

THE POWER SECTOR IN: COLOMBIA

Issue Area	COLOMBIA
I. Current Status of Sector Reform: Key Points	
Power System Overview	Electricity generation in Colombia was 43,932 Gwh in 1998, and installed capacity reached 12,057 MW (68% hydro) by the end of the year. Due to the economic slowdown in the country, electricity demand grew only 0.2% in 1998, this trend of slow demand growth is expected to remain, at least throughout 1999. Large capacity additions have occurred in the last few years, primarily by the private sector. The remaining capacity additions until the year 2002 comprise three hydro projects (amounting to more than 1,200 MW) currently under development by the public sector. The electricity service coverage in Colombia is 85% of the population. With the exception of some minor isolated systems, the power sector in Colombia is fully interconnected and behaves as a sole market.
Structure	All newly privatized government or municipal utilities have been unbundled with the exception of EPSA (with 7.2% and 4.4% of the generation and distribution markets respectively), which has sold a controlling 56% stake, but has remained vertically integrated. The only major remaining vertically integrated utility in the country is Empresas Públicas de Medellín (EPM) with 14.1% and 16.9% of the generation and distribution markets. Nevertheless, these utilities hold separate accounts for the different segments of the market. Up until now, Interconexión Eléctrica S.A. (ISA) had been the major transmission company in the system and had operated the dispatch and the energy exchange. Nevertheless, because of the privatization process, there has been some horizontal reintegration in the distribution markets, North Coast and Valle, and some vertical reintegration in the generation and distribution markets in Bogota.
Competition	There is competition at the wholesale level. Distribution companies, large users (500 kW or more) and marketers all shop for power among different generators through financial bilateral contracts or directly from the spot market. The spot market is competitively based, with the lowest cost bid dispatched first (i.e. economic merit order) over the system. Open access to transmission and distribution networks is provided, but retail competition has not evolved yet. During drought periods, transmission constraints among other causes allow some companies to exercise significant levels of market power, thus jeopardizing the potential for competition.
Role of the State	<p>The Electricity Law and the Public Utilities Law created new regulatory and oversight authorities and a separate policy-making agency. These entities operate relatively independently of the central government's commercial interests; however, both Comisión de Regulación de Electricidad y Gas (CREG), and Mines and Energy Planning Unit (UPME) operate under the Ministry of Mines and Energy (MME). The dispatch entity and the energy exchange operate under ISA, which is the transmission company that is currently in government hands. Municipal governments retain considerable authority over their respective municipal utilities.</p> <p>The government expects to privatize its remaining holdings in the commercial activities of the sector during 1999, which include distribution, generation and transmission assets.</p>
Regulatory Institution	<p>CREG has been operating in a relatively satisfactory way since 1993 when it was established by decree, and affirmed by law in 1994, as a new institution in charge of regulating the electricity and gas sectors. Its independence has been questioned, as three ministers sit in its eight-member board of directors, and most of its budget comes from the Ministry of Mines and Energy.</p> <p>The 1994 Law also created the Superintendence of Public Services (SSP) to oversee the compliance of public service enterprises with legal and regulatory criteria.</p>
Private Sector Participation	<p>In early 1999, private investors controlled fifty-nine percent of the installed capacity. Transmission is in government hands and around forty percent the distribution market is under private sector control.</p> <p>The Electricity Law directs the regulatory entity to open entry to the private sector and to encourage its participation in all commercial activities of the sector. IPPs have entered the market adding more than</p>

Issue Area	COLOMBIA
	<p>1,500 MW of capacity. The privatization process has been extremely successful and includes the Chivor and Betania hydroelectric plants (together totaling 1500 MW); the Termocartagena thermal plant (150 MW); fifty-seven percent of the Empresa de Energía del Pacífico (EPSA), with a generating capacity of 730 MW and distributing energy in the Valle del Cauca (not including Cali); a controlling 48.5% participation in the generation and distribution companies derived from the Empresa de Energía de Bogotá (2,448 MW and 1.5 million customers); and, a controlling (65%) of the two distribution companies derived from CORELCA.</p> <p>Private companies will perform most of the expansion of the system, as the government is committed to move out of the commercial activities in the sector. Therefore, the central government intends to divest all of its holdings in the sector in 1999. It is planning to privatize the generation assets split from ISA (ISAGEN) and ISA transmission. It is also planning to privatize around 14 regional distribution companies in 1999. CORELCA generation is also scheduled for privatization. Therefore, the only companies remaining in public hands will be EPM and a few small municipal distributors.</p>
Major Outstanding Issues	<ol style="list-style-type: none"> 1. CREG's ability for effective and independent decision-making has been considerably curtailed. The government is currently undertaking a study to reform its structure, which should guarantee that the agency is independent in both political and financial terms. 2. Implementation of a new rate structure and a plan to eliminate or simplify subsidies, though critical to the financial health of distribution utilities, has been delayed for political reasons until the year 2000. 3. Major market power concerns have been raised. The privatization process has led to new private companies with significant market power. Even though the government has put in place ownership limitations to control market power, it should also keep track of possible market abuses by the different players. Among the major aspects to watch for market power are the transmission constraints between the Atlantic Coast and the interior region and the horizontal reintegration of the markets through privatization. 4. The operation of the system during droughts is less than optimal. Pool operations require an upgrade to reflect the hydroelectric nature of the system. 5. The economic slowdown has directly affected the electricity sector. The Colombian economy grew only 0.2% in 1998, and the growth expectations for 1999 are even lower. Electricity demand grew at the same pace in 1998, a rate that was significantly lower than the government's forecasts of around 5%. Using those 5% projections and the new liberalized framework, many investors built new plants in the country, which resulted in over-investment in generation capacity under current conditions. This could result in low market prices, which will deter further investment. Consequently, the latest expansion plans only show the new commissioning of three hydro plants already under construction and ISAGEN's TermoCentro plant. However, over-capacity may end up being lower because of unforeseen delays in the construction of the three hydro plants. 6. Spot prices are highly volatile due to the hydro-based conditions of the system. 7. Natural Gas provision remains uncertain, as the investment in the new gas fields has slowed down significantly. The dash to gas experienced in recent years has been dampened by the monopoly of gas trade exercised by the government-owned Ecopetrol, and by the investment fears of foreign investors. The government has set-up a team to address this issue and to find a solution by the end of 1999. Among the tasks that would be analyzed by this team are the take-or-pay structure of the gas contracts and trying to find more liberalized commercial structures.
II. Legal & Regulatory Framework	
Legal Basis	<p><i>New Constitution (1991)</i>: Includes 12 articles supporting private participation in all economic activities. Those articles also consider: competition as a means to achieve greater economic efficiency; reform of public enterprises to make them more accountable and efficient in their operations; redirection and decentralization of regulatory activities; emphasis on deregulated pricing in public service activities and</p>

Issue Area	COLOMBIA
	<p>regulated pricing based on economic costs; and refocusing the Government's involvement in economic areas to policy, regulatory, oversight, and standard-setting functions</p> <p><i>Public Utilities Law (Law No. 142, 1994):</i> Passed along with the Electricity Law, it created a distinct type of public corporate entity able to issue shares. It established procurement and contracting guidelines based on commercial practices for all utilities (also supported by changes in the General Commercial Code), thereby eliminating time-consuming, bureaucratic processes. All utilities were required to establish retirement funds according to new rules and all public service enterprises were put under the same regulatory and tax regimes, regardless of ownership. The law also opens public utility areas to private sector participation and promotes free entry and competition wherever feasible in public service areas. It calls for regulation of activities that are natural monopolies and safeguards against monopolistic behavior by proposing the separation of competitive and monopolistic activities (i.e., restructuring of these activities in a broad sense), which would also give consumers the right to choose their service provider. A regulatory commission for electricity and gas (CREG) was put in place to regulate the electricity and gas sectors, as well as a separate oversight and enforcement agency for public services, denominated the "Superintendence of Public Services" (SSP).</p> <p><i>Electricity Law (Law No. 143, 1994):</i> Legally established the eight-member Energy and Gas Regulatory Commission (CREG) with five commissioners selected for their experience and expertise in indicated professional fields (e.g., economics, engineering) and three ministry officials. The Minister of Mines and Energy presides and must sign all directives voted on by the CREG. A quorum of six members is required for voting. The law outlines goals for the restructuring and divesting for central government-owned enterprises, including ISA, introducing competition in the sector, enabling private participation in all activities, dictating open access to transmission and distribution networks, deregulating large (≥ 500 kW) consumers, and establishing independent regulatory and oversight authorities.</p> <p><i>Decree Law No. 700 (1990):</i> Allows private generators to have access to utility transmission and distribution networks in order to deliver contracted power directly to end-users.</p> <p><i>Decree Law No. 2119 (December 1992) and implementing regulations in Decree Law 1253 (June 1993):</i> Pending congressional enactment of legislation incorporating these measures, these laws established the Energy Regulatory Commission comprised of the Minister of Mines and Energy, the Minister of Finance and Public Credit, the Director of the Planning Department, and three appointed commissioners with expertise in indicated professional fields. The decree also allowed private sector participation, domestic and foreign, in energy and mining areas.</p>
Institutional and Regulatory Entities and Jurisdiction	<p>The Ministry of Mines and Energy (MME) sets sector policies. Municipal authorities issue distribution concessions.</p> <p>The National Planning Department (DNP) oversees and gives initial approval of the budget for government enterprises before submitting the budget to Congress. The Tariff Commission was formerly under DNP as well.</p> <p>The National Energy Financier (FEN), a public financing entity created in 1982, arranges financing for investment and refinancing projects carried out by the public sector in electricity, coal and gas industries.</p> <p>The Energy and Gas Regulatory Commission (CREG) was created by decree in 1993 as part of the MME. Its duties were to establish operating and technical guidelines, undertake tariff studies, establish the basis for tariffs and promote competition and private sector investment in the sector. The 1994 Electricity Law reestablished the CREG and confirmed its role and area of jurisdiction as the regulator for the electricity and gas sectors. CREG's current duties include: regulation of monopoly areas; promotion of competition and price deregulation; fostering of efficiency; restricting areas of cross-ownership that reduce competition; discourage vertical integration; guard against anticompetitive behavior; establish pricing formulas for regulated activities; mandate open access to transmission and distribution networks; protect consumers against monopolies; and request SSP to impose sanctions on sector enterprises for non-compliance. The 1994 Law increased the number of independent appointees (with four-year staggered</p>

Issue Area	COLOMBIA
	<p>terms) to the CREG to five (from three), with three Minister-level members. The Minister of Mines and Energy presides over the Commission. All members have equal votes. A quorum of 6 is required for voting. Regulated entities contribute up to 1% of their revenues to support the CREG.</p> <p>The Public Utilities Law created a Superintendence of Public Services to oversee competition as well as public service providers' management, safety, and service standards. The Law calls for the promotion of efficiency for regulated utilities via benchmarking regulation. SSP is assigned to oversee the application of the tariffs set by the CREG and adherence to legal and regulatory requirements; impose fines; and to intervene in utility management to assure continuity of service.¹</p>
Sector Planning	<p>According to the constitution, the Government (via MME) is responsible for ensuring an adequate and reliable supply of electricity. UPME operates under MME and is in charge of estimating future demand and making indicative expansion plans for generation and the interconnected system. A unit of the UPME collects and organizes operational and financial data pertaining to the electricity sector.</p>
III. Sector Structure and Participants	
Structure	<p>The current structure of the electricity sector in Colombia is a direct result of the stipulations formulated in the Electricity Law and the Public Services Law. The central government utilities (ISA, ICEL, and CORELCA) were subdivided into separate business that are either currently privatized or targets for privatization. With the exception of some regional and municipal companies, such as EPSA and EPM, which have separate accounting for the different business units, and the reintegrated Bogota market (because of recent mergers and acquisitions), the Colombian system is mostly vertically segregated.</p>
Participants and Degree of Private Sector Participation	<p><i>Generation:</i> The central Government retains ownership of the following generating enterprises: ISAGEN, formed from the remaining generation assets of the former Interconexión Eléctrica S.A. (ISA); Corporación Autónoma del Valle de Cauca (CVC), which now exists only to manage river basins; the generation portion of CORELCA, which will be privatized in the near future; and the Instituto Colombiano de Energía (ICEL), with about 124 MW of generating capacity. The Ministry of Finance owns 4 power plants with a total installed capacity of 272 MW, which are run by local utilities. Ecopetrol, the national petroleum company, operates 3 generating plants with a total capacity of 80 MW.</p> <p>The large municipal utility operating in Medellín (EPM) is vertically and horizontally integrated. It owns and operates 2,300 MW of installed generating capacity, serves some 16% of the electricity distribution market through its electricity and natural gas distribution branch and owns and operates some transmission. Numerous private self-generators (which built plants partially to avoid paying subsidies to residential consumers) own a considerable amount of capacity that has been used to support the public electricity system.</p> <p>The central government privatized the 500 MW Betania Hydropower Station (CHB), the 1,000 MW Chivor Hydropower Station, and the 150 MW Termocartagena thermal station. EPSA, the enterprise operating in the southwest has been sold (56%) and the Empresa de Energía de Bogotá was divested and capitalized. IPPs are operating projects with capacity of more than 1,000 MW. The IPPs own the generating plants of Termodorada (50 MW), Flores (255 MW), Proelectrica (90 MW), TEBSA (900 MW), Merrilectrica (160 MW), and Termovalle (199 MW) among others. At present, about 6,241 MW of operating capacity (56% of the total installed capacity) is in private hands.</p> <p><i>Transmission:</i> ISA owns most of ², and operates, the high-voltage national interconnected system. With the acquisition of CORELCA's transmission assets, ISA increased its participation in the Colombian</p>

¹ SSP may temporarily assume operating and managerial responsibilities under specified conditions if required to ensure the continuity, quality, and regularity of service, until other solutions can be adopted.

Issue Area	COLOMBIA
	<p>transmission grid to more than 83%. ISA has undertaken the latest investments in transmission in the country, which includes the 500 kV line that connects the Antioquia region with the southwestern region of the country in 1998.</p> <p><i>Retail Distribution:</i> A large distribution utility operates in the city of Cali (EMCALI), and the largest distribution utility (CODENSA) with 1.5 million customers, operates in Bogotá. One vertically integrated utility provides retail electricity and gas service in Medellín (EPM). Two private distribution companies (Electrocosta and Electrocaribe) serve the Atlantic region. Other municipal utilities serve the cities of Pereira, and Cartago. Fourteen regional distribution utilities serving small markets, formerly subsidiaries of ICEL, have been reorganized and restructured for future privatization. Tuluá, a small distribution utility, was the first distribution company privatized.</p>
Targets for Privatization	The privatization program for 1999 will be very active with the sale of ISA and ISAGEN, the crown's jewels. Among other significant privatizations will be the sale of 14 distribution companies and of CORELCA's generation companies.
New Investments	Due to the high levels of added capacity in the last few years, and the latest projections of slow demand growth, there will be no significant investments in generation in the near future. In the event demand for electricity is reactivated private investors most likely will built Combined Cycle Gas Turbines. Privatized distribution companies will be busy revamping and upgrading their systems to improve reliability and to control losses.
IV. Electricity Markets: Areas of Competition and Monopoly	
Bulk Power	<p>The Wholesale Power market in Colombia is rather competitive, as generation companies and buyers participate in the power pool. Open access principles and ownership restrictions promote competition in the sector. Vertical integration is allowed, but companies are required to have separate accounting for each business activity. Vertically integrated utilities are obliged to buy at least 40% of their captive demand (from regulated customers) from third parties.</p> <p>The number of participants in the generation sector is sufficient for providing a competitive environment. The largest generation company is EMGESA, with 20% of the generation market, followed by ISAGEN, EPPM and TEBSA. There are various independent producers operating in the market under competitive terms.</p> <p>There are currently major concerns regarding the horizontal reintegration process in the Colombian wholesale market, as it could lead to market power. The participants in the privatization process have primarily been the same companies, and some of the winners have acquired assets in various companies in the country. A close watch should be taken on further privatization to avoid concentrations fostering the exercise of market power by any generator.</p>
Transmission and Distribution (Networks)	The Electricity Law provides for open access to the interconnected transmission system, secondary transmission systems, and distribution networks for all entities, in order to foster greater market competition. MME issues concessions for the national and regionally interconnected transmission systems, and regional government authorities issue concessions for independent regional systems. Although ISA has an exclusive concession for the operation of the national interconnected system, generators and other transmission entities own certain lines and facilities of the system and expansion rights are not exclusively held by ISA Transmission.
Retail Distribution	Consumers with 500 kW or more of demand have been deregulated and may freely choose their supplier and negotiate their own supply terms. In the future, the threshold for deregulated consumers is expected to be lowered until virtually all consumers have direct access to an open supply market. As markets are liberalized, competition among distribution enterprises, generators, and self-generators is expected to heat

² ISA built large generating units and expanded the high voltage interconnected transmission system. State and municipally owned enterprises held shares in ISA until the central government obtained majority ownership in 1993 to restructure and privatize it.

Issue Area	COLOMBIA
	<p>up for deregulated consumers.</p> <p>Concessions for retail activities, issued by local authorities through a competitive process, are required. However, solitary (therefore, non-competitive) bids for concessions are acceptable as long as technical and economic requirements are met. The concession contract must specify the requirements defining the area, scope, and quality of service; obligations and rights of involved parties; penalties, pricing terms, and other remuneration; investment requirements; renewal, suspension, transfer, or rescind terms for the concession, and other issues. Concessions are assigned for a maximum 30-year period, and are renewable for 20-year periods.</p>
V. Load Dispatch and Pool Operation	
Dispatch Entity and Basis	<p>ISA Transmission operates the National Dispatch Center, which performs central load dispatch functions for all generating units on the interconnected system. An oversight committee, CNO, comprised of generators, ISA, regional transmission, and distribution companies set general guidelines for dispatch operations according to economic load dispatch, open access principles and CREG guidelines. The Center calculates the short-run marginal cost based on bids from market participants. This short-run marginal cost is used for pricing non-contracted energy that is bought directly to the pool and inter-generator power transfers.</p>
Pool Operation	<p>The wholesale power market is composed of two parts: the spot market and a contracts market. The spot market is based on the economic dispatch determined by the national dispatch center. Each generation company bids hourly prices and declares available capacity for the following day. The national dispatch center then performs a least-cost dispatch based on the price offers. The spot price at which all the dispatched energy is remunerated is the price offer of the most expensive of the dispatched plants. The long-term contracts market is purely financial, as the physical dispatch of the plants is based on the price offers to the power exchange. These contracts are a form of futures contracts with which the distribution and generation companies hedge against the financial risk imposed by the price volatility in the spot market. If a generation company is not dispatched enough to cover the contracted energy, they are forced to buy the remaining energy from the spot market at the determined spot price. Long-term contracts are currently restricted to direct market participants and are awarded by tenders of the distribution companies. In the near future, the market could evolve to point of creating a futures exchange in which not only the electricity market participants, but all the interested parties could take long and short positions in futures and options contracts, with better opportunities to hedge against financial risk.</p> <p>All generators are allowed to sell energy to other generators, to deregulated large consumers and to distribution entities on a contract basis or directly to the spot market.</p> <p>Participation in the generation, transmission and distribution sectors is open to all investors and open access exist in the transmission and distribution networks.</p>
VI. Pricing	
Bulk Power	<p>The contract market is completely deregulated; generators are free to negotiate their capacity with distribution companies, other generators or large consumers. Sales and purchases from the power pool are priced according to the dispatch, which is performed by the Energy Exchange and is based on participant's hourly bids for the next day.</p>
Transmission/ Distribution (Networks)	<p>A system of regulated transmission fees and tolls applied to users of the system is established to cover all operating, maintenance, and investment costs, which includes a rate of return set for an efficiently operated enterprise. Service provided over secondary transmission systems are subject to negotiated fees for the use of the system. The CREG sets the pricing guidelines for establishing primary transmission service tolls that include access, interconnection, and capacity- and energy-based charges.</p>
Retail Tariffs	<p>Regulated retail tariffs are established according to a formula that allows pass-through of power purchase costs, relevant transmission tolls and fees, and a value for distribution service based on recovery of operating, maintenance and investment costs and a reasonable return on investment. The formula</p>

Issue Area	COLOMBIA
	<p>considers distribution costs in light of those calculated for an efficiently run distribution system of similar features (i.e., benchmarking). The tariffs include clearly identified basic, connection, energy-based, and capacity-based charges to the consumer that allow recovery of the associated economic costs-of-service.</p> <p>Deregulated consumers (≥ 500 kW) are free to negotiate supply contract prices with their suppliers.</p>
Subsidies	<p>Subsidies in Colombia are moving from the inefficient cross-subsidies system to a more targeted system that benefits the appropriate groups. Distribution companies had suffered large deficits due to this subsidy system and local and national governments had been obliged to compensate for these deficits.</p> <p>Future subsidies in Colombia will be in the form of a tax that targets the financial assistance to the specific group that needs it, such as low-income groups and rural users.</p>
VII. Sector Problems and Priorities	
Framework and Other Issues	<p>The Public Utilities Law and the Electricity Law evolved in parallel and although the regulatory design is basically complete, overlapping areas of jurisdictional authority need to be resolved. A plan to improve the legal basis of authority in the sector through a major rewrite of the relevant sectoral laws appears to have been discarded.</p> <p>The government should move forward to strengthen CREG's structure. The entity should be politically and financially independent from the central government. Also, the pool operation should be modernized to incorporate second generation developments.</p> <p>A close watch to market power is necessary, as the privatization process could lead to some horizontal reintegration of the generation market.</p>
Operating Needs	<p>Distribution utilities have suffered financial difficulties because of high system losses, inadequate tariff levels, and onerous subsidy programs. Some cannot honor contractual obligations to pay for purchased power, which increases commercial risks for private generators selling power to these utilities.</p> <p>The present conditions of excess supply are forcing bulk power prices down and exerting considerable pressure from the new thermal plants to get their power dispatched. However, unexpected delays in the three plants currently under construction could reduce over-capacity.</p>
Rural Electrification and Energy Efficiency	<p>There is an overall service coverage level of 85% or more. ICEL, a government-owned entity, remains responsible for continuing electrification efforts in rural areas. Electrification is partially funded through consumer cross-subsidies, national and local budget allocations. A consumption tax on electricity may be used for this purpose in the future.</p> <p>A US\$ 10 million energy loan from the IDB was recently approved to implement energy efficiency programs.</p>
VIII. Sources and Relevant Web Pages	
<p>Sources</p> <p>Lecaros, F. "Estudio del Sector Eléctrico Colombiano". Banco Interamericano de Desarrollo. July 1998.</p> <p>Latin American Power Watch. Monthly Newsletter. Washington DC</p> <p>Relevant Web Pages:</p> <p>Interconexión Eléctrica SA (ISA): http://www.isa.com.co</p> <p>Comisión de Regulación de Energía y Gas (CREG): http://www.creg.gov.co</p> <p>Empresas Públicas de Medellín (EPM): http://www.eppm.com</p> <p>Empresa de Energía de Bogotá (EEB): http://www.eeb.com.co</p>	

