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Business Focus Series

Private Power Business Opportunities: Central America

Prepared by:

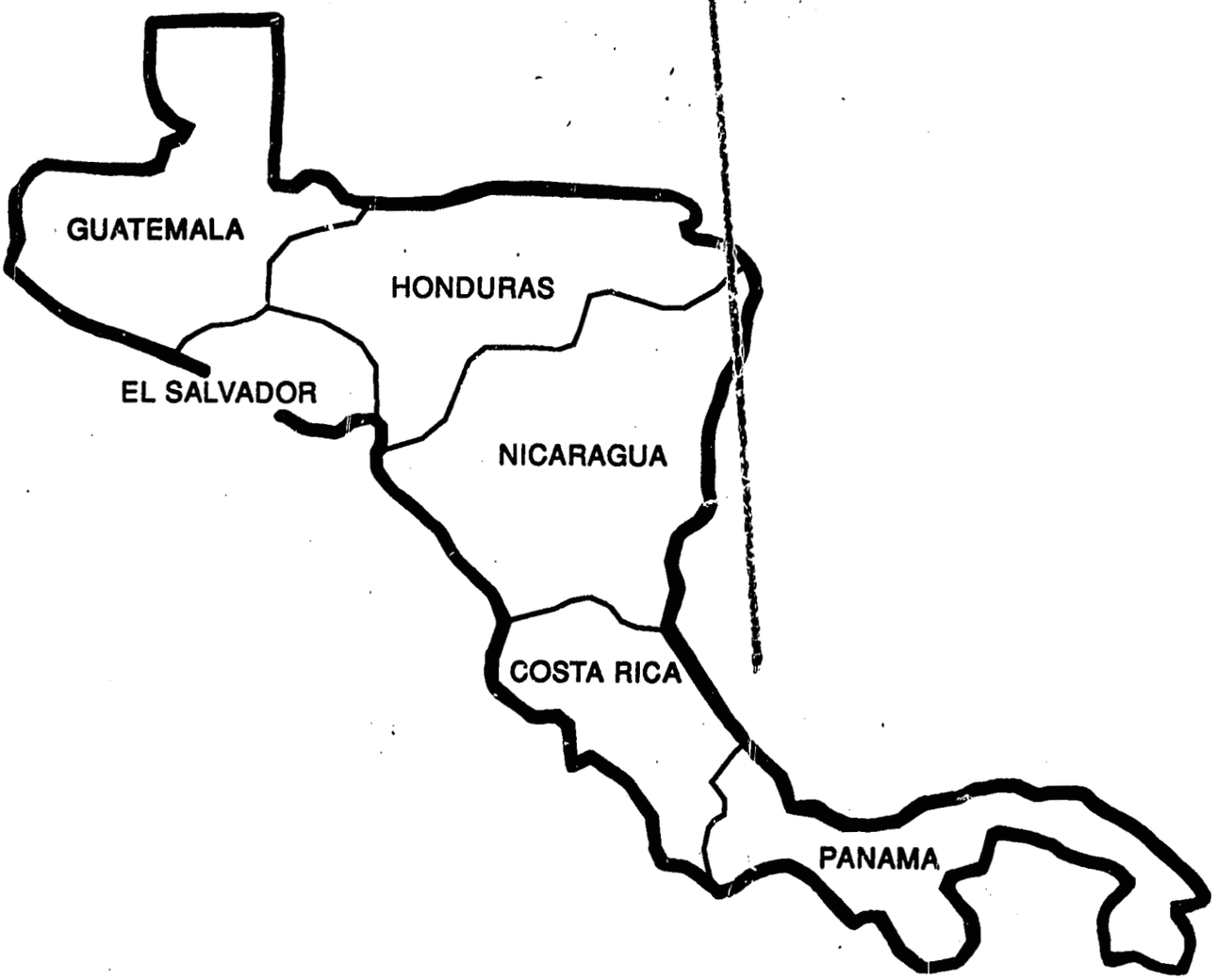
U.S. Agency for International Development

Office of Energy & Infrastructure

in Cooperation with:

Bureau for Latin America and the Caribbean

Private Power Business Opportunities: Central America



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This is one of three reports on private power business opportunities in Latin America. The other two reports examine these opportunities in South America and the Caribbean. These reports are part of the U.S. Agency for International Development's (USAID) Business Focus Series, and were prepared by RCG/Hagler, Bailly, Inc., and JRH Associates. The opinions expressed here are those of the authors and not necessarily those of USAID.

The Business Focus Series includes reports on promising energy and environmental markets and business opportunities in developing countries. The reports are of varying length and content, and may be regional, country-specific, or focused on a particular market segment.

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U.S. Agency for International Development
Office of Energy and Infrastructure
Bureau for Research and Development
1601 North Kent Street, Suite 508
Arlington, Virginia 22209
(703) 875-4052

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Regional Overview

Each of the nations in the region we call Central America (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) will require more electricity to support economic expansion in the coming decade. Countries in the region predict that they will need electricity supply to increase at 6 percent a year in the 1990s to support their economic growth. To support this increase, Central American nations need to add over 1.7 GW of generating capacity by 1999.

Although the public utilities in the region need to expand, they are barely able to meet existing demand owing to serious financial and operational problems. The region's tariff rates are woefully inadequate--public utilities' rates of return on assets have dropped to levels of around 5 percent. Many utilities borrowed heavily from external donors to build new power generation facilities during the past decade, and high inflation and currency devaluations have driven up the cost of repaying their loans. Central governments are subsidizing the utilities to cover their debt service payments, capital investments and, at times, even operating costs.

Governments and public utilities are beginning to reach out to the private sector for assistance. Panama is currently soliciting over 100 MW of private generation capacity. El Salvador is considering a private power solicitation for thermal capacity. Guatemala has accepted a 15-year contract for a 100 MW steam power plant. Nicaragua has discussed generation proposals from private companies. The total market for private power in Central America could reach 1,000 MW between 1992 and 1999.

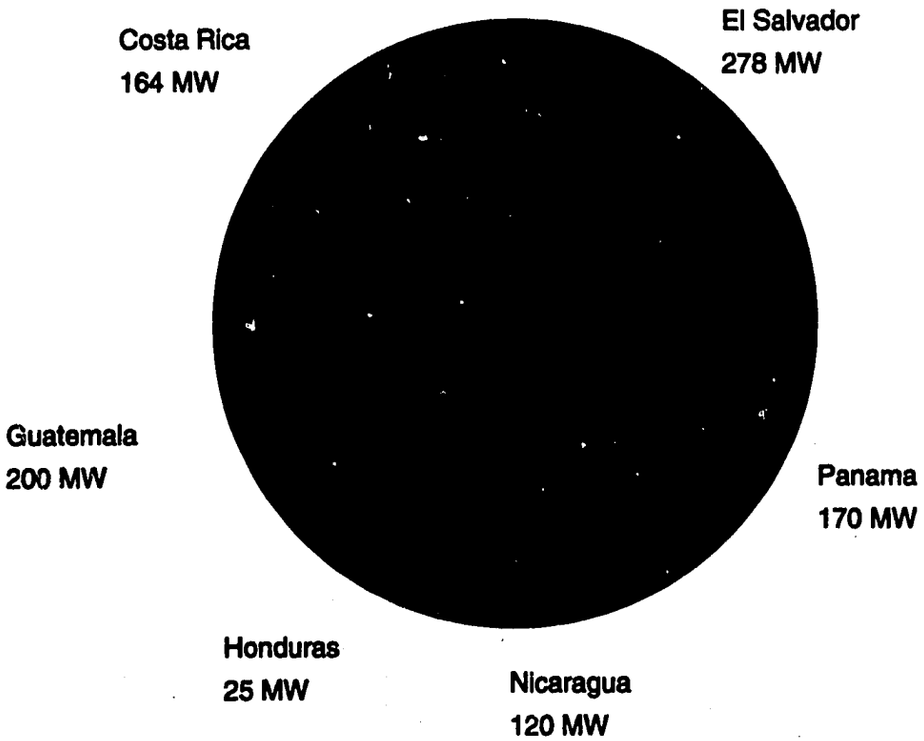
Over the past two years, private developers have proposed more than 1,000 MW of generation capacity in the region. These proposals include power barges for Guatemala and El Salvador, numerous 0.5 to 15 MW hydroelectric and biomass-fired projects in Costa Rica, combined cycle gas turbine projects of various sizes in Panama and El Salvador, and geothermal projects in Nicaragua, El Salvador, and Guatemala. Only a handful of power purchase contracts have been signed to date, however, and few private plants are actually producing power.

Private power generation is a relatively new concept to governments and public utilities in the region (although many of the utilities started out under private ownership and were only nationalized in the 1950s and 1960s). In

Generation Capacity and Potential Private Power Market

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama	Total
Present Capacity (MW)	824	651	654	561	370	879	3,939
Expansion Plans (MW)	560	332	427	100	90	205	1,714
Est. Private Power (MW)	164	250	200	25	120	170	929
Estimated Investment Required	$1,391million	$436 million	$1,323 million	$239 million	$250 million	$218 million	$3,857 million
Estimated Private Power Investments Required	$407 million	$365 million	$200 million	$25 million	$120 million	$170 million	$1,287 million

Estimated Private Power Capacity in Central America, 1989-1999



Source: RCG/Hagler, Bailly, Inc.

many cases, utilities and governments believe that they can shift all commercial and financial risks from themselves to the private sector while offering unrealistically low returns. Private power companies interested in the Central American market must therefore understand local political and economic conditions and be willing to look for long-term rather than short-term results. They must also be willing to spend some time educating their counterparts in the public utilities about how the private power industry operates and about the mutual risk sharing associated with power purchase contracts.

Thermal Electric Power

Thermal electric power production is the most promising area for private power generation in the region. This is especially true in the case of several countries that are overly dependent on hydroelectricity and suffering blackouts as a result of a recent drought. In addition, the high up-front investment required for hydroelectric power will be difficult for many countries to obtain.

Fuel oil and diesel oil are the primary fossil fuels used for thermal generation. With the exception of Guatemala, all the Central American nations are net importers of these fossil fuels. None of these countries' public utilities have coal-fired power plants, although Panama and Costa Rica plan to use coal in the future. For future thermal capacity, Central American nations are looking to diesel-fueled simple and combined-cycle gas turbines, steam-injected gas turbines, slow- and medium-speed diesels, and coal-fired steam plants. Although public utilities are not planning to build fuel oil-fed steam plants, these facilities may prove a viable option for private generators.

Hydroelectric Power

The public utilities in each of the Central American nations project substantial capacity additions through one or two new, large hydroelectric projects in each country. The financial, political, and environmental risks surrounding these projects, combined with their long lead times, make them unlikely candidates for private participation. Nevertheless, there could be a market of about 200 to 250 MW in Central America for small and medium-sized private hydroelectric projects. The niche for private hydroelectric developers will probably be in plants of 1 to 25 MW in Costa Rica, El Salvador, and Guatemala.

Geothermal Power

Geothermal power represents the most uncertain market for private participation, although geothermal resources in Central America are significant. Geothermal power's proportional contribution probably will remain behind that of hydroelectric and thermal electric power generation, but it may still play a major role in the region.

At present, only El Salvador and Costa Rica are projecting any dramatic growth in the use of geothermal power and these countries' utilities may try to reserve their proven geothermal reserves for their own use. Guatemala and Nicaragua may consider allowing private companies a greater role in the development and exploration of the resource.

Transmission and Wheeling

Transmission of electric power in the region is completely controlled by the public utilities. This is likely to remain the case, and private generators will probably have to sell to the public utilities. None of the countries in the region currently allows a private generator to wheel power across their lines to third-party customers. Exceptions may occur in the case of co- and self-generators selling to themselves or to a legally associated group of consumers/owners.

International power sales by a private generator to an adjacent country are also unlikely, although there is currently some regional exchange of electric power. By the late 1990s, the Central American countries plan to be fully interconnected by a 230 kV transmission line from Guatemala to Panama. This will permit increased cross-boundary exchanges or sales of power, although the interconnection will probably not be available to private generators for wheeling power between countries.

The existence of this interconnection is not likely to reduce individual countries' expansion plan capacity requirements. Each country would like to be a net exporter of power if possible because none of the nations wants to be heavily dependent on others for electric power supply.

Panama

Panama's economy is showing positive signs of recovery from the dramatic downturn experienced under the Noriega regime. In 1990, GDP grew at 4 percent and foreign investment began to flow back into Panama. Unfortunately, unanticipated power shortages in 1991 had a chilling effect on hopes for economic recovery.

The Panamanian economy is highly dependent on a well-developed service sector, which contributes nearly 80 percent of the nation's GDP. These service activities include the operation of the Panama Canal, banking, insurance, the transisthmian oil pipeline, and the Colon free trade zone.

President Guillermo Endara's government is imposing tight fiscal discipline, withdrawing banking restrictions, increasing reliance on the private sector, and normalizing relations with external creditor nations. The government is moving to pay off its arrears to the International Monetary Fund, the World Bank, and the InterAmerican Development Bank. It is also making progress in improving the seriously deteriorated network of public services, including the electric supply, water supply system, roadways and ports.

About 6,600 MW of hydroelectric potential have been identified in small, medium, and large sites throughout Panama. The country also has some 360 MW of untapped geothermal resources and significant biomass resources from its sugar industry.

The Electric Power Market

The Instituto de Recursos Hidraulicos y Electrificacion (IRHE) is the state-owned utility responsible for electric power generation, transmission, and distribution (except in the Panama Canal zone and in a few industrial or agricultural complexes outside major urban areas). IRHE can legally contract with other private and public generators. Petroterminales de Panama (the privately owned transisthmian oil pipeline company), the Panama Canal Zone Commission, and the countries of Honduras and Costa Rica currently sell limited amounts of electricity to IRHE. IRHE is managed by a board of directors and reports to the Ministry of Planning and Economic Policy.

IHRE's gross generation was 2,580 GWh in 1989, including its purchases of energy from Honduras and Costa Rica (Panama bought about 6 percent of its electricity from these two nations in that year). The commercial

Panama - Country Statistics

ECONOMIC PROFILE - 1990

POPULATION	2,329,329
growth rate	2.58 %
GDP	$4.816 B
growth rate	4 %
WAGE RATE	Minimum wage is .79/hr.
GDP/CAPITA	$2,070
INFLATION	-0.1 %
EXCHANGE RATE	US $1.00 = B 1.00

TRADE FIGURES - 1990

EXPORTS = $1080 M

sugar, bananas, shrimp and sea products, coffee, clothing and petroleum products

IMPORTS = $1498.3

Major Trading Partners → US, Central America, Europe, Mexico, South America, Japan, Venezuela, and Asia

GENERATION CAPACITY AND POTENTIAL PRIVATE POWER

	1989 (MW)	1999 (MW)	PRIVATE POWER MARKET 1992-1999 (MW)
HYDRO	551	667	50
GEOTHERMAL	0	0	0
OIL	328	417	0
steam	(156)	(145)	12
combustion turbine	(123)	(63)	80
diesel	(49)	(49)	0
combined cycle	0	160	28
COAL	0	0	0
TOTAL	879	1084	170

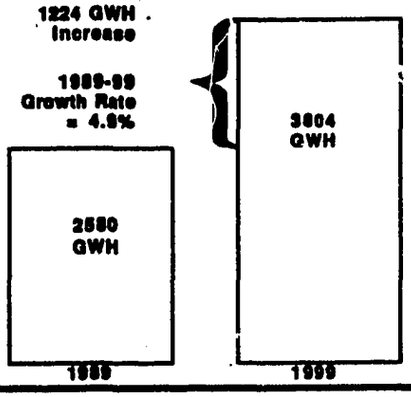
ELECTRIC POWER SYSTEM - 1989

GROSS GENERATION	2580 GWh
ELECTRICITY SALES	2022 GWh
industry share	12 %
PER CAPITA CONSUMPTION	870 kWh
RATE OF RETURN	6.3%
SYSTEM FREQUENCY	60 c/s
transmission	220/115 kV
distribution	34.5/11 kV

ENERGY RESOURCES - 1990

	US $/bbl
IMPORTED OIL	
diesel oil	49.98/bbl
fuel oil	22.43/bbl
HYDROELECTRIC POTENTIAL	6,600 MW
GEOTHERMAL POTENTIAL	360 MW

PUBLIC ELECTRICITY SUPPLY



ELECTRICITY PRICES - 1990

	US CENTS/kWh
TOTAL REVENUE/ TOTAL SALES	11.20/kWh (89)
AVERAGE INCREMENTAL COST	11.20/kWh (91)
TARIFF BY CONSUMER	
Industrial	10.09/kWh
Commercial	11.52/kWh
Residential	12.20 kWh

sector accounted for 22 percent of electricity use in that year, while industry accounted for only 12 percent.

IRHE's generation capacity was 879 MW in 1989, two-thirds of which was supplied by hydroelectric units and one-third by thermal stations. By 1999, IRHE anticipates needing 205 MW of additional capacity. It would like to add 20 MW of thermal capacity by converting its two simple-cycle gas turbines at the Bahia Las Minas station to combined cycle and then add another 80 MW diesel-fed combined cycle unit. Its expansion plan also calls for restoring to service its 40 MW diesel and steam units at the San Francisco station, and adding 80 MW by rehabilitating its steam units at Bahia Las Minas. To meet its demand requirements, IRHE must also spend $45 million during the 1990s to raise the La Fortuna dam by 40 meters to increase its reservoir's holding capacity. As well as updating, refurbishing, and restoring existing units, the utility has three additional projects on the drawing board for completion in 2003. These are a 120 to 150 MW coal-fired station, and two hydroelectric stations of 106 and 80 MW.

With relatively sound electricity pricing (which roughly equals its production costs) and an average tariff rate of over 11 cents/kWh--the highest rate in Central America--IRHE has been able to carry out its hydroelectric power investment plans and meet operational and financial obligations without relying on contributions from the central government. However, in the late 1980s, the Noriega regime ceased payments on the utility's external loans and IRHE now depends on government contributions to pay the arrears. Once these are paid, IRHE should prove one of the stronger public utilities in the region, but the utility's present need to concentrate on its back payments means that it has been unable to invest in maintaining and refurbishing its units.

IRHE's main problems are the low availability of its generating units and the continuing drought that has caused unusually low water levels in the reservoirs supplying the country's hydro plants. The country's La Fortuna 300 MW hydroelectric plant has been unable to deliver at full capacity, which has disrupted the economy. Most of the nation's thermal units are older and in need of refurbishing before they can operate at full capacity. Also, the Panamanian system suffers from low system efficiency, which has been reflected in electricity losses that reached 25 percent in 1989.

Private Power Opportunities

Panama is seeking private participation in expanding its power sector. An estimated 170 MW of power could be available for private generation by 1999. To date, the government has issued three public solicitations for private power projects. Ogden, a U.S. firm, presented a proposal to rehabilitate one of Panama's non-functioning diesel/steam plants, the 40 MW San Francisco station in Panama City. To date, there has been no apparent progress in its negotiations.

In June, 1991, IRHE issued a general request for expressions of interest by the private sector in developing projects in Panama. As well as inviting general ideas for private power generation, the utility specifically requested proposals for any of the hydroelectric and thermal projects in its expansion plan. Twelve companies responded, and IRHE may consider a formal follow-on solicitation.

Because IRHE does not have experience with coal-fired units, the 120 to 150 MW station that is in the utility's expansion plans might be built and operated by the private sector (various Japanese companies, including EPDC, have expressed interest in constructing this facility).

In fall 1991, IRHE issued an emergency bid for the short-term lease of 30 MW of barge-mounted diesel generating capacity to help offset power shortages caused by the drought. Despite numerous expressions of interest, the utility received no bids. Developers cited inadequate time to prepare bids, the lack of available barge-mounted capacity, and the overly short lease period of only two years as reasons for not responding.

Although its forays into private power have been more successful than those of other Central American countries, Panama's government has not fully committed to requiring IRHE to sign a private power contract. This constraint to private power development is exacerbated by IRHE staff's limited experience in dealing with the many contractual price issues that are part of private power projects. IRHE has the most restrictive competitive bid requirements in the region and has to issue competitive solicitations for all procurements. There is therefore little possibility for the utility to contract for private power through unsolicited, negotiated proposals.

Business Practices in Panama

Panama has long operated as a focal point for international trade because of the Panama Canal, and therefore offers substantial investment incentives. Foreign exchange risks are limited by the fact that Panama's currency is the U.S. dollar. The nation has no restrictions on the repatriation of profits and capital and no restriction on foreign ownership of businesses or real estate. Private power plants may even qualify for corporate tax exemptions and/or accelerated depreciation of assets. Further exemptions from import duties and tariffs, real estate taxes, and other fees may be available; if not, IRHE seems willing to treat these as pass-through expenses in any power purchase contract.

Panama offers relatively easy access to short-term funds for project development. There are numerous financial intermediaries in the private sector available to search for local and non-local equity. The USAID Mission in Panama has helped private Panamanian banks establish a $100 million lending facility for development projects. The U.S. government has also placed high priority on using OPIC and U.S. Eximbank lending and guarantee programs to assist with the country's economic recovery. Finally, there is a small but thriving stock exchange that is constantly seeking equities in Panama-based businesses to offer to the public.

Utility Officials

Gonzalo Cordova
Director General
IRHE
Apartado Postal #5285
Panama 4
TEL: (507) 272-100, FAX: (507) 626-437

Government Officials

Laura Subrin
Country Desk Officer, Panama
U.S. Department of Commerce Room 3020
Washington, DC 20230
TEL: (202) 377-2527, FAX: (202) 377-2218

Arturo Garrido
Energy Officer
USAID/Panama City
Agency for International Development
Washington, DC 20521-9100

Angie Velasquez
Commercial Attache, Embassy of Panama
2862 McGill Terrace, NW
Washington, DC 20008
TEL: (202) 483-1407, FAX: (202) 232-2093

Private Organizations

Fred Denton
American Chamber of Commerce and
Industry of Panama
Apartado 168, Estafeta Balboa
Panama City, Panama
TEL: (507) 69-3881, FAX: (507) 23-3508

Rafael Zuniga
Executive Director
Camara de Comercio Panama
Apartado 74
Panama City, Panama

Dominador Kaiser Bazan
President
Fundacion ANDE
P.O. Box 503
Panama 9A

Costa Rica

Costa Rica is unique in Central America. Without a standing army, the country has enjoyed over 40 years of stable democratic rule based on a deeply rooted social security system, universal education, a relatively free market economy, and the highest GDP per capita in the region. This stability has made Costa Rica a leader among Central American countries, and the nation has won respect abroad for the environmental protection measures it is taking to preserve its tropical rainforests.

During the 1980s, Costa Rica suffered from depressed commodity prices for coffee, bananas, sugar, and beef, and from overborrowing for public sector investments. The country had to undergo internal structural adjustments, including the reduction of government subsidies, cuts in government expenditures, increased taxation, and the refinancing of its large external debt (which is the highest per capita in Central America). The government of President Rafael Calderon is continuing these policies to cope with the nation's debt and expand exports. The country has taken measures to attract foreign investment by participating in the Caribbean Basin Initiative, and the Bush Administration's Enterprise for the Americas Initiative.

Costa Rica needs to find financing for future expansion in the electric power sector. Over 90 percent of the country is served with electricity, a far higher rate than other Central American nations. Unlike many of its neighbors, Costa Rica has been spared the recent power shortage problems associated with the drought.

This nation enjoys a huge hydroelectric potential, estimated at 25,450 MW. A limited amount of exploratory work indicates that its geothermal potential may reach 400 MW. Biomass resources, especially from the sugar industry, can provide additional power.

The Electric Power Market

The government-owned utility, Instituto Costarricense de Electricidad (ICE), and its subsidiary, Compania Nacional de Fuerza y Luz (CNFL), supply almost all Costa Rica's electric power. ICE is responsible for generation and transmission; distribution is handled by CNFL in San Jose City, and by two municipal utilities and four rural electrification cooperatives.

Costa Rica - Country Statistics

ECONOMIC PROFILE - 1990

POPULATION	3,032,794
growth rate	3.0 %
GDP	$5.25 B
growth rate	3 %
WAGE RATE	$7.34 - $9.33
GDP/CAPITA	$1,871
INFLATION	10 %
EXCHANGE RATE	US $1.00 = C124.00

TRADE FIGURES - 1990

EXPORTS = $1.37 B

ornamental plants, wood products, bananas, coffee, beer, sugar, pineapples, sea products, clothing and shoes

IMPORTS = $2.05 B

Major Trading Partners → US, EEC, Japan, Mexico, Venezuela

GENERATION CAPACITY AND POTENTIAL PRIVATE POWER

	1989 (MW)	1999 (MW)	PRIVATE POWER MARKET 1992-1999 (MW)
HYDRO	681	1009	50
GEOTHERMAL	0	105	50
OIL	143	248	0
steam	(10)	(10)	
combustion turbine	(80)	(185)	
diesel	(53)	(53)	
combined cycle	0	0	
COAL	0	64	64
TOTAL	824	1425	164

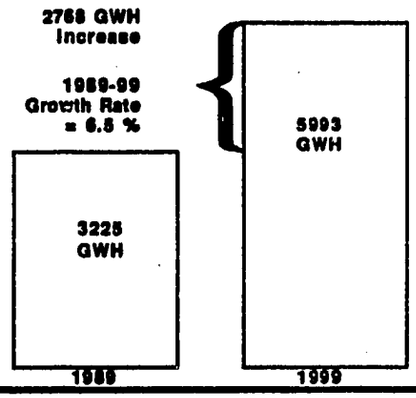
ELECTRIC POWER SYSTEM - 1988

GROSS GENERATION	3052 GWh
ELECTRICITY SALES	2936 GWh
Industry share	24 %
PER CAPITA CONSUMPTION	1099 kWh
RATE OF RETURN	5.5 %
SYSTEM FREQUENCY	60 c/s
VOLTAGE	
transmission	138/34.5 kV
distribution	34.5/24.9/13.2/4.2 kV

ENERGY RESOURCES - 1990

	US $/bbl
IMPORTED OIL	
diesel oil	46.02/bbl
fuel oil	23.38/bbl
HYDROELECTRIC POTENTIAL	25,450 MW
GEOTHERMAL POTENTIAL	400 MW

PUBLIC ELECTRICITY SUPPLY



ELECTRICITY PRICES - 1990

	US CENTS/kWh
TOTAL REVENUE/ TOTAL SALES	5.5/kWh (89)
AVERAGE INCREMENTAL COST	6.50/kWh (91)
AVERAGE RATE CONTRIBUTION TO INCREMENTAL COST	74 %
TARIFF BY CONSUMER	
Industrial	6.33/kWh
Commercial	8.10/kWh
Residential	4.27 kWh

The Ministry of Recursos Naturales, Energia y Minas (MIRENEM) has authority for energy policy and general supervision of ICE. The General Comptroller's office monitors budget and contracting matters, and the Ministry of Planning and Economic Policy approves the utility's investment plans. ICE has authority to negotiate and sign private power purchase contracts.

ICE's generation system is overwhelmingly hydroelectric (83 percent). The remainder of the utility's power comes from thermal capacity. Electricity demand is projected to grow, and ICE will seek to increase its capacity by 75 percent (601 MW) between 1989 and 1999. Plans are for this additional capacity to be 60 percent hydroelectric, with the remainder coming from geothermal and thermal units. ICE has also studied the possibility of a 60-plus MW coal-fired plant on the Caribbean coast, which would run off indigenous lignite or imported coal.

The cost of Costa Rica's ambitious generation expansion program could reach $1,391 million. Without significant loans from multinational lending institutions, ICE will be unable to accomplish its expansion objectives.

By most measures, ICE is a very well managed public utility; its rate of return on assets in was 5.5 percent in 1988 and 6.9 percent in 1989. Its major problem has been its high level of debt. ICE's hydroelectric expansion in the late 1970s and 1980s absorbed a large amount of the nation's resources. Consequently, the sector's debt accounted for 15 percent of the entire public external debt and over 25 percent of the nation's debt service payments in 1988.

Private Power Opportunities

Costa Rica is one of the more advanced Central American nations when it comes to private power generation. A 1990 law promotes the development of small private projects powered by renewable fuels, although this law limits such facilities to less than 20 MW and states that total private power generation cannot exceed 15 percent of ICE's capacity. Private power purchase prices are set annually by ICE and SNE (the independent national electricity commission in charge of regulating electricity tariffs). A clear qualification and application process exists to guide prospective developers.

If ICE permits some private development of its geothermal fields and of the 60-plus MW coal unit, the total private power market could approach 164 MW during the 1990s. However, to date, the utility has indicated that it will retain the geothermal fields and large hydroelectric additions.

Costa Rican companies have submitted 27 independent power proposals (23 small hydro, three bagasse, and one wind) to ICE. These total nearly 150 MW. Five private power developers have executed power purchase contracts and two (the El Viejo sugar mill and a hydroelectric plant) are currently selling power to the utility. Several private companies have formed the Costa Rican Association of Energy Producers (ACOPE) to represent and lobby for private power interests. The association is presently lobbying heavily to raise the private power purchase prices, which were recently set at 4.7 cents/kWh, down from 5.5 cents in 1991.

Despite foreign ownership restrictions (at 35 percent) on private power set in place by the 1990 law, a number of U.S. firms have shown interest in pursuing project opportunities in Costa Rica. Synergics, Inc., of Annapolis, Maryland, is seeking local joint venture partners for a number of hydroelectric projects, and Tondu Energy Systems, Inc., of Houston and Enkar International of San Diego are also interested in hydroelectric possibilities. 3E Engineering of Freemont, California, recently studied the potential of a landfill gas-fired plant near San Jose, and Bioenergy Systems International is pursuing projects using municipal and agricultural wastes.

Business Practices in Costa Rica

Costa Rica has historically favored foreign investment. The incentives it offers, which are generally for export industries, include exemption from income tax on profits for certain exports, accelerated depreciation, duty-free import of equipment and material, and unrestricted repatriation of earnings and capital.

Internal resources for private power funding do exist, but they are limited. Many of the local Costa Rican companies that have proposed private power projects have been willing to commit equity (cash or project sites) toward their development. Some special external sources of funding are available. Since Costa Rica signed the Tax Information Exchange Agreement with the United States, companies may qualify for section 936 tax-free funds from Puerto Rico for development projects at lower-than-market rates of interest. The InterAmerican Development Bank has also established a special long-term lending facility of about $70 million for renewable energy projects.

Possible Contacts

Utility Officials

Hernan Fournier
Executive President
Instituto Costarricense de Electricidad
Apartado Postal 10023
San Jose, Costa Rica
TEL: (506) 207-422 or (506) 207-212

Government Officials

Rodrigo Sotela
Minister-Counselor of Economic Affairs
Judith A. Hernandez
Commercial Attache
Embassy of Costa Rica
1825 Connecticut Ave., NW
Washington, DC
TEL: (202) 234-2945, FAX: (202) 265-4795

Laura Subrin
Country Desk Officer, Costa Rica
U.S. Department of Commerce
Room 3020
Washington, DC 20230
TEL: (202) 377-2527

Heriberto Rodriguez
Energy Officer
USAID/San Jose
Agency for International Development
Washington, DC 20521-3440

Hernan Bravo Trejos
Minister of Natural Resources
Ministry of Natural Resources
Apartado Postal 10026
San Jose, Costa Rica
TEL: (506) 334-533

Private Organizations

Marcos Fernandez Salazar
Director de Proyectos
Industria Nacional de Cemento
P.O. Box 40009
1000 San Jose, Costa Rica
TEL: (506) 213-201

Dr. Carlos Eduardo Robert
Executive Director
Cost Rica Investment & Development
P.O. Box 7170-1000
San Jose, Costa Rica

Emilio Bruce
President
Camara de Comercio de Costa Rica
Apartado 1114-1000
San Jose, Costa Rica
TEL: (506) 210-005 or 337-091

Allison Wanamaker
Executive Director
Costa Rican-American Chamber of Commerce
Apartado 4946
1000 San Jose
Costa Rica
TEL: (506) 20 22 00, FAX: (506) 20 23 00

Bernal Odio
El Viejo Sugar Mill, SA
Carrillo, Guanacaste
Costa Rica

Felipe Ortuno Vicory
President
Association of Costa Rican Energy Producers (ACOPE)
Apartado 557-2200 Coronado
Carrillo, Guanacaste
Costa Rica

El Salvador - Country Statistics

ECONOMIC PROFILE - 1990

POPULATION	5,330,000
growth rate	3.5 %
GDP	$5.4 B
growth rate	3.4 %
WAGE RATE	.50/hr.
GDP/CAPITA	$1,032
INFLATION	19.3 %
EXCHANGE RATE	US $1.00 = 8 Colones

TRADE FIGURES - 1990

EXPORTS = $903.4 M

coffee, sugar, shellfish (shrimp), and apparel

IMPORTS = $1,608.6 M

Major Trading Partners → US, Mexico, Germany, Japan, Venezuela, Canada Brazil

GENERATION CAPACITY AND POTENTIAL PRIVATE POWER

	1989 (MW)	1999 (MW)	PRIVATE POWER MARKET 1992-1999 (MW)
HYDRO	388	470	50
GEOTHERMAL	95	255	100
OIL	168	258	50-100
steam	(63)	(63)	
combustion turbine	(79)	(70)	
diesel	(25)	(25)	
combined cycle	--	(100)	
TOTAL	651	983	200 - 300

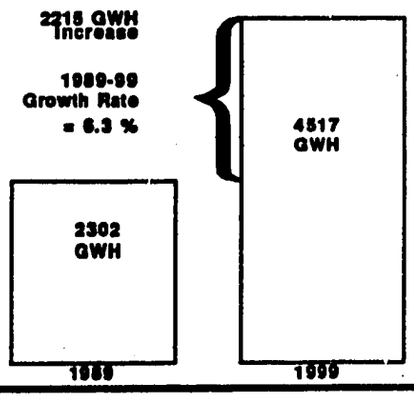
ELECTRIC POWER SYSTEM - 1989

GROSS GENERATION	2302 GWh
ELECTRICITY SALES	1927 GWh
Industry share	31 %
PER CAPITA CONSUMPTION	375 kWh
RATE OF RETURN	5.2 %
SYSTEM FREQUENCY	60 c/s
VOLTAGE	
transmission	115/69/44 kV
distribution	132/44/23 kV

ENERGY RESOURCES - 1990

	US $/bbl
FOSSIL FUEL PRICES	
diesel oil	33.54/bbl
fuel oil	23.60/bbl
HYDROELECTRIC POTENTIAL	1600 MW
GEOTHERMAL POTENTIAL	4260 MW

PUBLIC ELECTRICITY SUPPLY



ELECTRICITY PRICES - 1991

	US CENTS/kWh
TOTAL REVENUE/ TOTAL SALES	4.30/kWh
AVERAGE INCREMENTAL COST	4.60/kWh
TARIFF BY CONSUMER	
Industrial	4.17/kWh
Commercial	4.22/kWh
Residential	3.50/kWh

El Salvador

El Salvador, the most densely populated country in Central America, is poised for a major economic expansion. Optimism over an improved economy is flourishing after a decade of civil strife, and President Alfredo Cristiani has launched an ambitious program of free market policies, including reductions in import tariffs, elimination of price controls, privatization of the banking system, restricted public sector spending, and complete debt restructuring. These policies are having a positive impact. In 1990, real GDP grew by 3.4 percent, imports increased by $100 million, and Central Bank international reserves climbed to $117 million. USAID has committed over $200 million annually to assist with reconstruction and economic recovery.

El Salvador is finding itself unable to keep up with its power needs, however--a situation that is exacerbated by drought-related power shortages. Because the country's industrial users account for about one-third of electricity sales, its national economy will suffer if the power market does not expand.

It is estimated that there are over 1,600 MW of untapped hydro potential in El Salvador, although much of it may not be available as a result of environmental impacts. The nation's geothermal reserves also show significant potential at an estimated 400 MW. The major sugar mills also have access to biomass resources for electric power production.

The Electric Power Market

El Salvador's public utility, the Comision Ejecutiva Hidroelectrica del Rio Lempa (CEL) originally came into being to generate and transmit electric energy, but it now manages most of the country's power distribution as well. CEL is under the jurisdiction of the Ministry of Economy and its budget and expansion plans are reviewed and approved by the Ministry of Planning. The Minister of Economy and an inter-ministerial economic committee approve changes in the tariffs.

Approximately two-thirds of the nation's power is generated by three hydroelectric facilities, all located on the Rio Lempa: Cerron Grande (135 MW), 5 de Noviembre (81 MW), and 15 de Septiembre (157 MW). The reservoir serving the three stations lies behind the Cerron Grande dam. In 1991 the country's electricity supply suffered from unusually low water levels in the reservoir caused by light rainfall during the rainy season (summer and fall). Forecasts indicate that this situation might occur again in 1992. Power rationing put into

effect as a result of the drought highlights CEL's overdependence on hydro power and the inadequacy of its non-hydro capacity.

CEL's thermal capacity is supplied by two steam turbine units that generate 63 MW of power and are located in the Pacific Coast port of Acajutla, three diesel-fired gas turbines totalling 54 MW at Soyapango near the city of San Salvador, and a gas turbine at San Miguel that generates 25 MW. Diesel facilities supply the country with a further 26 MW of power. CEL has an additional 90 MW of installed geothermal capacity at the Ahuachapan field near the Guatemalan border. In addition to power supplied by CEL, El Salvador purchases small quantities of power from Guatemala.

CEL plans to add 332 MW of new generating capacity by 1999. It also plans to retire 39 MW of its gas turbines during the same period. Of the new capacity, 82 MW will result from the expansion of the 5 de Noviembre hydroelectric station, 160 MW will be geothermal, and 100 MW will be from a combined-cycle gas turbine station.

CEL's key problems are financial and operational. The utility lacks the capital resources to rehabilitate and expand its generation capacity and will need an additional $436 million to meet the 1990 target for expansion. CEL requires further capital to repair damages to the transmission system that were caused by the civil war. The utility borrowed substantial sums of money from external sources to cover construction of its three large hydroelectric units. CEL's extremely low tariff rates--about 4 to 4.3 cents/kWh--have made it impossible for the utility to meet its debt service payments without central government contributions (the utility is in fact selling power below production costs). In 1989, CEL's debt service accounted for 28 percent of the Government of El Salvador's entire debt service requirements. To exacerbate the situation, the efficiency of El Salvador's existing power plants has deteriorated owing to delayed maintenance and lack of reliable reserve capacity. Infrastructure problems are also causing difficulties at the Cerron Grande reservoir, which is losing holding capacity due to unexpectedly rapid siltation.

The prospects for CEL's financing and constructing all of the plants to supply the 332 MW of capacity needed by 1999 are not good. Without major funding from the World Bank (which had withdrawn from power sector lending in El Salvador in the 1980s and has just now begun to reconsider projects for financing) and InterAmerican Development Bank, there is no realistic possibility of completing any major hydroelectric expansions in the near future. In

addition, the country's geothermal fields are experiencing reservoir problems and are unlikely to deliver CEL's optimistic projections of their capacity. The utility has also been scrambling for short-term solutions to cope with the blackouts caused by the recent drought.

Private Power Opportunities

The private power market through 1999 could be between 150 and 200 MW. Possible options may include 50 to 100 MW of thermal capacity from such conventional sources as sugar cane waste and municipal waste or small hydro. CEL could also turn the development of its future geothermal fields over to the private sector, adding a market potential of about 50 MW.

Recent government actions appear to favor private participation in the power sector. In June 1991, the government, CEL, and USAID sponsored a conference on private-sector participation in El Salvador's power sector; CEL followed this up by obtaining USAID assistance in requesting private power proposals. With the help of the World Bank and InterAmerican Development Bank, the government and CEL also will be assessing the potential for reprivatizing the distribution companies and possibly even privatizing CEL itself.

In late 1991, CEL received documentation from USAID to facilitate the process of purchasing emergency power from privately operated facilities. However, since then, CEL has decided to install sufficient gas turbine capacity to meet its needs until 1994. Private investment in emergency power will therefore not be necessary before 1994.

The primary opportunity for private power will likely occur in 1992, when CEL considers the solicitation of 50 to 100 MW of thermal, geothermal, and/or hydroelectric capacity. The utility's request for proposals (which includes a draft power purchase agreement) is in the final stages of preparation. Although CEL is most interested in combined-cycle gas turbines, it would consider coal-fired steam plants or low-medium speed diesels using Bunker C. The favored location will probably be near the Port of Acajutla on the Pacific Coast. Sites near San Salvador or major substations may be considered.

CEL has also expressed interest in private participation in geothermal, small hydro (less than 5 MW per unit) and sugar mill cogeneration. The Berlin, Chipilapa, and San Vicente geothermal fields have been mentioned as potential sites for private generation. There is substantial local interest in the numerous small hydro sites in El Salvador, but the utility, concentrating on its

need for major capacity additions of over 50 MW per unit, has not yet decided to solicit proposals for small hydroelectric projects. In 1991 the utility offered sugar mill owners energy-only payments for cogenerated power from their sugar mills, but the mill owners have not found this offer attractive.

To date, CEL has received a few unsolicited private power proposals. Empresa Doble G of El Salvador and International Energy Equities of Colorado submitted an offer to install an 80 MW power barge to help meet El Salvador's immediate power shortage problem and then to install a 118 MW combined-cycle power plant. American & Caribbean International Corp. of Miami and Ingenieria Asociada, S.A. of El Salvador proposed installing a privately owned and operated 70 MW power barge and selling power to CEL. CEL has not responded favorably to these offers, however.

Business Practices in El Salvador

The Foreign Investment Promotion and Guarantee Law assures the free remittance of net profits and capital, and free rein of operation for foreign companies in El Salvador. Foreign investors are given the full protection accorded to local citizens, allowing them to own real property and to operate completely foreign-owned companies in the country. Exemptions from duties and taxes on imported equipment and materials may also be available, or the cost of these can be included as a pass-through in the power purchase agreements. Given its recent history of civil unrest, El Salvador has special programs to provide low-cost insurance against damages due to civil strife.

Except during emergencies, CEL has used competitive bidding to procure needed goods and services. Indications are that it prefers to solicit private power proposals rather than to negotiate unsolicited offers. The utility follows a 45- to 90-day period for advertising and receiving bids.

There are currently no local sources of long-term investment capital for private power projects in El Salvador. USAID is considering providing some capital investment assistance to such projects if CEL will follow through and execute a power purchase contract.

Possible Contacts

Utility Officials

Coronel Sigifredo Ochoa Perez, President
Carlos Hayem, Executive Director
CEL
9a. Calle Poniente No. 850
San Salvador, El Salvador
TEL: (503) 711-876

Government Officials

Jose Louis Trigueros
Commercial Attache
Embassy of El Salvador
1010 16th Street, NW
Washington, DC 20008
TEL: (202) 331-4032

Thomas Welch
Country Desk Officer, El Salvador
U.S. Department of Commerce
Room 3020
Washington, DC 20230
TEL: (202) 377-2527, FAX: (202) 377-2218

Raul Gonzalez
Energy Officer
USAID/San Salvador
Agency for International Development
Washington, DC 20521-3450

Private Organizations

Steven Culbertson
Executive Director
American Chamber of Commerce of El Salvador
65 Avenida Sur, No. 159
P.O. Box (05) 9
San Salvador, El Salvador
TEL: (503) 23-9604, FAX: (503) 24-6856

Eduardo Nunez
Executive Director
FUSADES
Boulevard Santa Elena
Entre Calle Cerro Verde y Calle Oromontique
Antiguo Cuscatlan, El Salvador

Rodrigo Guerra u Guerra
Empresas Doble G
63 Av. Sur, Pje. Santa Monica No. 8
Col. Avila
San Salvador, El Salvador

Arturo Chamorro
American & Caribbean International Corp.
1470 NW 107 Avenue, Suite E
Miami, FL 33172
TEL: (305) 591-2910

Guatemala - Country Statistics

ECONOMIC PROFILE - 1990

POPULATION	9,467,029
growth rate	2.8 %
GDP	$9.41 B
growth rate	3 %
WAGE RATE	Min. wage is $2.00 - $6.00/day
GDP/CAPITA	$850
INFLATION	37 %
EXCHANGE RATE	US $1.00 = Q5.012

TRADE FIGURES - 1990

EXPORTS = $1.593 B

coffee, sugar, cardamon, bananas, and other non-traditional vegetables, and textile and apparel

IMPORTS = $1.998 B

Major Trading Partners → US, Mexico, Germany, Japan, Central America, Venezuela, Italy

GENERATION CAPACITY AND POTENTIAL PRIVATE POWER

	1989 (MW)	1999 (MW)	PRIVATE POWER MARKET 1992-1999 (MW)
HYDRO	426	700	50-100
GEOTHERMAL		70	50
OIL	228	311	50-100
steam	(154)	(137)	
combustion turbine	(50)	(150)	
diesel	(24)	(24)	
combined cycle	--	--	
TOTAL	654	1081	150-250

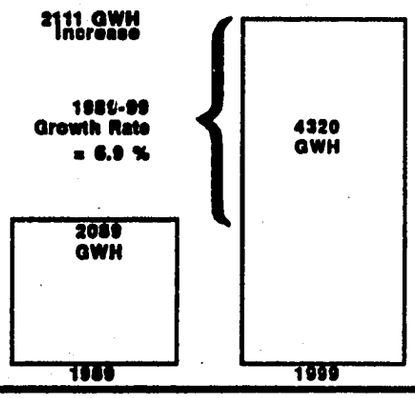
ELECTRIC POWER SYSTEM - 1989

GROSS GENERATION	2089 GWh
ELECTRICITY SALES	1835 GWh
Industry share	34 %
PER CAPITA CONSUMPTION	205 kWh
RATE OF RETURN	14.6 %
SYSTEM FREQUENCY	60 c/s
VOLTAGE	
transmission	230/138/69 kV
distribution	69/50/34.5/22 kV

ENERGY RESOURCES - 1990

	US $/bbl
FOSSIL FUEL PRICES	
diesel oil	28.18/bbl
fuel oil	18.94/bbl
HYDROELECTRIC POTENTIAL	10890 MW
GEOTHERMAL POTENTIAL	1800 MW

PUBLIC ELECTRICITY SUPPLY



ELECTRICITY PRICES - 1991

	US CENTS/kWh
TOTAL REVENUE/ TOTAL SALES	6.10/kWh
AVERAGE INCREMENTAL COST	7.70/kWh
TARIFF BY CONSUMER	
Industrial	5.33/kWh
Commercial	5.53/kWh
Residential	3.65/kWh

Guatemala

Guatemala's economy (the largest in Central America) is dominated by the private sector, which generates nearly 90 percent of the country's GDP. The government's participation in the economy is limited largely to a few public utilities (including electric power), a few development-oriented financial institutions, and a variety of regulatory activities. The country's external debt burden is relatively light, and foreign exchange reserves have climbed considerably over the past two years, reaching $500 million in mid 1991. President Jorge Serrano Elias's key goals are economic development within a market framework, promotion of democratic institutions, and a negotiated settlement of the country's long-standing insurgency.

Agriculture is the mainstay of Guatemala's economy, contributing about a quarter of the nation's GDP and accounting for approximately three quarters of its export earnings. Manufacturing in the nation primarily consists of light assembly and food processing operations geared toward the domestic and Central American markets. Nontraditional exports are growing at over 20 percent annually, reflecting the benefits of Guatemala's participation in the Caribbean Basin Initiative. The United States is Guatemala's largest trading partner and is responsible for 29 percent of Guatemala's exports and 39 percent of its imports.

To the consternation of businesses and industries (who buy approximately a third of the nation's power), Guatemala experienced load shedding in September and October of 1991, the first time in over 10 years. The same drought conditions suffered by other countries in the region reduced hydroelectric production, which accounts for approximately 94 percent of total electricity supply in the country. Guatemala's limited thermal capacity could not fill the gap.

Guatemala has a substantial hydroelectric potential, estimated at 10,890 MW. Its geothermal potential is also large at an estimated 1,800 MW. Also, the local sugar mills can provide biomass resources for power generation.

The Electric Power Market

The Instituto Nacional de Electrificacion (INDE), its subsidiary Empresa Electrica de Guatemala S.A. (EEGSA), and ten small municipal utilities provide public electricity in Guatemala. INDE is legally responsible for power generation

and transmission, rural electrification, supply of bulk electricity, and retail distribution outside the major cities. The Ministry of Energy and Mines (MEM) supervises INDE and EEGSA, sets energy policy, and approves tariffs.

Guatemala's installed power generation capacity of 654 MW is dominated by two relatively modern hydroelectric plants, Chixoy (300 MW) and Aguacapa (90 MW). In 1989, hydroelectric plants accounted for 94 percent of the total supply. The remainder of Guatemala's electricity is supplied by older thermal units. Although utility expansion plans will be a major drain on the central government, INDE and EEGSA recently have used the drought situation to their advantage to obtain funds for emergency purchases. These utilities recently purchased a 50 MW steam-injected gas turbine unit from Stewart and Stevenson of Houston to help mitigate power rationing instituted by the utility in reaction to the drought.

To keep pace with projected economic growth, INDE is proposing a diversified expansion of generation capacity. Between 1989 and 1999, the utility hopes to add 274 MW of hydro, 70 MW of geothermal and 311 MW of thermal power. This expansion plan probably underestimates the need for additional thermal capacity due to the need for major rehabilitation and/or replacement of existing thermal units (it plans to retire some 48 MW by 1995).

INDE is suffering financial difficulties due to the substantial debt service on loans for its hydroelectric facilities and the erosion of its tariff levels in real terms (its current tariffs are 5.33 cents/kWh for industrial customers, 5.53 cents/kWh for commercial customers, and 3.65 cents/kWh for residential customers). During the 1980s, the power sector was responsible for approximately 15 percent of Guatemala's total debt service requirements. Projections are that, to meet its capacity requirements for 1999, the power sector will require $1,323 million.

Aside from its financial problems, INDE faces operational challenges. Until recently, over-dependence on hydroelectric power caused INDE to neglect the maintenance and expansion of its thermal capacity. Furthermore, structural problems with the Chixoy dam threaten to reduce available capacity dramatically. The utility also suffers from internal organizational problems that have resulted in a loss of qualified personnel.

Private Power Opportunities

In response to power shortages and problems in obtaining investment capital, the Ministry of Energy and Mines, INDE, EEGSA, and USAID sponsored a meeting on private power in September 1991. Despite attendance by high-level Guatemalan government officials, international development bank representatives, and local private companies, no substantive long-term commitments were made to adding private power generators to the INDE/EEGSA system. However, INDE is apparently willing to discuss proposals.

One driving force for private generation is the sugar mill owners' desire to establish a second source of revenue. They have approached INDE and EEGSA seeking long-term purchase contracts to supply power. INDE is apparently willing to pay only for energy and not for any additional capacity that the millers want to install to upgrade and expand their plants. Pantaleon--the nation's largest private sugar plantation--is currently selling excess power to INDE for just the energy payment, with no payment for capacity. The pressure from the sugar mill owners has helped educate the staff at INDE and EEGSA about the legal and financial requirements for private power. If INDE and EEGSA could reach agreement with the mill owners on a capacity payment, then the mill owners would commit substantial funds to acquire additional generating equipment.

The leaders of Guatemala's public utilities have demonstrated their political and bureaucratic will to pursue the private power option. INDE has accepted a private power proposal from a Houston company to install a barge-mounted, 100 MW steam plant on the Pacific. Finally, INDE might be willing to consider private development of the geothermal projects at Zunil and Amatitlan, which are projected to be able to produce up to 60 to 70 MW.

The existing legal structure for the electric power sector would need formal changes to make private power fully legal. Regulations on the right of private companies to own and operate plants that sell power to INDE or EEGSA are cloudy, and clarification of water rights and ownership of mineral resources will be necessary for private producers interested in hydroelectric and geothermal power.

Business Practices in Guatemala

Most of the investment incentives in Guatemala are designed to attract investment in export-producing enterprises. However, if the government were to find private power generation a priority, then special legislation or administrative action could result in a project developer's obtaining some of these incentives, which include limited financing by government development institutions, suspension of tariffs and duties on imported equipment and materials, and possible relief from income taxes.

Although competitive bidding is the common practice for INDE and EEGSA, there is apparently some latitude that allowed the utility to receive the 100 MW barge proposal without full international competitive bidding.

There are no significant internal sources of long-term funding for private power projects in Guatemala. However, financial institutions in the country offer short-term lending at market rates.

Possible Contacts

Utility Officials

Alfonso Rodriguez Anker
President
EEGSA
Zona 1, Apartado 209
Gautemala City, Guatemala
TEL: (502) 2-300-659

Ing. Javier Alberto de Leon Obiols
Executive Director
INDE
7a. Avenida 2-29, Zona 9,Nivel Menos 2
Guatemala City, Guatemala
TEL: (502) 2-345-058

Government Officials

Ing. Carlos Leonel Hurtarte
Minister of Energy and Mines
Diagonal 17 Entre Calle 28, Zona 11
Guatemala City, Guatemala
TEL: (502) 2-760-679

Jose Orive Jr.
Economic Counselor
Embassy of Guatemala
2220 R Street, NW
Washington, DC 20008
TEL: (202) 332-7393

Lic. Richard Aitkenhead Castillo
Minister of Finance
Centro Civico, Zona 1
Guatemala City, Guatemala
TEL: (502) 2-511-393

Thomas Welch
Country Desk Officer, Guatemala
U.S. Department of Commerce, Rm 3020
Washington, DC 20230
TEL: (202) 377-2527, FAX: (202) 377-2218

Mario Funes
Energy Officer and Regional Officer for
Central American Programs
Agency for International Development
Washington, DC 20521-3190

Private Organizations

Ignacio Silva Villa
President
American Chamber of Commerce in
Guatemala
Apartado Postal 832
7 Avenida 14-44, Zona 9
Nivel 2, Oficina 19
Guatemala, Guatemala
TEL: (502) 2-312-235, FAX: (502) 2-312-235

Susann Egli de Sandoval
Executive Director
AMCHAM-Guatemala
12 Calle 1-25, Zona 10
Edificio Geminis, Torre Norte
12 Nivel, of. 1206
Guatemala City, Guatemala
TEL: (502) 2-353-355, FAX: (502) 2-353-372

Manuel Yarhi
President
Fundacion par el Desarrollo de Guatemala
(FUNDESA)
Edificio Carara de Industria
Apartado Postal 350A
Guatemala City, Guatemala
TEL: (502) 2-318-584,FAX: (502) 2-341-090

Guillermo Gonzalez
Director
Camara de Industria
Ruta 6 9-12 Zona 4
Guatemala City, Guatemala
TEL: (502) 2-316-513, FAX: (502) 2-346-878

Nicaragua - Country Statistics

ECONOMIC PROFILE - 1990

POPULATION	3,900,000
growth rate	3.4 %
GDP	$1.1 B
growth rate	0.1 %
WAGE RATE	n/a
GDP/CAPITA	$284
INFLATION	1.7 %
EXCHANGE RATE	US $1.00 = 1.00 Gold Codoba

TRADE FIGURES - 1990

EXPORTS = $327 M

coffee, cotton, bananas, meat, seafood (crustaceans), sugar

IMPORTS = $568 M

Major Trading Partners → Europe, Japan, CACM, Mexico

GENERATION CAPACITY AND POTENTIAL PRIVATE POWER

	1989 (MW)	1999 (MW)	PRIVATE POWER MARKET 1992-1999 (MW)
HYDRO	100	100	
GEOTHERMAL	70	150	70
OIL	200	210	50
steam	(175)	(145)	
combustion turbine	(15)	(65)	
diesel	(10)	(0)	
combined cycle	-	-	
TOTAL	370	460	120

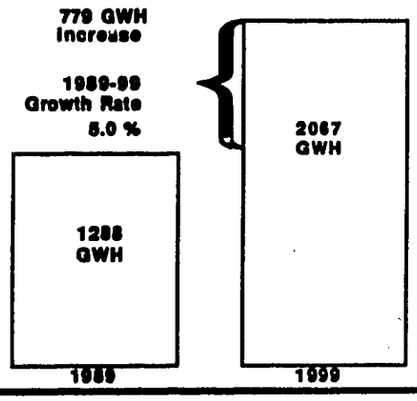
ELECTRIC POWER SYSTEM - 1989

GROSS GENERATION	1288 GWh
ELECTRICITY SALES	997 GWh
industry share	28 %
PER CAPITA CONSUMPTION	266 kWh
RATE OF RETURN	0 %
SYSTEM FREQUENCY	60 c/s
VOLTAGE	
transmission	138/69 kV
distribution	25/13.8 kV

ENERGY RESOURCES - 1990

	US $/bbl
IMPORTED FOSSIL FUEL PRICES	
diesel oil	49.48/bbl
fuel oil	25.12/bbl
HYDROELECTRIC POTENTIAL	5050 MW
GEOTHERMAL POTENTIAL	2000 MW

PUBLIC ELECTRICITY SUPPLY



ELECTRICITY PRICES - 1991

	US CENTS/kWh
TOTAL REVENUE/ TOTAL SALES	5.00/kWh
AVERAGE INCREMENTAL COST	N/A
TARIFF BY CONSUMER	
Industrial	6.64/kWh
Commercial	9.68/kWh
Residential	6.60/kWh

Nicaragua

Since taking office in April 1990, President Violeta Chamorro has made major strides in establishing a market-driven economy through new legislation to privatize banking, increased incentives for foreign investment, re-establishment of free trade zones, export promotion, and reduced import and export restrictions. Inflation is now down to 1 percent per month and, in 1990, real GDP improved slightly after five years of negative growth.

Nicaragua's government has instituted a stabilization and structural reform program that includes reductions in central government spending, privatization of state-owned property and businesses, devaluation of the currency, payment of arrears to the World Bank and InterAmerican Development Bank, and renegotiation of foreign debt with bilateral and commercial lenders.

Nicaragua's civil unrest during the 1980s and the withdrawal of funds from the previous Sandinista government by international lenders crippled the economy, which depressed the demand for electric power throughout the nation. Nicaragua faces serious problems in supplying sufficient electric power to support its social and economic revitalization. Demand for electricity is projected to grow at a rate that will require increasing capacity to 460 MW by 1999--possibly a conservative estimate.

Nicaragua has a substantial endowment of renewable energy. Its hydroelectric potential is estimated at 5,050 MW and its geothermal potential at 2,000 MW. Biomass from its sugarcane mills is also an energy option.

The Electric Power Market

The Instituto Nicaraguense de Energia (INE) is the government utility responsible for electricity generation, transmission and distribution. Nicaragua is interconnected with Honduras and Costa Rica via 230 kV lines and often imports electricity from these two countries.

Organizationally, INE reports directly to the President of the Republic although the utility falls under the legal authority of a ministry director.

INE's installed capacity was 370 MW in 1989. The utility's generation sources are 54 percent thermal/diesel, 28 percent thermal (primarily steam turbines), 27 percent hydro, and 19 percent geothermal. The major power installation is Plant Managua with two 15 MW oil-fired steam units and one 45

MW oil-fired unit. The two smaller units require major refurbishment or replacement. Recently, ICE, the government utility of Costa Rica, installed a 30 MW diesel plant at the Nicaraguan border on the Atlantic Ocean, primarily to export power to this isolated area of Nicaragua.

By 1999, Nicaragua plans to expand its capacity by 90 MW, at a cost of $250 million. This very conservative estimate reflects the difficulties INE faces in financing its future expansion plans. INE currently has geothermal units at Momotombo that total about 70 MW. The utility plans to expand production at this field by adding between 35 and 100 MW. A second field may have the potential for 150 to 200 MW. The utility has major plans for hydroelectric power plants that it hopes to bring on line after 2000. The largest hydro project under discussion is the Copalar hydroelectric station, a 450 MW unit in North Central Nicaragua. INE is also considering a 250 MW low-head hydroelectric plant on the San Juan River and a 25 MW hydroelectric dam known as the Y-Y project in the state of Zelaya, which would provide power to the gold mine operation near the towns of Siuna, Rosita and Bonanza.

The public utility suffers from mounting debt service payments, a situation that has diverted capital from investment in additional system capacity. The electricity tariffs in Nicaragua (6.64 cents/kWh for industrial customers in 1991) have only been sufficient to cover INE's operating costs, not its debt service requirements. This utility had a zero percent rate of return on assets in 1989 .The civil unrest of the 1980s caused substantial damage to and deterioration in existing generation, transmission, and distribution facilities. Operational inefficiencies include low availability of thermal units, possible overemployment, and high electricity losses (19 percent in 1989).

Private Power Opportunities

Nicaragua has over 5,000 MW of hydroelectric and 2,000 MW of geothermal potential. The Nicaraguan government recently instituted substantial incentives to attract foreign investment that would apply to private power investments. To date, the Chamorro government has held negotiations with at least two U.S. companies regarding private-sector ownership of future generation units and some of the state's existing thermal units.

U.S. companies have indicated some interest in private power projects in Nicaragua. SEI, the independent subsidiary of Southern Electric, negotiated a letter of intent with the government to obtain a right of first refusal

to construct certain units of future generating capacity and to rehabilitate and operate some existing units. Additional progress has apparently not been made on firming up this arrangement. UNOCAL also has done some preliminary work in exploring the potential for participating in Nicaragua's geothermal development program. If the country's economy grows rapidly, there may also be some limited opportunities for third-party supply of power directly to selected industries.

Business Practices in Nicaragua

Nicaragua's current legal system does not allow private power generation. Given the present government's commitment to private sector participation, however, the existing law could be modified to permit private ownership and operation of generating plants. INE follows traditional utility procurement practices of competitive bidding. There are indications that the government and INE might consider negotiated contracts for particular private power projects, but this has not yet been adequately tested.

The country's new foreign investment law guarantees foreign investors all rights equal to those of Nicaraguan citizens, repatriation of 100 percent of invested capital after three years, 100 percent of net profit, and a minimum of 10 years' operation without expropriation of property.

The export promotion law, although targeted toward export industries that create additional employment and revenue for the national economy, may also have provisions applicable to investments in a power generation plant. These would have to be negotiated on a case-by-case basis. Incentives include reductions in the corporate tax rate from 38 percent to 15 percent and simplified import and export procedures.

There are no significant internal sources of financing for private power projects. The few commercial banks could prove a source of short-term working capital in local currency. The biggest obstacle to private power development in Nicaragua is the lack of foreign currency and the difficulty of converting the currency.

Possible Contacts

Utility Officials

Emilio Rapaccioli
President
Instituto Nicaraguense de Energia
Managua Nicaragua
TEL: (505) 2-726-8081

Government Officials

Laura Subrin
Country Desk Officer, Nicaragua
U.S. Department of Commerce
Room 3020
Washington, DC 20230
TEL: (202) 377-2527, FAX: (202) 377-2218

Ing. Amilcar Ibarra
Economic Consul
Embassy of Nicaragua
1627 New Hampshire Ave.
Washington, DC 20008
TEL: (202) 939-6531

Private Organizations

Consejo Superio de la Empresa Privada
Apartado Postal 5410
Managua, Nicaragua

Marlies Weimer
Executive Director
American Chamber of Commerce
Apartado 202
Managua, Nicaragua
TEL: (5052) 66-62-84
FAX: (505) 2-66-15-84

Lic. Juan Lopez Zeledon
Camara de Comercio de Nicaragua
Apartado Postal 135
Managua, Nicaragua
TEL: (505) 2-704-12

Instituto Nicaraguense de Desarrollo
Montoya 1 C. al lago 1/2 abajo
Apartado 2598
Managua, Nicaragua

Honduras

Honduras is one of the poorest countries in Central America. Since taking office in January 1990, President Rafael Callejas has implemented an economic stabilization program to improve economic growth. The country's currency has been devalued, customs tariffs lowered dramatically, government expenditures cut, and debt restructuring completed.

Increased domestic prices due to Honduras's currency devaluation and reductions in price controls on fuel (including a 60 percent increase in electricity tariffs) have depressed domestic demand and temporarily slowed growth. Per capita income in 1990 was 18 percent less than in 1989. Inflation in 1990 reached a rate of 36.5 percent. Although GDP only declined by 1 percent, depressed prices for bananas and coffee--Honduras's major exports--brought foreign exchange earnings down in 1990.

The Honduran economy is based largely on agriculture. The United States is the country's chief trading partner, supplying about 40 percent of imports and purchasing about 54 percent of Honduran exports. U.S. companies account for about 85 percent of total direct foreign investment in Honduras: approximately $208 million as of 1988. These investments are concentrated in banana production, oil refining, and lead/zinc mining.

Estimates of Honduras' non-conventional energy resources show substantial opportunities for additional hydroelectric power. Not all of the estimated 3,600 MW of hydro potential would be financially or environmentally feasible to develop, however. Little attention has been paid to the nation's 120 MW of geothermal potential. Biomass resources from the sugar and wood products industries can fuel additional generating capacity.

The Electric Power Market

Empresa Nacional de Energia Electrica (ENEE) is the primary utility responsible for the generation transmission and distribution of electricity in Honduras. A few isolated municipal utilities and a privately owned utility serving the island of Guanaja in the Caribbean provide some power to the country. ENEE comes under the jurisdiction of the Ministry of Communication, Public Works, and Transportation, which approves electricity planning, budgeting and tariffs.

Honduras - Country Statistics

ECONOMIC PROFILE - 1990

POPULATION	4,800,000
growth rate	3.2 %
GDP	$4.9 B
growth rate	-1 %
WAGE RATE	$2.88 - $3.15/day in manf.
GDP/CAPITA	$1,040
INFLATION	36.5 %
EXCHANGE RATE	US $1.00 = L5.30

TRADE FIGURES - 1990

EXPORTS = $1080 M

bananas, coffee, lumber, sugar, meat and fish, minerals, tobacco, cotton, shrimp and lobster

IMPORTS = $1489.3 M

Major Trading Partners → US, Mexico, Germany, Japan, Venezuela, UK, Italy, Brazil, France and Spain

GENERATION CAPACITY AND POTENTIAL PRIVATE POWER

	1989 (MW)	1999 (MW)	PRIVATE POWER MARKET 1992-1999 (MW)
HYDRO	423	423	
GEOTHERMAL	--	--	
OIL	137	237	
steam	--	--	
combustion turbine	(29)	(129)	
diesel	(108)	(108)	25
combined cycle	--	--	
TOTAL	561	661	25

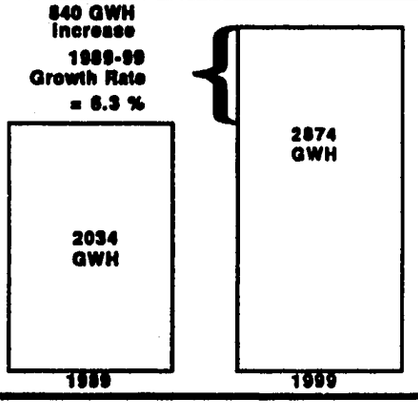
ELECTRIC POWER SYSTEM - 1988

GROSS GENERATION	2034 GWh
ELECTRICITY SALES	1351 GWh
industry share	37 %
PER CAPITA CONSUMPTION	271 kWh
RATE OF RETURN	4.8 %
SYSTEM FREQUENCY	60 c/s
VOLTAGE	
transmission	138/69 kV
distribution	34.5/13.8/4.2/2.4 kV

ENERGY RESOURCES - 1990

	US $/bbl
FOSSIL FUEL PRICES	
diesel oil	45.87/bbl
fuel oil	24.85/bbl
HYDROELECTRIC POTENTIAL	3600 MW
GEOTHERMAL POTENTIAL	120 MW

PUBLIC ELECTRICITY SUPPLY



ELECTRICITY PRICES - 1990

	US CENTS/kWh
TOTAL REVENUE/ TOTAL SALES	8.50/kWh
AVERAGE INCREMENTAL COST	6.10/kWh
TARIFF BY CONSUMER	
Industrial	5.30/kWh
Commercial	6.08/kWh
Residential	5.88/kWh

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Honduras is interconnected with Nicaragua, Costa Rica and Panama through a 230 kV line and sells excess power to these countries whenever possible.

In 1989, ENEE had 561 MW of generating capacity with 75 percent being hydroelectric. The 292 MW El Cajon and the 80 MW Rio Lindo hydroelectric stations dominate the system. Of the nation's 137 MW of thermal/diesel capacity, 24 percent is from combustion turbines (a 15 MW and a 14 MW unit installed in the early 1970's) and 76 percent are diesels (108 MW).

The average revenue from the sale of power by ENEE in 1990 (8.50 cents/kWh) was well above the estimated long-run incremental cost (6.10 cents/kWh). Revenues were further bolstered by exports of electricity. Nevertheless, ENEE's financial condition is weak as a result of the recent devaluation and debt incurred in financing the El Cajon project. In 1989, the power sector was responsible for almost 20 percent of national debt. The accumulated arrears on debt service in the power and other sectors forced the government to request major financial restructuring from its international creditors, which was accomplished in 1990. Due to low tariff rates, high losses (25 percent in 1988), and nonpayment of bills, ENEE's rate of return on assets has steadily declined from about 9.6 percent in 1972 to 4.8 percent in 1988. The utility was recently forced to cease its practice of providing free electricity to the public sector. ENEE plans to add 100 MW of combustion turbines to its thermal capacity by 1999 to provide diversity to its generating system. Additional, large hydroelectric units are planned to come on line beginning in 2000. During the 1990s, some of the existing diesel capacity, which serves remote locations that are not connected to the national transmission grid, will also need replacement.

Private Power Opportunities

To date, ENEE and the government of Honduras have expressed little interest in private power generation. ENEE intends to build, own, and operate all future generating capacity. The excess capacity at El Cajon offers the utility the comfort of not having to undertake immediate capacity additions--an option that is not available to most other countries in Central America.

The opportunity for private power development in Honduras is therefore limited. The only opening may be provision of some of the replacement diesel capacity in the non-grid connected locations. This situation could change

if the government decides not to allow ENEE to incur more debt for its expansion or if diversification concerns demand development of new fuel sources. Opportunities do exist for a small amount of private self generation in Honduras in isolated locations--this amounted to some 29 MW in 1989.

Estimates of nonconventional energy sources show opportunities for additional hydroelectric power. Not all of this 3,600 MW potential would be financially or environmentally feasible to develop, however. Little attention has been paid to geothermal resources due to plentiful hydroelectric resources, although the country has identified reserves of at least 120 MW.

Business Practices in Honduras

The Honduran government encourages foreign private investment, but the current legal situation is ambiguous. In December 1989, the first law to regulate foreign investment passed with several restrictive provisions, including a four-year wait before repatriating dividends and capital. The Callejas government has chosen not to enforce the law and is seeking to liberalize it. Also, there is severe lack of foreign exchange and a thriving black market. Fiscal and customs incentives for investors are only available in the few industrial park and free trade zones. Until the foreign investment law is modified, Honduras will remain relatively uncompetitive in comparison with other Central American countries.

Possible Contacts

Utility Officials

General Manager
Empresa Nacional de Energia Electrica
Apartado 99
Tegucigalpa,Honduras

Government Officials

Lic. Benjamin Zapata
Economic Counselor
Embassy of Honduras
3007 Tilden St., NW
Washington, DC 20008
TEL: (202) 966-7702, FAX: (202) 966-9751

Thomas Welch
Country Desk Officer, Honduras
U.S. Department of Commerce Room 3020
Washington, DC 20230
TEL: (202) 377-2527, FAX: (202) 377-2218

Hugo E. Elvir Castillo
Acting Energy Officer
USAID/Tegucigalpa
Agency for International Development
Washington, DC 20520-3480

Private Organizations

Sonia Reyes de Madro
General Manager
Honduran-American Chamber of Commerce
Hotel Honduras Maya
Apartado Postal 1838
Tegucigalpa, Honduras
TEL: (504) 32-31-91, FAX: (504) 32-20-31

Norman Garcia
President
Foundation for Investment and Development of Exports
P.O. Box 2029
Tegucigalpa, Honduras

National Industrialist Associations (ANDI)
Edificio la Interamericana
Boulevard Morazan, 5 Piso
Tegucigalpa, Honduras