THE POWER SECTOR IN: ARGENTINA

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I. Current Status of Sector Reform: Key Points	
Power System Overview	By the end of 1998, Argentina had an installed capacity of 23,470 MW with a total electricity generation of 68,128 GWh during the year. Electricity consumption in that same year was 64,711 GWh growing 5% from the previous year. Planners expect electricity demand will continue to grow at the same average annual rate during the next decade. The capacity additions contemplated for the coming years are mostly thermal, using natural gas-fired plants. Electricity service covers around 95% of the total population, but the level of electrification in isolated areas is only around 70%. The MEM (Mercado Eléctrico Mayorista) is the largest system in the country with a total installed capacity of 18,899 MW in 1998. The MESM (Mercado Eléctrico Mayorista del Sur de Patagonia) operates the southern region and had an installed capacity of 841 MW in 1998.
Structure	The electricity sector in Argentina is almost completely unbundled with a large number of generation, distribution and transmission companies competing for the different markets. The largest private generation company is the Piedra del Aguila Hydroelectric project (1,400 MW) with less than 8% of the total national market. There are a number of transportation companies that contract their services with the MEM for a specified fee. The distribution companies operate under concession, with the companies serving the Buenos Aires region accounting for more than 44% of the total market. There are ownership restrictions intended to avoid the exercise of market power. Generation companies that hold distribution assets are limited to own less than 10% of the generation capacity. In addition, the generation companies are not allowed to hold transmission assets with the exception of internal expansion projects.
Competition	The wholesale electricity market in Argentina is highly competitive, with an increasing participation of deregulated retail customers. In the monopoly areas, such as distribution and transmission, concessions are awarded via a process of competitive bidding.
Role of the State	With the exception of the binational projects, such as the Yacyreta hydroelectric plant, and the national nuclear generation enterprises, the federal government has moved away from commercial activities in the electricity market. The government has restricted itself to policy and regulatory/oversight activities, with separate agencies in charge. Since Argentina has a federal system of government, many of the provincial governments have created their own policy-making and regulatory entities and are moving away from commercial activities.
Regulatory Institution	The Ente Nacional Regulador de Electricidad (ENRE) is in charge of the regulation for transmission at the national level, and for distribution activities in the Gran Buenos Aires area. The Energy Secretariat (SE) is in charge of overseeing the competitive behavior of the wholesale market in coordination with the market administrative body (CAMMESA). The entities are rather independent and have reached a good degree of consolidation. Some provinces are still in the process of creating their own regulatory bodies, which has delayed the implementation of the market rules. Both ENRE and the provincial governments will move forward in the consolidation of these regulatory activities.
Private Sector Participation	The sector is predominantly in the hands of private enterprises. National (except nuclear) and eleven provincial electric enterprises were privatized in 1992-1996. Argentina's binational generating assets and at least four of the twelve provincial utilities remaining in public hands are expected to be privatized. There is no restriction on private sector participation in any commercial sector activity.
Major Outstanding Issues	1. The handling of the1998 blackout that occurred in Buenos Aires and the corresponding fine to EDESUR has put the privatization process in Argentina under scrutiny. The most important issues raised were those related to the nature of the overseeing and regulatory activities required for ensuring the quality of service provided by concessionaires. Among them are the pre-qualification processes for companies bidding for a concession, and the enforcement of the overseeing and penalty

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	process, the availability of sufficient incentives for companies to improve their quality of service. 2. Some concerns have been raised regarding the reintegration of the markets in both horizontal and vertical terms. The acquisition by Endesa Spain of Endesa Chile increases the position of these two companies in Argentina. On the other hand, the merger between natural gas companies represents a significant threat; since these companies hold also generation assets, that may position themselves advantageously in an almost glutted and highly competitive market. 3. The incentive process to promote new investments in transmission is being revised. There is considerable concern that transmission tariffs are not giving correct market signals to promote new investments in transmission capacity, and thus the system is experiencing some confusion as to how expansion projects should be prioritized, carried out, and their costs allocated. 4. Implementation of reforms at the provincial level have not been as widespread or as rapid as the federal government and multilateral development agencies (MLAs) would have liked, although half of the provinces have now achieved reforms. 5. The Congressional approval process is likely to delay the privatization of binational generating entities, involving legislators or legislation in Uruguay and Paraguay as well as in Argentina, and of the reorganized commercial nuclear enterprise. 6. The Government's continued participation in CAMMESA is seen by some private participants as increasing the risk of arbitrary decision-making within this body, due to its veto power. 7. Low prices at the generator level have also caused concern about the financial health of generators and the veracity of market signals in the existing system, but new investments in generation have not been deterred.
II. Legal & Regulatory Framework	
Legal Basis	*Law No. 23696* (1989*), The Law of State Reform,* directed the Executive office to reorganize and privatize public enterprises. *Decree No. 634/91* (1991*),* issued by the Ministry of Economy, implemented Law No. 23696. It provided the guidelines for unbundling electricity sector activities, and for private participation in generation, transmission, distribution, and dispatch activities. It also defined the rights and obligations of providers of each area of service, directed the establishment of a new sector regulatory entity and of the bulk power market including a spot market, and outlined the privatization schedule and plan for the sector. *Law No. 24065* (1992*), The Electricity Regulation Act,* was the keystone for the ambitious reform and privatization of the sector. It restructured and reorganized the sector, and provided for the privatization of virtually all commercial activities that had been carried out by federally owned enterprises. It established the basis for the Regulatory Entity and other institutional authorities in the sector, the administration of the wholesale power market, pricing in the spot market, tariff-setting in regulated areas, and evaluating assets to be privatized. *Resolution 38/91, SEE,* established rules for the Wholesale Electricity Market (MEM). *Various Resolutions* (1991-1992*)* issued to implement particular components of the reform.
Role of the State	The federal government has restricted its participation in the electricity market to the regulatory, oversight and policy making activities. These activities have been assigned to different agencies, which have a close working relationship and sometimes even overlap in their responsibilities. The federal government has limited its holdings in the commercial sector to the operation of the international hydropower project and to the nuclear plant. About half of the provincial authorities are likewise creating separate policy-making and regulatory entities for the sector and divesting commercial interests.
Institutional and Regulatory	The **Ministry of Economy, Public Works and Services** (MEyOSP) is the designated government cabinet in charge of the energy sector.

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Entities and Jurisdiction	Under MEyOSP, the **Secretariat of Energy** (SE) and the **Under-Secretariat of Electricity** make national energy policies and define dispatch criteria for the bulk power market (*Mercado Eléctrico Mayorista* or MEM). The SE is also in charge of overseeing the electricity sector and to propose the changes needed in the market. The **National Regulatory Entity for Electricity** (ENRE) defines the technical, safety and operating standards, and determines the basis for and approves tariffs for the sector's transmission and distribution enterprises. It supervises the compliance of regulated transmission and distribution entities with established laws, regulations, and operating criteria, including quality of service and environmental standards, and guards against monopolistic behavior in the market. It also undertakes the resolution of disputes in the sector and protects consumer interests. The five Commissioners appointed to ENRE for five-year terms are selected through a competitive process after which the SE and the Federal Electricity Council (CFEE) nominate them for Congress' approval. At least parts of its budgetary requirements are funded through fees from sector enterprises, and its professional staff is competitively hired. The **Wholesale Power Market Administrative Company/Compañía Administradora del Mercado Mayorista Eléctrico S.A.** (CAMMESA) is a corporation in charge of the administration and coordinated operation of the MEM according to established guidelines. Its members are the national government and four associations representing the generators, the transmission companies, the distributors and the marketers. Many of the provincial governments following the privatization path in the sector have recently established or are in the process of establishing their own (more-or-less) politically and financially independent regulatory bodies at the provincial level. Previously, the utilities themselves had played a major role in making sector policies and setting tariffs for the provinces.
Sector Planning	Due to the characteristics of the power market in Argentina in which the entrance of new plants is based on the market rules, there is no specific central planning or even indicative planning entity. The SE has assumed a limited role in sector planning, under Law No. 24065's directive to the SE to prepare and publish the plans and trends of supply and demand conditions in the national interconnected high-voltage system (SIN). New investments are left entirely up to the private sector. ENRE approves expansion plans for the distribution concessions created from SEGBA and sets physical criteria and reviews proposals for new transmission lines (for cost allocation purposes). New generation projects do not require concessions, but must register with the SE.
III. Sector Structure and Participants	
Structure	The Argentine electricity sector is already formed by a variety of distinct generation, transmission, distribution, commercialization and central load dispatch entities. Cross-ownership in these activities is strictly limited, with the transmission entities being forbidden to own any part of a generating or distribution enterprises and cross-ownership of distribution and generating assets limited to ten percent of the entire market. Most of these companies are in private hands, with only a minor participation of the federal government in the generation sector. The Majority of provincial utilities undertook only distribution activities and the remaining vertically integrated utilities have unbundled their distribution and generation activities.
Participants and Degree of Private Sector Participation	*Generation*: There are currently forty generating companies in the MEM and four in the MEMSP. Except for binational projects (Yacyretá, Salto Grande), the commercial nuclear enterprise (ENASA), and minor plants owned by provincial utilities and cooperatives, virtually all generation in the country is in private hands. Foreign investors hold a major ownership stake in these units. There are also various cogenerators and autogenerators in both regions. *Transmission*: The transmission activity in Argentina is subdivided into two systems: The High Voltage Transmission System (STEEAT), which operates at 500 kV and transports electricity between regions, and the regional distribution systems (STEEDT), which operate at 132 / 220 kV and connect generators, distributors and large users within the same region. Transener is the only company in charge of the STEEAT, and five regional companies are located within the STEEDT (Transnoa, Transnea, Transpa,

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	Transcomahue and Distrocuyo). In addition to these companies, there are also provincial transmission companies and independent transmission companies. These companies operate under a technical license provided by Transener, which in turn will make their assets available in the MEM in exchange for an established fee. *Retail Distribution*: The three distribution companies divested from SEGBA (EDENOR, EDESUR and EDELAP) represent 44% of the electricity market in Argentina. Including the companies divested from some regional utilities (Entre Ríos, San Luis, Córdoba, Mendoza, Formosa, Santiago del Estero, Tucumán, Río Negro, Catamarca, Misiones, Jujuy and Santafe), private participation in the distribution market has increased to 60%. The remaining distribution companies have remained in the hands of the provincial governments, but this ownership structure will change with the expansion of the new regulatory framework to the different regions of the country.
Targets for Privatization	Binational hydroelectric projects including Yacyretá and Salto Grande are targeted for potential privatization, and treaties with the respective governments of Uruguay and Paraguay are being negotiated. However, ratification of these treaties by the national legislature in Uruguay and Paraguay may be a difficult task. The construction, operating and maintenance functions for commercial nuclear generating units were reorganized under a new company, ENASA. This company is ready for privatization, but needs the approval of the Argentine legislature. About half of the provincial governments have undertaken the restructuring, corporatization, and/or privatization of their operating assets in the sector or are expected to do so shortly.
New Investments	Private (and maybe provincial government) interest will drive the construction of future generation projects. Private investors will most probably develop the expansions of the transmission and distribution networks. The large amount of new capacity entrants in the short-term, using natural gas combined -cycles and more units at Yacyreta, may lead to temporary over-capacity in the system, with a subsequent reduction in system prices. While these low prices may result in decreased incentives for investments in the electricity sector, there are large prospects for export markets, both to Chile and to Brazil, which will increase the possibilities for new investments in the country.
IV. Electricity Markets: Areas of Competition and Monopoly	
Bulk Power	The wholesale power market in Argentina (MEM) is highly competitive, taking into account the number of participants and the market rules. There are forty-four generation companies supplying both power systems. There are various generators with more than 1,000 MW of installed capacity, the largest one with 1,400 MW installed, only six percent of total installed capacity. Due to the apparent over-capacity in the system and its resulting low prices in the short- term, most transactions are occurring in the spot market. All entities participating in the market, regardless of ownership, must abide by market operating and pricing rules. The federal government holds a percentage of shares (20%) in CAMMESA, the company administering the MEM, but intends to relinquish these shares eventually. As in other Latin American countries, the re-integration of the market, based on new ownership structures of the companies and mergers, has raised questions regarding competition in the market. In the case of Argentina, market observers fear that the increasing participation of natural gas companies in the generation sector may lead to abuses in the fuel pricing structures.
Transmission and Distribution (Networks)	Transmission and distribution services are regulated concessions awarded under competitive bidding and subject to periodic rebbiding for the concession. Generation or distribution entities can only hold minority shareholder participation in transmission concessionaires. The Compañía Nacional de Transporte Energética en Alta Tensión (Transener) for which the concession was awarded in 1993, is responsible for the integrity and maintenance of the SIN, but not for the expansion of the system. The regional transmission concessions operate under the technical, safety, and reliability standards established by ENRE. Penalties are applied when the transmission concessionaire fails to meet these criteria, particularly those regarding outages and grid downtime. Generators can only build lines to connect to the grid, or directly to customers. Users pay for new

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	transmission capacity undertaken by them or on their behalf. A public hearing process for these projects is conducted by ENRE, which issues a "Certificate of Public Convenience and Necessity." Expansion of SIN projects exceeding $2 millions requires ENRE's approval and must be procured through an open competitive bidding process. Transmission or distribution networks connected to an integrated system must provide open access to third parties under a regulated toll system unless there is a capacity constraint.
Retail Distribution	Distribution enterprises under ENRE's jurisdiction compete for concession contracts and for the large consumers ($\geq$ 100 kW) market. Concessions are issued for distribution and commercialization services, with specific terms for the concessionaire stated in the contract. The 95-year contract term is broken into "management periods," which allow the concessionaire to give up the concession at certain (usually 10-year) intervals. EDENOR, EDESUR, and EDELAP are the major distribution concessions split from *Servicios Eléctricos del Gran Buenos Aires* (SEGBA), the former national utility, when it was privatized. ENRE establishes a (four-year) tariff for these distribution utilities that incorporates performance criteria according to efficiently run model enterprises of similar zone and service features. Provincial authorities control concession contracts and terms for utilities serving the provinces. Many provincial governments that have launched electricity sector reforms have followed the general concession terms and conditions used for distribution utilities under national jurisdiction. Large consumers are allowed to participate directly in the wholesale market, paying a regulated transportation fee to the distribution companies.
V. Load Dispatch and Pool Operation	
Dispatch Entity and Basis	CAMMESA was created in 1992 to administer the MEM and to perform the economic dispatch of the interconnected system. CAMMESA is an independent corporate entity owned equally by associations representing the generators, distribution entities, large consumers, and transmission entities as well as the Secretary of Energy.
Pool Operation	The MEM is the point of convergence of supply and demand in the Argentine Electricity Market and is administered by CAMMESA. The participants in the MEM are the generators, the distributors, the transmission companies, the large consumers (more than 50 KW) and the marketers. The MEM consists of both a contract and a spot market. The plants are dispatched according to economic dispatch order and are remunerated according to the short run marginal cost at the respective nodes (taking into account transmission constraints). Since the dispatch does not consider the contracts signed by the different plants, generation companies are obliged to buy or sell excess energy to or from the pool at spot prices. Although the contracts market is purely financial, it is restricted to the participants of the wholesale market. Price offered by thermal generators is based on the operating costs and the declaration for fuel prices has a maximum regulated value. Additionally, there are certain defined procedures for estimating the value of stored water, used by hydroelectric plants to bid into the market. The wholesale market is open to all groups and open access to the transmission and distribution networks is enforced.
VI. Pricing	
Bulk Power	Bilateral contracts between generators and distribution enterprises and large consumers are negotiated between them at their own accorded prices. CAMMESA uses the costs and availability declared by participants in the MEM to perform a centralized load dispatch and to estimate hourly spot prices. The reference point for calculating the load dispatch is the Ezeiza node, in which CAMMESA calculates the system short-run marginal price (PM), based on the variable costs of the plants and the hourly demand on the system. The spot price is complemented by a charge for available capacity in the system. Only plants dispatched under critical conditions are remunerated. They are paid $10/KW for each peak hour. Each plant is assigned a specific node within the interconnected system, and each one of those nodes has specific factors that determine the final prices at which the plants will be remunerated. The nodal factor

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	(FN) is calculated by taking into account the restrictions in the transmission system and the transmission losses in the system. Due to the existence of transmission congestion, some negative nodal prices could exist, and this factor reflects the price differential in the specified node. The factor is applied to the calculated price at the market node (PM). For plants located in exporting regions, the nodal factor is less than one. There is also an adaptation factor (FA), which is calculated based on the probability of failures in the system, and is multiplied by the capacity charge in each node. Seasonal prices (averaging SRMC) are also calculated for distribution companies in order to stabilize prices and protect final consumers. These are the prices that companies must use to compute the final prices to their consumers. Fees to cover CAMMESA's operating costs are applied to MEM participants. If insufficient capacity in the system causes failure, penalties are charged to generators; if distribution enterprises cause a failure by underestimating their demand, they are charged penalties. Overall bulk power prices have declined considerably from 1992 levels, which has led to an increase in spot-market transactions.
Transmission/ Distribution (Networks)	ENRE sets the method for calculating transmission tariffs and tolls, and CAMMESA implements it. These tariffs cover CAMMESA's costs for operation and maintenance of the system. Distribution enterprises with firm power contracts pay for the costs of supplying power at the system's central node and its transfer to the exit node. Tolls are applied for wheeling services and, along with generators' system connection charges, they cover the transmission system costs not included in the transmission rates. A rate-of-return is allowed for the transmission enterprise, but may vary according to its efficiency and cost-reducing success. Companies have to pay penalties if they don't meet quality of service criteria. The same principles apply to distribution network services, which are paid by large consumers when they buy the electricity directly from the wholesale market.
Retail Tariffs	EDENOR, EDESUR, and EDELAP's retail tariffs are established by indexed rate formulas in their concession contracts for an initial five-year period. These were set to cover the cost of purchased power, distribution system operating costs, taxes, and amortization. The tariffs also incorporate a rate-of-return to encourage the enterprise's efficiency, as well as an investment return expected for activities with parallel levels of risk. Penalties are applied for failure to meet established quality of distribution service criteria. ENRE oversees these tariffs, and will apply new tariff formulas based on defined criteria once the five-year period is over. Provincial authorities set tariffs for distribution utilities in their jurisdiction according to economic criteria promoted by sector reforms at this level. Absent reforms, retail tariffs in the provinces have historically been subjected to a political, rather than an economic, basis for tariffs.
Subsidies	A subsidy was applied to low-income pensioners in EDENOR, EDESUR, and EDELAP zones. This subsidy, valued at about 50% of the normal tariff, is paid out of the national treasury. Another type of subsidy has been provided to electricity-intensive industries based on the difference between the fixed tariff level and the market price, also estimated to be a 50% subsidy. Provincial governments may undertake additional subsidy programs administered through the provincial utilities. During the last three years, the distribution companies serving Buenos Aires have regularized services for more than three million people with the help of government subsidies.
VII. Sector Problems and Priorities	
Framework and Other Issues	1. Some confusion and a lack of confidence regarding the ability of the current transmission pricing system's ability to provide incentives for new investment in capacity is a critical issue of debate. The transmission system has experienced some bottlenecks, but the regulatory entity has not yet intervened to allocate the responsibility for expansion or allocate costs among the relevant interest groups. Therefore, investors are reluctant to build new facilities. The SE has established a fund ("SALEX") to support an emergency expansion of the system to relieve the immediate pressure. A study of this issue will be part of a consultant study on post-reform areas for improvement. 2. The impact of sustained, low spot prices on the wholesale market may have a negative impact on generating companies' financial health and interest in new investments because the capacity charges may not adequately reflect long run marginal costs for supply. Nevertheless, this condition will

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	disappear if demand increases, including exports to other countries. 3. Undertaking restructuring and privatization of the provincial utilities is occurring at an uneven pace due to the local governments reluctance to lose (as they perceive it) a ready-made source of revenues. Dealing with employee issues is one critical factor at this level. 4. The prolonged blackout that has occurred in Buenos Aires have raised questions about the operating conditions of the privatized distribution companies. The overseeing and penalty procedures affecting the distribution companies should be as strict as possible, guaranteeing that the concessions are following the contracts that they signed. 5. There is concern about the shareholder position of the Secretariat of Energy in CAMMESA. This raises questions regarding its independence especially taking into account the veto power that the secretariat retains.
Operating Needs	The low prices in Argentina's electricity sector reflect that there is enough generation capacity in the country. Even at the current conditions of low electricity prices, investors are still interested in building plants in Argentina, which guarantees that the electricity sector is covered on the generation side. Reducing losses and streamlining personnel was a critical financial need for privatized distribution enterprises in the Buenos Aires area, but efforts in this direction initially suffered setbacks due to local political pressures. However, overall employment in the sector was reduced by 42% after privatization, and overall losses in the areas served by former SEGBA utilities were reduced by as much as 9% after 1992. New approaches involving the local government and neighborhood leaders resulted in positive steps to resolve the problem of losses and allow the utility to make legal connections and recover some costs associated with these in problematic low-income neighborhoods.
Electrification and Energy Efficiency	Only a small fraction (less than five percent) of the country's population is not electrified. The level of electrification in isolated regions is around 70%. By the end of 1995, the SE created a special program, the PAEPRA, to promote the provision of electricity to rural areas in the country. Concessions will be awarded to the private sector to provide the service in these areas. The program is putting particular emphasis on the use of small alternative energy systems (mostly renewable) to meet the demand requirements. This type of effort program is being supported by MLAs. As in many cases, the costs would be higher than the economic possibilities of the customers; therefore, the program contemplates the use of direct subsidies.

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VIII. Sources and Relevant WEB Pages

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