the generation, transmission and energy distribution activities.

The vertical disintegration is justified in order to avoid economic power concentration, bureaucratic operation and monopolies, especially with the companies going into private hands. Also and very importantly, to create competitive conditions.

The horizontal disintegration of each vertically separated activity was expected to generate competition by comparison.

Even though the regulation in force achieved totally or partially the objectives foreseen by Act 24065, there is no evidence that the vertical disintegration of the Trunk Distribution Energy Transmission activity contributed to the achievement of objectives. Similarly, there is no evidence that the integration of these sections would generate effects that are contrary to the efficiency of such activities. On the contrary, such integration will enable the recovery of benefits of scale similar to those already achieved by Private Companies (in opposition to the experiences of the National and/or Provincial State Owned Companies).

In essence, this proposal consists of the modification of the National and Provincial Regulatory framework to allow for the vertical integration of the Trunk Distribution Transmission Company and the Distribution Company regulated by a modified Distribution Company Concession Contract.

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\(^1\) GUMAS: Large Major Customers, Wholesale Market Agents.

\(^2\) Isson SALEX: Accounts of surpluses due to restrictions in Transmission capacity – The Procedures……

\(^3\) Of “The Procedures to program the Operation, load dispatch and Price calculation – Annex 19.”
Any suge integration should be by the agreement of both parties (not compulsory). Should this become effective, the trunk distribution transmission activity would not longer be regulated, in the specific geographic area, by the National Standards but regulated by the authority who awarded the Distribution Concession to the pertaining private company.

The main advantages of such vertical integration can be summarised in two main aspects:

♦ Recover economies of scale and, through that, improve final customer tariffs.
♦ Consider, as part of the Distribution tariffs price forming mechanism, the costs of operation, maintenance and expansion of the transmission and distribution systems of the new integrated Distribution Company, together with the already recognised commercialisation costs for use of the high voltage transmission system and the energy cost. This guarantees that the Distribution activity will generate the necessary economic resources to meet the growing demand with the quality conditions required in the Concession Contract to the Electrical Energy Distribution Company.

7. CONCLUSION:

It is believed that the proposals prepared for both areas of the Electrical Energy Transmission activity will enable rational development of the electric al transmission infrastructure. The proposals constitute a simple, clear and efficient signal to encourage the expansion of the system and its operation under reliability and quality conditions in agreement not only with the Concession Contract requirements but most importantly with the requirements of the Electric Energy Consumers Market. The proposals will eliminate standards that are difficult to interpret and have questionable or null effect, as demonstrated by the insensitivity of the Electricity Market towards them.

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