

THE POWER SECTOR IN: COSTA RICA

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I. Current Status of Sector Reform: Key Points	
Power System Overview	Costa Rica's installed capacity by the end of 1998 was 1,372 MW, with a total generation of 5,854 GWh during the year. Electricity consumption was 5,043 GWh; losses were around 11% in 1997. Electricity demand has been growing at a rate of 5% per year. Electricity service coverage has reached 93% of the national territory. The power market behaves as a sole system and will be part of the regional Central American market.
Structure	The sector is still dominated by the Instituto Costarricense de Electricidad (ICE), a government-owned, vertically integrated utility. Compañía Nacional de Fuerza y Luz (CNFL) distributes electricity in the capital San Jose, which is the largest market (75%), and it also owns small generating plants. There are several participants in the generation sector, as a handful of small independent generators and self-generators have entered the market since 1990 selling power to ICE under limited conditions. Two integrated municipal utilities and 4 electric cooperatives provide distribution service in areas beyond the capital city.
Competition	ICE remains as the major participant in Costa Rica's power market. It generates electricity and buys the production from the independent generators (which currently represent less than 10% of the total generation market). It transmits the electricity and distributes it to a significant portion of the final users. It also sells the electricity to the other distribution companies. Distribution companies have the monopoly on their respective regions. ICE is also in charge of the dispatch and operation of the system.
Role of the State	Apart from participating in all the commercial activities in the industry, ICE is also in charge of sector planning and operation. Policy functions are performed by the Ministry of Natural Resources the Environment and Energy (MINAE) and the new regulatory authority, Autoridad Reguladora de los Servicios Públicos (ARESEP) is in charge of setting tariffs and of overseeing the sector.
Regulatory Institution	The Public Services Regulatory Authority Law passed by the Legislative Assembly in 1996 provides for the transformation of the Servicio Nacional de Electricidad (SNE), the regulatory entity established for the electricity sector in 1928, into the Public Services Regulatory Authority). ARESEP is a multi-sector agency in charge of regulating the power, telecommunications, hydrocarbon, irrigation, public transportation, maritime and air services, rail cargo transportation and waste disposal. It is in charge of setting the prices and tariffs for the industry and overseeing its correct operation. It is also in charge of organizing public auctions to award new independent generation projects.
Private Sector Participation	<p>After opening the sector to private participation in the generation sector in 1990 under Law No. 7200 (subsequently modified in 1995 by Law No. 7508), a number of private generators with an aggregate capacity of 124 MW have secured contracts to provide power to ICE. Private generators represent 8.3% of the total generation.</p> <p>As authorized by Law No 7508, ICE selected through an international competitive process in 1997 the developer to Build Operate and Transfer the 28 MW Miravalles III geothermal project. The winner bid was a consortium of Oxbow Power Corporation and Marubeni Corporation; nevertheless, ICE remained the steam supplier for the plant. The BOT project will begin operations by the end of 1999, and has a 15-year contract with ICE. These bidding processes will be most likely means for building new capacity in Costa Rica.</p> <p>If Congress passes the two new bills under its consideration, IPPs could sell their energy to buyers different from ICE after five years of the implementation of the law. The new law would also eliminate the current restriction that limits the capacity of individual private power plants to 50 MW and limits aggregate IPP capacity to 30% of the country's installed capacity.</p> <p>CNFL (ICE's distribution subsidiary serving San Jose) was recently corporatized and transformed into a joint-stock company. A controlling share of the company will be probably sold to a strategic investor.</p>
Major	1. ICE remains as a vertically integrated government-owned utility with a dominant position in the

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Outstanding Issues	<p>sector that may inhibit competition and private sector investment. Also, it may be able to exert considerable pressure on the regulatory agency.</p> <ol style="list-style-type: none"> 2. The existing legal framework has disincentives for investment in thermal generation. ICE's screening of proposed projects may make these subject to changes that accommodate ICE's criteria but not necessarily those promoting economic or investment efficiency. 3. The Government is contemplating changes in the regulatory agency, ARESEP, which oversees numerous public service areas. The idea is to combine the regulatory responsibility for the telecommunications and electricity sectors, and to deregulate (or reassign) other areas in order to reduce the regulatory burden and promote economic efficiency. 4. In late 1998, the government of President Miguel Angel Rodriguez unveiled a reform proposal to liberalize the country's generation market. The new framework has been delineated into two pieces of legislation that will require congressional approval. The laws include the creation of a separate operating and dispatch entity and the removal of the restrictions to private generators. This law would also direct ICE's restructuring in order to make the market more competitive. This government proposal is the second one sent to Congress since 1996; the first one, introduced in mid-1996 but never enacted, outlined the restructuring of ICE into different business units, but did not provide for open market competition. 5. The regional treaty for the creation of the Central American common market, which Costa Rica signed, requires the national utilities to separate their activities and to move gradually in the reform process. Failure by Costa Rica to move in this direction may put the whole integration process into jeopardy. 6. A cap on the country's debt (imposed by IMF) has resulted in a situation where the public utilities raise tariffs but do not reinvest the resulting revenues into the respective sector. In the electricity sector, this has resulted in a critical supply crisis caused by the lack of investment in the expansion of new system capacity (and maintenance of existing capacity).
II. Legal & Regulatory Framework	
Legal Basis	<p>The sector's legal framework is broadly shaped by a General Law for Concessions of Public Services (Law No. 7329, 1993), which provided for private participation in all areas of public service concessions. However, this law has yet to make a significant difference in the electricity sector.</p> <p>Law No. 7200 (1990) allowed private independent generators and self-generators using new or renewable energy resources to sell energy to the public electricity system via ICE. However, the law limited the size of the units to less than 20 MW and limited to 15% the total installed capacity owned by independent generators. The law also required local ownership of at least 65% of the share capital.</p> <p>Decree No. 7508 (1995) modified Law No. 7200 by raising the limits for independent generators participation to 30% of the total installed capacity in the system. It also raised the maximum size of the units to 50 MW and reduced the required percentage of local capital participation to 35%. It also required that the concessions for new (alternative and renewable energy) capacity would be awarded under competitive bidding procedures according to bid price and a technical, economic, and financial evaluation of the bidder's proposed project. The decree authorized ICE to attain international agreements for electricity transactions with other regional or state-owned utilities, and allowed mixed-ownership enterprises to participate in the sector.</p> <p>The law that established SNE (Law No. 258, 1928) was radically modified by Law No. 7593, passed by the Legislative Assembly in October 1996, transforming SNE into the new Regulatory Authority for Public Services (ARESEP) with greater regulatory autonomy, powers and jurisdiction over public services.</p> <p>Congress is currently considering two new laws that would change the structure of the electricity</p>

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	<p>industry:</p> <ul style="list-style-type: none"> – The first one, the new general electricity law, will retain the obligation of private generators to sell to ICE for five years. After that time they could market power directly to local end users in competition with ICE, and also to customers in the common Central American market. ICE and the other two public utilities will retain the monopoly in the distribution sector. This bill will also eliminate the current restriction that limits the production of individual private power plants and limits the aggregate IPP capacity to 30% of the market. It will also require new IPP projects to be hydro plants or gas-fired generators. This same bill will create a new entity, the Centro Nacional de Planificación y Operación de Electricidad (CENPO), which will be the system operator and will be independent from ICE. – The second piece of legislation will reorganize ICE, making it more entrepreneurial and creating separate business divisions.
Role of the State	<p>The state, through its national utility ICE is in charge of most of the commercial activities in the system. ICE is also in charge of sector planning and technical operation. The Ministry of the Environment and Energy (MINAE) is in charge of setting the policies for the industry and ARESEP is in charge of regulation.</p>
Institutional and Regulatory Entities and Jurisdiction	<p>The Ministry of Environment and Energy (MINAE) is in charge of defining the policies, setting the strategic orientation and coordinating activities in the electricity sector. It formulates policies for the use and protection of renewable energy and other natural resources as well as the environment in general.</p> <p>MIDEPLAN, the Ministry of Planning, coordinates economic expansion among the various sectors at the Ministry level.</p> <p>The Autoridad Reguladora de los Servicios Públicos (ARESEP) was established by law in 1996 through the transformation of the Servicio Nacional de Electricidad (SNE, established in 1928 as the regulatory authority for the electricity sector).¹ It issues new concessions for all public service entities, regardless of ownership or type of service, as well as for the use of renewable energy resources in power generation applications. These include providers of electricity, telecommunications, potable water and sewage, irrigation, transportation for hydrocarbons, public transportation and cargo services. ARESEP is in charge of issuing regulations that cover the establishment of sectoral operating, technical, and quality of service standards, including network access policies. It is also in charge of overseeing operating rules and norms, quality of service, and technical standards relevant to activities under its jurisdiction and compliance with other relevant laws and regulations. Furthermore, it is in charge of approving regulated retail tariffs and service charges and the methodologies used to set them and of overseeing the application of regulated tariffs and charges. ARESEP determines the amount of subsidies and fees to be collected for the Electrification Fund set up to support the subsidy program and also undertakes the technical and safety inspections. ARESEP holds public hearings on proposed tariff/price changes; changes in pricing/tariff formulas; on proposed new generation projects; and will take other appropriate measures to increase the transparency of the regulatory process. Other duties include establishing information systems for sector participants, establishing customer rights and obligations, and arbitrating conflicts.</p> <p>ICE will be separated into different business units under the new law, but will remain under the state as a vertically-integrated state-owned enterprise operating under a commercial basis.</p>
Sector Planning	<p>ICE is currently responsible for sector planning. Under the new law, the reorganized ICE corporation, through its Electricity Planning Center, will retain primary responsibility for designing and implementing power sector generation and transmission expansion plans for the National Electric System that ensure that demand requirements are met. It is required to give preference to the use of sustainable renewable energy in generation projects, and to consider environmental protection, energy efficiency, and energy</p>

¹ The Servicio Nacional de Electricidad established by law in 1928 and significantly amended in 1941, was the only active regulatory agency for the electricity sector in Central America/South America until the 1980s.

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	<p>conservation criteria, and is expected to undertake studies and elaborate technical and other criteria as guidelines for this objective. It will consider expansion plans of each sector enterprise according to policies issued by MINAE. As well, it will determine whether projects to be undertaken to meet national planning requirements will be done via private sector investors (through a competitive bidding process), joint public-private investment ventures, or directly by itself. National considerations will also be incorporated into the planning process in regard to the regional electricity interconnection schemes.</p>
III. Sector Structure and Participants	
Structure	<p>ICE is the government-owned, vertically-integrated utility that generates most of the power requirements for the country's distribution enterprises; provides all transmission and interconnection service; and directly (in isolated areas) and through its subsidiary, the Compañía Nacional de Fuerza y Luz (CNFL), provides 75% of the nation's distribution service. The two municipal utilities own generating capacity as well as provide distribution service. Four electric cooperatives provide distribution service in isolated systems. A small degree of decentralization in generating activities occurred in the 1990s, as ICE's electricity output was supplemented by purchase contracts (PPAs) with small private generation projects and by transfers from other systems in the region.</p> <p>The proposed new industry structure considers the unbundling of ICE into separate business units, but does not consider its privatization. The law will not allow vertical integration for new entrants in the industry.</p>
Participants and Degree of Private Sector Participation	<p><i>Generation:</i> The public utilities ICE, CNFL, JASEC and ESPH and the rural electric cooperatives own approximately 90% of the installed generating capacity available to the national electric system, and about 10% is owned by a number (around 21) of private IPPs and self-generators. About 30.2 MW of privately-owned capacity was built as part of the initial phase of a national program to expand the generation capacity via the private sector, based on various laws enacted in the early 1990s, and has since increased to around 124 MW. In addition, the third unit of the Miravalles geothermal plant was competitively bid out as a BOT project in the program's second stage in 1997.</p> <p>Under the proposed law, the reorganized ICE, as well as distribution companies, other public or public-private enterprises, private IPPs, self-generators, cogenerators, and foreign suppliers are expected to supply electricity to the public system. New alternative and renewable energy projects are expected to be competitively solicited or built either directly by ICE or under strategic partnerships formed between ICE and private investors. Municipal distribution utilities and electric cooperatives will also be allowed to develop renewable energy-based generation that are included in the national expansion plan, up to specified limits².</p> <p><i>Transmission:</i> ICE is, and will remain, the owner, operator and coordinating entity of the interconnected transmission system (SIN). It will also remain the sole entity responsible for international interconnections. However, other enterprises may build transmission connections to the SIN as long as they comply with the relevant environmental and technical operating criteria, at its own expense and risk. ICE must fulfill requests for connection from sector enterprises and large consumers, who pay for the service.</p> <p><i>Retail Distribution:</i> The main distribution utility is the recently corporatized CNFL, serving San José, the country's capital and largest metropolitan area. ICE owns CNFL. Two municipally-owned utilities, La Junta Administrativa del Servicio Eléctrico de Cartago (JASEC) and La Empresa de Servicios Públicos de Heredia (ESPH), provide retail electricity service in the cities of Cartago (around 80,000 inhabitants) and Heredia (37,000), respectively. In addition, 4 electric cooperatives: Coopeguanacasta, Coopelesca, Coopeasantos and Coopealfaro serve isolated systems. ICE provides distribution service in other regions. Together, ICE and CNFL provide more than 80% of the distribution service. Private entities may be</p>

² The limits are basically the capacity of the renewable energy projects developed by the utility plus the energy competitively purchased from other renewable energy projects with no more than 5 MW of capacity cannot exceed the demand requirements of the distribution utility.

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	awarded (new) distribution concessions, but no specific plan to privatize existing distribution concessions has been confirmed.
Targets for Privatization	CNFL's majority interest could be sold to a strategic private investor. New concessions for private operation of generation plants will play an increasing role in new supply capacity.
New Investments	<p>Private investors will perform a major portion of the expansion in Costa Rica. Nevertheless, due to the current private ownership restrictions ICE will directly perform the major projects, including the 177 MW Angostura project.</p> <p>Both the law for the reform of the regulatory institution (Law No. 7329) and the new investment laws opened up new concessions in all areas of activity open to private investors.</p>
IV. Electricity Markets: Areas of Competition and Monopoly	
Bulk Power	<p>ICE currently supplies power on an exclusive basis to all public service enterprises in the country, and is the sole market for the self-generators and IPPs selling power to the public system. No third-party retail sales to large customers or open system access rights are currently permitted. Licenses, concessions, or permits are required for all generation projects under any type of ownership.</p> <p>To date, private investment in power generation plants has been limited to alternative/renewable energy-based units up to 50 MW (originally 20 MW) in size, with an aggregate limit of no more than 30% (originally 15%) of the system's total installed capacity. The proposed law includes provisions that would remove these limits to encourage private sector investment as a complement to public and mixed public-private participation in the generating sub-sector.</p> <p>Even with the creation of a wholesale market with competitive institutional conditions, no competition will occur as long as ICE remains as the major generator in the country. ICE and its subsidiary CNFL generate almost 90% of the total market in the country. Competition will be significantly deterred if the company is not unbundled in both vertical and horizontal terms.</p>
Transmission and Distribution (Networks)	ICE has a monopoly concession for the ownership and operation of the SIN, and sets the interconnection and operating criteria for non-ICE entities. No retail wheeling over the transmission or distribution networks is currently allowed, but these networks will be subject to open, non-discriminatory access under a regulated toll system under the proposed law. ICE will retain exclusive control over the operation and expansion of the interconnected transmission system. ICE will be required to provide connection service to the transmission system to any distribution utility or large consumer requesting it, under established norms. Other entities may also build and own transmission lines and facilities. Distribution concessionaires are responsible for the associated distribution systems.
Retail Distribution	<p>CNFL currently serves about 50% of the total population, concentrated in the San José metropolitan area. ICE, municipal utilities, and rural electric cooperatives have provided service in defined territories. Distribution entities under any kind of ownership require public service concessions, which are issued by ARESEP. The proposed law provides for private participation in distribution activities.</p> <p>Under the proposed law, distribution utilities have the obligation to provide service within their defined territory. Consumers with 1 MW or more of demand can choose whether to be supplied under regulated or deregulated terms, and may change their option with a two-year advanced warning notice to ARESEP. Distribution enterprises will compete with private generators for the deregulated large consumer market.</p>
V. Load Dispatch and Pool Operation	
Dispatch Entity and Basis	<p>ICE sets the criteria for interconnection and performs the system operating functions.</p> <p>Under the proposed legislation, a new entity would be created, the Centro Nacional de Planificación y Operación de Electricidad (CENPO), which would be the new system operator, independent of ICE.</p>
Pool Operation	<p>There is currently no power pool in Costa Rica. ICE, as the national utility is in charge of system operation and the dispatch of the units.</p> <p>The proposed law provides for both a regulated and a deregulated wholesale power market. The</p>

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	<p><i>deregulated market</i> would consist of private generators and distribution utilities (regardless of ownership) selling energy to large consumers (≥ 1 MW) that choose to buy power on the open market. Private generators, including self-generators and cogenerators, could also sell their excess power on a spot market (negotiated) basis to ICE under established guidelines if economically attractive for both parties. International transactions, exclusively under ICE's domain, would be based on negotiated pricing and other terms. Direct sales of energy by privately own generators or self-generators to distribution enterprises would be done under competitive solicitations or otherwise specified conditions (i.e., sales by renewable energy-based generators ≤ 5 MW). ARESEP will define the conditions for a competitive wholesale power (generating) market, set the terms for regulated markets, and generally oversee the proper functioning of both.</p> <p>The <i>regulated bulk power market</i> would consist of both private and public generators with (contractual or other) obligations to the public electricity supply system, such as PPAs with ICE concluded under Law 7200 or new contracts to sell all the output from a generation unit to ICE.</p>
VI. Pricing	
Bulk Power	<p>Rate-setting criteria do not currently incorporate economic efficiency, performance standards, environmental, or energy conservation considerations, but these are factored into pricing in the pending law. Currently, ARESEP sets the prices for purchases from independent generators (for the 15-year contract term) based on the system's avoided costs.</p> <p>The pending law would regulate ICE's wholesale power sales price to distribution enterprises as well as ICE's purchases of energy from independent generators established under Law No. 7200. Suppliers to sell energy to ICE would use tariff schemes through competitive bidding. Deregulated bulk power pricing would apply to generator sales to large consumers subscribing to this manner of power purchase, to international electricity transactions, and to ICE's purchase of excess power from generation enterprises on a spot basis.</p> <p>Formulas for establishing regulated rates for wholesale power sales will be established every 4 years by ARESEP aiming to recover costs and to provide a reasonable profit on activities performed under established efficiency and quality of service criteria. The formulas will consider cost studies, rate proposals prepared by the service providers, and a range of values determined by ARESEP.</p>
Transmission/ Distribution (Networks)	<p>ICE's transmission service costs are bundled with its generation and distribution costs. There are no wheeling services provided under the current system.</p> <p>The pending sector law would require ARESEP to establish a toll system for connections and services provided over the transmission and distribution networks, as well as for load dispatch services. The tolls for transmission access and service would be set to cover the associated investment, administration, operating and maintenance costs, and energy losses over the system. A rate-of-return sufficient to cover capital investment requirements will be assigned. For distribution network services, the charges would be set to cover, on average, the costs of development, administration, operation and maintenance, depreciation, opportunity cost for capital, and the costs of providing service to the client. These costs will be based on the costs that would be incurred by an efficiently operated enterprise in that zone type.</p>
Retail Tariffs	<p>Tariffs have been increased over the past several years to reflect the real costs-of-service. The ARESEP Law (1996) included actual costs-of-service³ as the basis for setting all tariffs and charges in public service areas, with rates issued by decree. Benchmark regulation for distribution entities promotes operational efficiency at this level. Rates can not be applied retroactively. Either service providers or consumers can make semi-annual requests for changes in rates, fees, charges and other prices. Under the proposed sector law, regulated distribution tariffs for end consumers will be based, in principle, on costs-of-service to the consumer. These costs, which are established according to efficient enterprise models, would include the costs of development, administration, and operation and maintenance of the system</p>

³ Actual costs-of-service are defined as investments directly and necessarily made in order to met the requirements for service specified in the concession contract, or by other legal and regulatory requirements.

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	(including metering, billing, and customer services); the costs of standard losses in distribution networks; depreciation costs; and opportunity costs for capital. ARESEP will define a reasonable rate of return for each enterprise considering its efficiency, quality of service, investment program, and other factors.
Subsidies	Improvements in the tariff structure are being promulgated based on the principle of recovering actual costs-of-service within each consumer category. Although removing or reducing consumer cross-subsidies (residential consumers have been subsidized by commercial consumers) is a target, some low-income residential consumers will continue receiving subsidies that cover their basic needs. ARESEP has authority to establish canons or fees to be included in electricity tariffs that will provide funds to cover electrification expansion of and subsidies for low-income consumers.

VII. Sector Problems and Priorities

Framework and Other Issues	<ol style="list-style-type: none"> 1. The government needs to work in bringing more independence to ARESEP. SNE/ARESEP has not had the in-house capability of performing its standard setting and oversight assignments, and remains subject to political intervention (in tariff areas). In the past, the Government has been known to intervene in the implementation of higher tariffs in water and other public service areas, which makes it imperative that ARESEP be removed from the political arena as much as possible. The agency is in charge of too many industries, which does not allow it to fully concentrate in a reform process for the electricity industry. A weak regulatory agency deters the entrance of private investors, as they don't see any agency to defend their interests. 2. ICE's monopoly power remains as a major concern in Costa Rica, it has a major influence in the screening process for new projects, and even under a deregulated industry, its position as major participant in generation and distribution gives it significant power over the industry. This deters further investment by the private sector. 3. Although the sector reforms proposals fall short from the requirements for an integrated competitive market in Central America, their approval in Congress is by no means assured. Failure to pass the Laws, or passing a watered down version, will put in jeopardy not only the modernization of the power sector provision in the country, but also the operation of an integrated electricity market in Central America.
Operating Needs	ICE is considered a well-run, competent enterprise. Increasing the country's generating capacity to meet growing demand is the main issue facing the sector, but the public sector cannot finance such an expansion program. For this specific reason, the Government has specifically sought private participation in the generating sub-sector.
Electrification and Energy Efficiency	Service coverage under ICE has already reached more than 90%. Electrification programs will continue to be under ICE's jurisdiction. A specific fund ("Fondo Solidario de Electrificación" or FOSEL) would be established under the pending law to help fund remaining electrification efforts for low-income areas. ICE and CNFL are undertaking energy efficiency projects with IDB financing among others.

VIII. Sources and Relevant Web Pages

Sources

ECLAC-United Nations, Energy Unit, 1999. "La Industria Eléctrica del Istmo Centroamericano: Situación de los Procesos de Reforma y Perspectivas para el Corto y Mediano Plazo".

Relevant WEB Pages:

Instituto Costarricense de Electricidad (ICE): <http://www.ice.go.cr/>

Compañía Nacional de Fuerza y Luz (CNFL): <http://www.cnfl.go.cr/>

Catholic University of Chile: <http://www.ing.puc.cl/~power/southamerica/southamerica.htm>