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## Regional Indicators: Central America

Although Central America (including Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) has limited energy resources, it is important to world energy markets as a transit center for oil (via the Panama Canal), and as a potential energy transit center between North and South America.

Note: This information is latest available as of September 2004, and is subject to change.



### BACKGROUND

Central America is home to some of the world's poorest and most densely populated countries. Nicaragua and Honduras, for example, are considered two of the poorest countries in the Western Hemisphere, with large portions of their populations living in poverty. Both of these countries are part of the World Bank and International Monetary Fund (IMF)-led Heavily Indebted Poor Countries (HIPC) initiative, which provides

comprehensive debt relief to the world's poorest, most heavily indebted countries. The economic situation is not as dire in all Central American countries, such as in Costa Rica, where the population enjoys a relatively high standard of living, with the highest per capita income in the region and low unemployment.

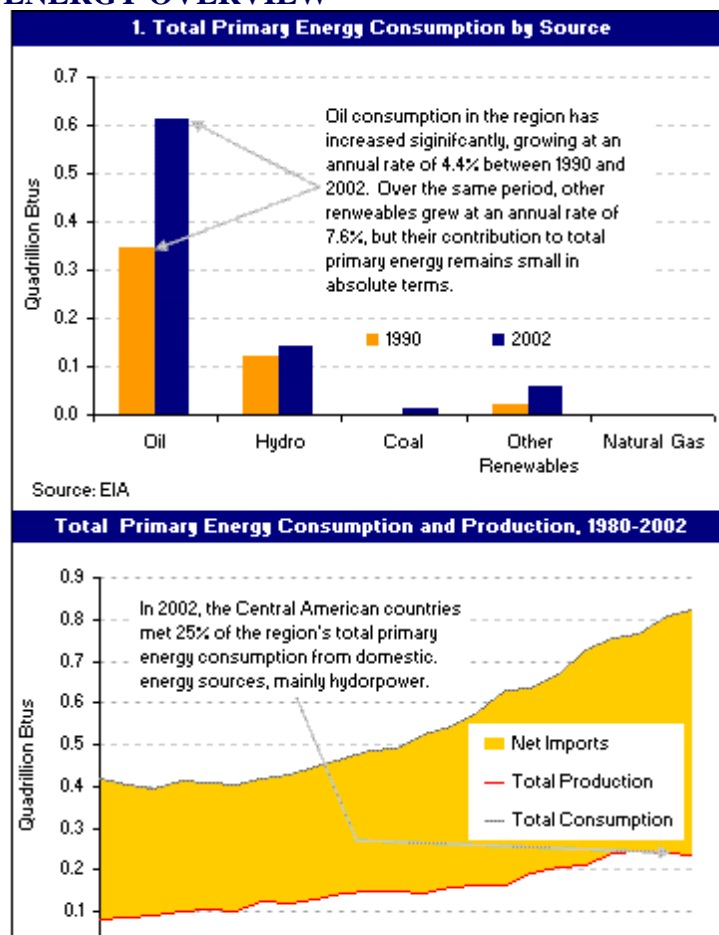
Traditionally, Central American countries have been reliant on agricultural exports (e.g., coffee, sugar and bananas) to generate a large portion of their gross domestic product (GDP). During the past decade, however, most Central American countries have been developing new growth sectors in order to diversify their economies, such as non-traditional exports and so-called maquila industries (assembly of products, mainly textiles and apparel, for re-export). This transition has been particularly evident in El Salvador, where, in 2003, only 3.4% of the country's export earnings came

from coffee, compared to more than half in 1988. In place of traditional industries, Costa Rica has been able to attract private investment, including large companies like Intel Corporation and Proctor and Gamble. In addition, remittances from Central Americans working abroad have increasingly contributed to the region's economies. Although most Central American countries have made great strides to diversify, agriculture still plays an important role in their economies.

In 2003, all Central American economies expanded year-on-year, with El Salvador and Guatemala growing at the slowest rates. In the short term, Central America will likely benefit from a resurgent economy in the United States, the region's main trading partner, and from an upswing in world commodity prices. The [Dominican Republic-Central American Free Trade Agreement](#) (DR-CAFTA) with the United States, signed on August 5, 2004, will also likely boost the region's economic prospects once it is ratified by participating governments and implemented.

Over the past few years, significant progress has been made in Central American economic integration. In May 2000, after four years of negotiations, the three "northern triangle" countries (El Salvador, Guatemala, and Honduras) signed a free trade agreement with Mexico. Since March 2000, the "northern triangle" countries have been negotiating a trade agreement with the Andean Community (Bolivia, Colombia, Ecuador, Peru, and Venezuela). A final agreement to interconnect the electricity networks of the Central American countries was signed in December 2001, allowing for regional power trading among the member states beginning in 2006 (see below). This integration of electricity grids is only one of several initiatives by the Inter-American Development Bank's Puebla-Panama Plan, which seeks to promote regional development and integration of Central American countries with Mexico.

## ENERGY OVERVIEW



With almost no domestic hydrocarbon reserves (oil, natural gas and coal), all seven Central American countries rely heavily on imported energy plus indigenous hydropower to meet their domestic energy demand. In 2002, the countries met only 25% of the region's total primary energy consumption from domestic energy sources. Of all the countries, Costa Rica was the most self-sufficient, meeting nearly 50% of its total primary energy consumption in 2002. Oil was Central America's main source of energy, accounting for 77% of the region's total primary energy consumption in 2002 (see graph 1). Historically, hydroelectric power has dominated Central America's electricity sector; however, since opening up to foreign investors in the middle to late 1990s, thermal generation has grown rapidly. Although the diversification of power supply has had a positive impact on these countries, there still are problems, as hydropower remains susceptible to droughts and the price of oil can fluctuate.

In a move to increase energy supply security, Central American countries have been integrating their electricity grids. This project, known as the Puebla-Panama Plan, aims to reduce prices and to minimize supply disruptions.

## OIL

### Production

Guatemala is Central America's only oil producing country. In 2003, Guatemala produced an estimated 22,000 barrels per day (bbl/d) of crude oil, up 22% from the previous year. Guatemala's 526 million barrels of proven oil reserves are located primarily in the country's northern jungles of the Petén basin. For much of the twentieth century, civil war precluded the development of Guatemala's hydrocarbon resources. After the government signed peace accords in December 1996, ending a 36-year internal conflict, oil production in Guatemala increased, reaching 23,767 bbl/d in 1998. Prior to the peace agreements, guerrilla groups constantly attacked oil companies, hindering oil exploration and production activities. The French company Perenco controls most of the [oil operations](#) in Guatemala, including a 275-mile crude oil pipeline and storage and loading facilities.

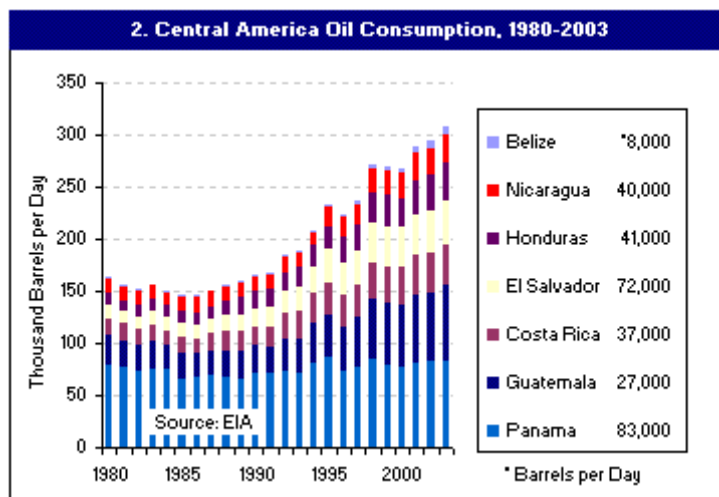
### Nicaragua and Costa Rica

In May 2003, Nicaragua's Director General of Hydrocarbons (DGH) awarded exploration and production (E&P) concessions to four U.S.-based companies - MKJ Exploration International, Greathouse Year 2000 Trust, Infinity Inc., and Industria Oklahoma Nicaragua, a subsidiary of Empire Energy Corporation International. DGH finalized a concession agreement with Industria Oklahoma Nicaragua on April 23, 2004. The company expects to submit a preliminary environmental report to the government by the end of October 2004. As of September 2004, DGH was still negotiating with Infinity and MKJ Exploration International, while the Nicaraguan government annulled its concession with Greathouse Year 2000 Trust, reportedly due to internal problems at the company.

In November 1999, U.S.-based Harken Energy began a seismic acquisition program offshore from Costa Rica. Despite identifying potential oil prospects, the Costa Rica government has repeatedly denied Harken regulatory approval to commence drilling operations. Harken reportedly has been unable to attain the necessary regulatory approval to proceed with exploration activities and continues to negotiate with the Costa Rican government.

### Consumption

Oil consumption in Central America has nearly doubled since 1980, reaching 308,000 bbl/d in 2003. Over the past two decades, oil has been Central America's main source of energy, despite the absence of any significant domestic crude oil reserves. Increased use of oil and diesel-fired power plants, as well as economic expansion have contributed to Central America's rising consumption of oil. In 2003, Panama was the region's largest consumer of oil, at 83,000 bbl/d, while Belize was the smallest consumer, at 8,000 bbl/d (see graph 2).



Central America's oil imports are supplied primarily by Mexico and Venezuela under the San Jose Pact and the Caracas Energy Accord. The San Jose Pact, originally implemented in 1980 and

renewed annually, commits Venezuela and Mexico to provide all seven Central American countries and four Caribbean countries with 160,000 bbl/d of crude oil and petroleum products under preferential financial terms. Under the Caracas Energy Accord, agreed to in October of 2000, Venezuela agreed to supply additional oil to Central American and Caribbean countries at preferential prices and terms for the next 15 years. Nicaragua, El Salvador, and Costa Rica are the only countries with crude oil refining capacity in Central America. Panama and Guatemala closed their refineries in 2002.

### **PANAMA CANAL/PIPELINE**

At present, Central America's main importance from an international energy perspective is as a transit center for oil shipments via the Panama Canal. In 2003, approximately 444,000 bbl/d of crude oil and petroleum products passed through the Panama Canal, with around 65% of total oil shipments moving south from the Atlantic to the Pacific. In accordance with the September 1977 Panama Canal Treaty, Panama assumed full responsibility for the Canal at noon on December 31, 1999. At that time, the U.S. Panama Canal Commission was replaced by a new Panamanian entity, the Panama Canal Authority. The Treaty guarantees permanent neutrality of the Canal.

### **Other Oil Transport Infrastructure**

#### ***Trans-Panama Pipeline***

In November 2003, Petroterminal de Panama, the owner of the [Trans-Panama pipeline](#), reactivated the line, which had been out of operation since 1996. The company signed a contract with Taurus Petroleum Limited to transport up to 100,000 bbl/d of Ecuadorian crude from the Pacific to a Caribbean port for distribution to refineries in the region. The pipeline was originally constructed to facilitate the transportation of Alaskan North Slope Crude oil (ANSKO) from Valdez, Alaska to refineries on the Gulf coast of the United States, as the very large crude carriers (VLCCs) which transported Alaskan crude could not transit the Panama Canal. From 1982 to 1996, the pipeline transported an estimated 2.5 billion barrels of oil.

#### ***New Oil Infrastructure***

In January 2003, U.S.-based Phenix Pipeline and Oleoductos Premier de Nicaragua announced plans to build a [pipeline](#) across Nicaragua to transport petroleum products between the coasts. The Central American Pipeline Project (282 miles long) would begin at Monkey Point and end at Port of Corinto. The project also includes the construction of two marine terminals, with each having 2 million barrels of storage capacity. Completion of the project was set for 2004.

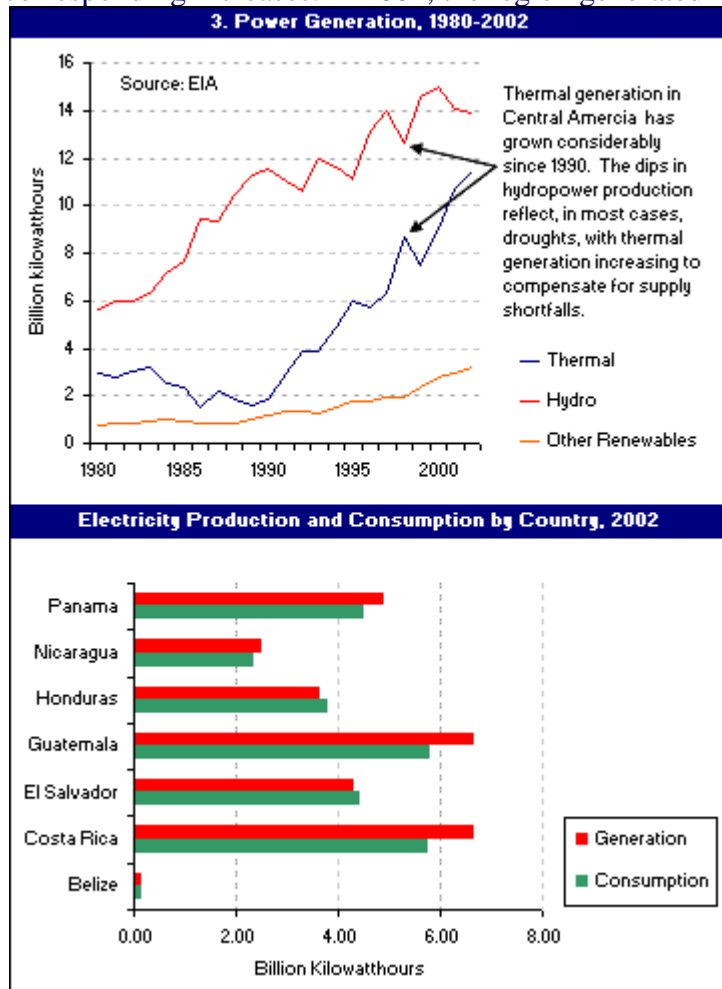
### **NATURAL GAS**

Currently, Central America consumes no natural gas. In December 1999, however, Guatemala and Mexico signed a protocol agreeing to construct a natural gas pipeline connecting Jaltiplan de Morelos, in southern Mexico, to Puerto Quetzal in Guatemala. The pipeline eventually could be extended to the Honduran and Salvadoran borders, and possibly to Nicaragua and Costa Rica, as part of a wider Central America natural gas pipeline network. Since signing the protocol, progress on the project has been limited, but, in May 2004, Mexican government announced that it would like to revive the project.

### **ELECTRICITY**

Power consumption and generation in Central America have grown rapidly over the past decades, spurred on by economic expansion and increased electrification of many rural areas. Between 1980 and 2002, power consumption in Central America grew at an annual rate of 4.8%. During 1993-2002, Guatemala, the region's largest consumer and generator of electricity, experienced the fastest annual electricity demand growth, at 5.5%, while Belize actually had a negative rate of growth (-1.8%). In 2002, the region consumed 26.5 billion kilowatthours (Bkwh), up 1.3% year-on-year.

Electricity generation in Central America, historically dominated by hydropower, has had corresponding increases. In 2002, the region generated 28.6 Bkwh, up 3.1% year-on-year.



Hydropower accounted for 49% of electricity generated, with thermal and other renewables providing 40% and 11%, respectively. Facing energy shortages in the mid-to-late 1990s, Central American countries began privatizing their energy markets, allowing foreign investors to develop new power plants. Many of the new power plants were thermal as construction time is shorter in comparison to hydropower plants. As a result, thermal generation has been growing faster than hydropower generation (see graph 3). Between 1980 and 2002, installed electric generation capacity in Central America grew from 2.7 gigawatts (GW) to 7.5 GW.

### Belize

Belize Electricity Limited (BEL) is the main generator, distributor, and transmitter of electricity in the country. BEL receives about 54% of its electricity from Comisión Federal de Electricidad (CFE), Mexico's national power company, and from the Belize Electricity Company Limited (BECOL), a wholly-owned subsidiary of Fortis Incorporated. BECOL owns and operates the 25-megawatt (MW)

Mollejon hydroelectric facility, the only dam currently in operation in Belize. BECOL sells all the power generated from the dam to BEL under a 50-year purchasing power agreement (PPA). BEL, in which Fortis has 67% stake, generates the rest of the country's electricity from diesel-fired power plants.

In mid-2005, BEL expects to complete the 5.3-MW Chalillo hydropower project. The project has been controversial, with Belizean environmental groups trying repeatedly to block BEL from completing the facility. In November 2003, BEL finalized a 15-year PPA with U.S.-based Hydro Maya Limited, which will build, own and operate a 2.8 MW hydropower plant. Also in 2003, BELCOGEN, a subsidiary of Belize Sugar Industries, proposed building a 13.5-MW plant, which would run off both oil and bagasse. BEL reportedly finalized price negotiations with BELCOGEN in late 2003, and is now waiting for approval from the Public Utilities Commission to commence with the project. BEL hopes that these projects will help diversify the country's power supply, lessening its dependence on power from Mexico and on oil imports.

### Costa Rica

Costa Rica is nearly self-sufficient in power, generating 99% of its electricity from domestic energy sources in 2002. Hydropower was Costa Rica's largest energy source, accounting for 84% of country's power in 2002. Other renewables (mainly geothermal) and thermal provided 15% and 1%, respectively, of the country's total power in 2002. Costa Rica also generated a small percentage of its electricity from wind.

Between 1983 and 2002, Costa Rica's demand for electricity grew at an annual rate of 4.7%. According to state-owned utility Instituto Costarricense de Electricidad (ICE), Costa Rica's demand for power is expected to continue to grow, from 7.9 Bkwh in 2004 to 17.9 Bkwh in 2020 (Costa Rica's electricity demand in 2002 was 5.7 Bkwh). During 2004-2020, ICE expects that the country's installed electric generating capacity will have to grow by 2.0 GW in order to meet the rise in demand.(see [Costa Rica's 2004-2020 energy policy](#)).

### ***Sector Organization***

Costa Rica's electricity sector is dominated by ICE, which provides more than 80% of the country's electricity. Independent power producers generate the remaining power for Costa Rica. A subsidiary of ICE, Compañía Nacional de Fuerza y Luz, handles distribution.

### **El Salvador**

El Salvador is Central America's largest producer of geothermal energy. In 2003, the country produced 0.97 Bkwh of geothermal electricity, representing approximately 21.9% of total electricity generated, according to government statistics. Thermal sources and hydropower accounted for 37.5% and 33.1%, respectively, of electricity generated in 2003. Power imports from Guatemala and Honduras accounted for the remainder. Currently, there are two geothermal facilities operating in El Salvador, the 95-MW Ahuachapán, and the 66-MW Berlín. Majority state-owned power company LaGeo, formerly Gesal, operates the two plants. LaGeo is currently expanding the two existing geothermal plants, as well as conducting a feasibility study for a third plant, Cuyanausul. The three projects are expected to add 64 MW of installed electric generating capacity by mid-2006. Along with the two geothermal facilities, there were 7 thermal plants and 4 hydropower plants in operation as of December 2003.

### ***Sector Organization***

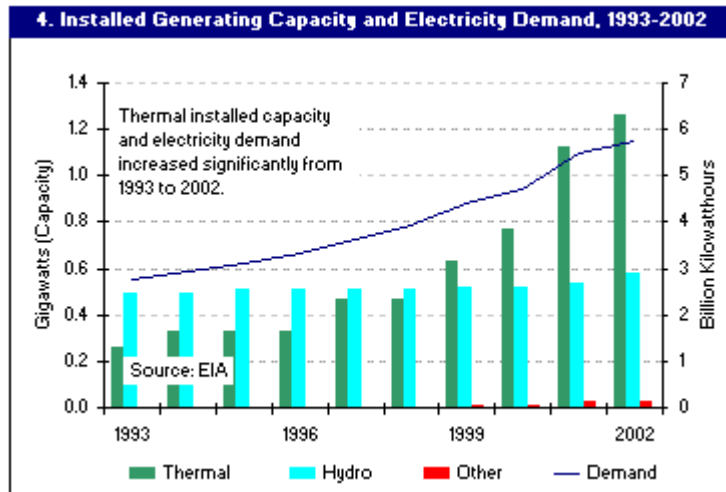
In 1995, the Salvadoran National Assembly approved regulation to privatize the country's state-owned utility company, Comisión Ejecutiva Hidroeléctrica del Río Lempa (CEL). In 1998, the government began selling majority stakes in CEL's five power distribution companies, and, as of December 2003, AES Energy Corporation controlled four of them: Compañía de Luz Eléctrica de Santa Ana; Compañía de Alumbrado Eléctrica de San Salvador; Empresa Eléctrica del Oriente; and Distribuidora Eléctrica de Usulután Sociedad de Economía Mixta. Emel of Chile, a subsidiary of Pennsylvania Power and Light Global, operates El Salvador's fifth distributor - Distribuidora de Electricidad. In the following year, the government created Gesal, now known as LaGeo, to operate the country's geothermal power plants and Empresa Transmisora de El Salvador (ETESAL) to maintain the country's transmission lines, as well as interconnectors to Guatemala and to Honduras. ETESAL remains state-owned, despite efforts to privatize it, while Enel of Italy owns a small stake in LaGeo. The government sold stakes in some of CEL's thermal generation assets, namely the Acajutla and Salvadoreña plants, to Duke Energy in 1999. An independent agency to regulate the wholesale market, La Unidad de Transacciones, was also created, along with the Superintendencia General de Electricidad y Telecomunicaciones, which sets and regulates tariffs for transmission, distribution and power.

### **Guatemala**

Since the mid-1980s, Guatemala's demand for power has increased significantly, from 1.5 Bkwh in 1985 to 5.8 Bkwh in 2002 (an annual growth rate of 7.1%). This rise in demand was mainly due to economic growth and to increased electrification of the country.

In 1991, a period of electricity rationing prompted the Guatemalan government to sign contracts with private suppliers to meet the country's power requirements. In 1992, the government signed a contract with Enron to build the 110-MW Puerto Quetzal plant (a barge with mounted diesel

generators). In the following years, continued power supply constraints forced the government to issue more power supply contracts. From 1993 to 2002, thermal installed generation capacity grew nearly 400%. Along with increased thermal generating capacity, Guatemala added two geothermal-powered plants, the 5-MW Calderas in 1998, and the 24-MW Zunil 1 in 1999. During the same period, hydro installed electric generating capacity remained essentially static (see graph 4).



### Sector Organization

In October 1996, the Guatemalan government approved the General Electricity Law (Decree 93), requiring the key (national) sector enterprises - Empresa Eléctrica de Guatemala Sociedad Anónima (EEGSA) and Instituto Nacional de Electrificación (INDE) - to separate commercialization, distribution, transmission and generation functions within one year of its enactment. In 1997, EEGSA sold its generation assets to Grupo Generador de Guatemala y Cia (owned by Duke Energy since 2001). In 1998, the company divested 80% of its distribution assets to a consortium comprising Iberdrola (Spain), TECO Power Services (U.S.), and Portugal's Electricidade de Portugal (Portugal). In the same year, INDE split its distribution assets, creating two regional companies - Distribuidora Eléctrica de Occidente and Distribuidora Eléctrica de Oriente - which Union Fenosa (Spain) subsequently acquired. INDE has retained control of its generation and transmission assets, which are held as legally distinct companies, allowed under the Electricity Law. There also are 13 municipally owned distribution companies which serve their regions. The Electricity Law created a regulatory agency (La Comisión Nacional de Energía Eléctrica) and wholesale power market administration (Administrador del Mercado Mayorista).

### Honduras

In 2003, Honduras generated 57% of its electricity from thermal sources, 36% from hydropower, and 0.33% from biomass, according to the country's state-owned energy company, Empresa Nacional de Energía Eléctrica (ENEE). Electricity imports from Costa Rica and Panama made up the remainder. In 2003, over half of Honduras' hydropower was generated from the 300-MW Francisco Morazán hydroelectric dam (formerly known as El Cajón). As of December 2003, there were 14 thermal powered plants, 9 hydropower plants, and 4 biomass plants in operation in Honduras, according to government statistics.

Similar to the other Central American countries, Honduras has been facing surging power demand, as well as potential power shortages due to underperforming hydropower plants. In 1998, for example, an El Niño induced drought forced the Honduran government to declare an energy emergency. Since then, Honduran government has been trying to diversify its power supply, awarding concessions for the construction of thermal power plants. In October 2003, for example, the Honduran government approved a contract with Luz y Fuerza de San Lorenzo (LUFUSSA) to build new power plant. LUFUSSA has completed the first phase of its 250.7 MW power plant, known as Pavana. The plant will run on heavy fuel oil. Other new developments include the expansion of Empresa Energía Renovable's (ENERSA) diesel-fired Choloma III power plant, which will have an installed electric generating capacity of 230 MW upon completion in mid-2005. A much more ambitious project, proposed by AES, was discontinued in April 2003. AES proposed building a 580-MW a gas-fired power plant and a liquefied natural gas import terminal.

The Honduran government has not abandoned hydropower, however, and plans to bid a contract to construct the 100-MW Piedras Amarillas hydro plant by the end of 2004. The government also expects to increase generation capacity from biomass and wind. ENEE is currently working with the private company, Zond de Honduras, to build a wind park, with 60 MW of installed capacity.

### ***Sector Organization***

In 1994, the government introduced legislation (Ley Marco) to reform Honduras' electricity sector, creating an electricity regulator and a ministerial energy cabinet to address policy issues. The legislation also allowed IPPs to generate power, selling output to ENEE. In 2003, IPPs produced more than 50% of the country's power. Nonetheless, ENEE remains in control of most of Honduras' power sector, i.e., distribution and transmission. There have been indications that the government would like to further privatize ENEE but it remains unclear when and whether this will materialize.

### **Nicaragua**

In 2002, fossil fuels were used to generate 81% of Nicaragua's power, with hydropower accounting for 8.5% and other renewables (mainly geothermal) for the remainder. Geothermal power plays a small but increasing role in Nicaragua's energy mix, particularly since the government has been trying to decrease its dependence on imported oil to generate electricity. The country currently has one geothermal power plant in operation - Momotombo. ORMAT has been operating the plant since 1999 and has a 15-year PPA with state-owned utility Empresa Nicaragüense de Electricidad (ENEL). A second geothermal power plant – the San Jacinto-Tizate – is under construction, with the first phase of the project expected to be completed in January 2005, producing 10 MW per year. On completion in 2007, the San Jacinto-Tizate is expected to produce 66 MW per year. Polaris Geothermal Incorporated is building the plant and will sell the power produced from San Jacinto-Tizate to Union Fenosa, the operator of Nicaragua's two main power distributors.

The government is currently looking to expand geothermal power generating capacity. On September 16, 2004, Nicaragua's energy regulator, Instituto Nicaragüense de Energía (INE), issued a call for proposals for two geothermal projects: the 250-MW Hoyo Monte Galán; and the 150-MW Managua-Chiltepe. INE expects to announce the winners of the tenders in March 2005.

Similar to its neighboring countries, electrification of rural areas remains a major initiative of the Nicaraguan government. In May 2003, the World Bank approved a \$12 million loan to finance off-grid rural areas. According to the plan, some 16,000 households in isolated, rural communities in the Central and Atlantic regions of Nicaragua will have electric light and power for the first time. This is part of the country's National Rural Electrification Program, which aims to bring power to 70% of the country's rural areas by 2005 and to 90% by 2012.

### ***Sector Organization***

In 1998, the Nicaraguan Government enacted the Electricity Industry Act (Ley de la Industria Eléctrica – Law no. 272), calling for the separation of generation, distribution and transmission assets from state-owned utility ENEL. In October 2000, Spain's Union Fenosa acquired controlling interests in Disnorte and Dissur, Nicaragua's two electricity distribution firms. The two distributors cover most of the country's domestic power market. ENEL retains a small distributor, known as Bluefields, as well as some operations in isolated areas of the country.

The Nicaraguan government has only been able to privatize two of Enel's power generation assets: Generadora Momotombo to ORMAT in June 1999; and Generadora Eléctrica Occidental to Coastal Power, a subsidiary of El Paso Energy Corporation, in February 2002. El Paso also operates the 51-MW Tipitapa Power Company. ENEL's other two generation assets - Generadora Eléctrica Central



and Generadora Hidroeléctrica – remain state-owned. There are also 32 small, publicly-owned power producers which serve areas not connected to the country's main power grid. All of these power plants are diesel-fired. The government created Empresa Nacional de Transmisión Eléctrica (ENTRESA), which is responsible for maintaining the country's transmission lines and international interconnectors. ENTRESA will remain state-owned, as mandated by Law 272. The Centro Nacional de Despacho de Carga is responsible for administrating Nicaragua's power market (Mercado Eléctrico de Nicaragua) and grid.

### Panama

In 2002, Panama generated an estimated 4.9 Bkwh of electricity, of which 50.1% was generated from hydro, 49.5% from thermal sources and 0.4% from other renewables. Panama generates more than it consumes, exporting its electricity to neighboring countries, mainly to Costa Rica.

### Sector Organization

In 1998, the Panamanian government restructured its electricity sector, separating generation, distribution and transmission assets of state-owned power company, Instituto de Recursos Hidraulicos y Electrificación (IRHE). The government partially privatized four power plants belonging to IRHE: the 300-MW EGE Fortuna (El Paso Energy 25% stake and Hydro Québec 16.3% stake); the 90-MW EGE Chiriquí (AES 49% stake); the 150-MW EGE Bayano (AES 49% stake); and the 285-MW Bahia Las Minas (Enron 51% stake, now managed by PrismaEnergy). The Panamanian government retained the remaining shares in the companies, with employees allowed to acquire up to 2%. Union Fenosa acquired stakes in two of IRHE's three distributors: Empresa de Distribución Eléctrica Metro Oeste (Edemet); and Empresa de Distribución Eléctrica Chiriquí (Edechi). Union Fenosa also acquired their limited combined generation capacity of 26 MW. U.S.-based Constellation Energy acquired the third distribution unit, Elektra Noreste. The government retained control of Panama's transmission company - Empresa de Transmisión Eléctrica (ETESA). A regulatory body, Ente Regulador, was also created to oversee the electric, telecommunications, and water sectors.

### Energy Integration (Plan Puebla-Panama)



In December 2001, the Central American countries signed an agreement to integrate their electricity grids, creating a regional wholesale electricity market (Mercado Eléctrico Regional - MER). The first stage of the project is constructing the Sistema de Interconexión Eléctrica de los Países América Central (SIEPAC), a 1,144-mile transmission line interconnecting

Panama, Costa Rica, Honduras, Nicaragua, El Salvador, and Guatemala. Two institutions and one company were created to administer, regulate and construct SIEPAC: a regional regulatory agency (Comisión Regional de Interconexión Eléctrica); a operator and administer of the power market (Ente Operador Regional); and a company responsible for constructing and maintaining the

transmission lines (Empresa Proprietaria de la Red). The SIEPAC system is expected to be operational in 2006.

Under the Puebla-Panama Plan, interconnectors are planned to link SIEPAC with the electricity grids of southern Mexico and Belize. The first interconnector will integrate Mexico with the Central American electricity market by constructing a 62.5-mile transmission line between the sub-stations of Tapachula, Mexico and Los Brillantes, Guatemala. On May 20, 2003, Mexico and Guatemala signed an energy integration accord to develop this interconnection. The line is expected to be operational by 2005. The second interconnector will link Belize's electricity network with the Central American system. The project involves constructing a 122-mile, 230-kilovolt power transmission line between substations in Santa Elena, Guatemala and in Belize City. It is expected that SIEPAC increase security of supply, reduce the cost of electricity and attract foreign investment.

## ENVIRONMENT

Central America remains one of the world's poorest regions. This has encouraged massive exploitation of the area's natural resource base. Large areas of forest have been cut down and burned for firewood or used in the production of paper, while significant portions of land have been cleared for agricultural use. Oil exploration activities in certain parts of Guatemala, such as the northern Petén rainforest region, have encouraged road construction, accelerating the clearing of land and forested areas. These activities have led to large-scale erosion and soil loss, leaving many areas vulnerable to flash floods and mudslides as the natural landscape's ability to retain water is jeopardized. Oil is the chief source of energy in most areas of Central America, and pollution from cars, industry, and power generation is a major problem in several areas.

	Gross Domestic Product (GDP)				Population 2003E (Millions)
	2003E (Billions of U.S. \$)	Real GDP Growth Rate		Nominal Per Capita GDP, 2003E	
		2003 Estimate	2004 Forecast		
<b>Belize</b>	<b>0.9</b>	<b>9.4%</b>	<b>3.8%</b>	<b>\$3,611</b>	<b>0.3</b>
<b>Costa Rica</b>	<b>17.4</b>	<b>6.5%</b>	<b>3.9%</b>	<b>\$4,307</b>	<b>4.0</b>
<b>El Salvador</b>	<b>15.0</b>	<b>1.8%</b>	<b>1.8%</b>	<b>\$2,258</b>	<b>6.6</b>
<b>Guatemala</b>	<b>24.7</b>	<b>2.1%</b>	<b>3.0%</b>	<b>\$2,013</b>	<b>12.3</b>
<b>Honduras</b>	<b>6.9</b>	<b>3.2%</b>	<b>3.7%</b>	<b>\$1,003</b>	<b>6.9</b>
<b>Nicaragua</b>	<b>2.6</b>	<b>2.3%</b>	<b>3.2%</b>	<b>\$473</b>	<b>5.5</b>
<b>Panama</b>	<b>12.9</b>	<b>4.1%</b>	<b>4.7%</b>	<b>\$4,136</b>	<b>3.1</b>
<b>Weighted Ave.</b>	<b>14.9</b>	<b>2.9%</b>	<b>3.2%</b>	<b>\$2,075</b>	<b>*38.7</b>

Source: Global Insight  
\*Total

	Energy Consumption								Carbon Dioxide Emissions (Million metric tons)
	Total (Quadrillion Btu)	Petroleum	Natural Gas	Coal	Nuclear	Hydro- electric	Other Electric*	Net Electric Imports	
<b>Belize</b>	<b>0.014</b>	<b>94%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>6%</b>	<b>0%</b>	<b>0%</b>	<b>0.9</b>

<b>Costa Rica</b>	<b>0.154</b>	<b>50%</b>	<b>0%</b>	<b>0.8%</b>	<b>0%</b>	<b>37%</b>	<b>13%</b>	<b>-0.9%</b>	<b>5.4</b>
<b>El Salvador</b>	<b>0.118</b>	<b>68%</b>	<b>0%</b>	<b>0.02%</b>	<b>0%</b>	<b>11%</b>	<b>20%</b>	<b>1.1%</b>	<b>5.6</b>
<b>Guatemala</b>	<b>0.170</b>	<b>81%</b>	<b>0%</b>	<b>3.0%</b>	<b>0%</b>	<b>12%</b>	<b>5%</b>	<b>-0.8%</b>	<b>10.1</b>
<b>Honduras</b>	<b>0.100</b>	<b>73%</b>	<b>0%</b>	<b>3.4%</b>	<b>0%</b>	<b>22%</b>	<b>0%</b>	<b>1.4%</b>	<b>5.6</b>
<b>Nicaragua</b>	<b>0.062</b>	<b>88%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>3%</b>	<b>9%</b>	<b>0.1%</b>	<b>3.9</b>
<b>Panama</b>	<b>0.206</b>	<b>87%</b>	<b>0%</b>	<b>0.8%</b>	<b>0%</b>	<b>12%</b>	<b>0.19%</b>	<b>-0.1%</b>	<b>13.6</b>
<b>Total/Ave.</b>	<b>0.824</b>	<b>75%</b>	<b>0%</b>	<b>1.4%</b>	<b>0%</b>	<b>17%</b>	<b>7.0%</b>	<b>0.03%</b>	<b>45.1</b>

\*Other electric includes geothermal, waste, and wood. Percentages may not add to 100% due to independent rounding.

Source: Energy Information Administration

	Fossil Fuel Proved Reserves			Fossil Fuel Production			Electric Generating Capacity, 1/1/02 (Gigawatts)	Crude Oil Refining Capacity, 1/1/04 Thousand barrels/day
				2003	2002			
	‡Crude Oil, 1/1/04 (Million barrels)	‡Natural Gas, 1/1/04 (Trillion cubic feet)	Coal (Billion short tons)	Petroleum* (Thousand barrels/day)	Natural Gas (Trillion cubic feet)	Coal (Million short tons)		
<b>Belize</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0</b>
<b>Costa Rica</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.7</b>	<b>‡25</b>
<b>El Salvador</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.1</b>	<b>‡22</b>
<b>Guatemala</b>	<b>526</b>	<b>0.11</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>1.9</b>	<b>0</b>
<b>Honduras</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.9</b>	<b>0</b>
<b>Nicaragua</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.6</b>	<b>‡20</b>
<b>Panama</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.3</b>	<b>0</b>
<b>Total</b>	<b>526</b>	<b>0.11</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>7.5</b>	<b>67</b>

\*Includes crude oil, natural gas plant liquids and other liquids.

Sources: Energy Information Administration except where indicated by a symbol : ‡Oil and Gas Journal, 1/01/0; and † company sources.

*Sources for this report include: AES Corporation; AP Worldstream; BBC Summary of World Broadcasts; Business News Americas; Business Wire; CIA World Factbook; Coal Week International; Comisión Ejecutiva Hidroeléctrica del Río Lempa (El Salvador); Dow Jones Newswires; Duke Energy International; Economist Intelligence Unit (EIU) Viewswire; EFE News Service; EIU ViewsWire; El Mundo; Empresa Nacional de Energía Eléctrica (Honduras); Empresa Nacional de Transmisión Eléctrica (Panama); Financial Times; Global Insight; Global Power Report; Grupo ICE (Costa Rica); Hart's Deepwater International; INDE (Guatemala); Independent Energy; International Market Insight Reports; Inter-America Development Bank; International Monetary Fund; Inter Press Service; International Water Power and Dam Construction; Janet Matthews Information Services (Quest Economic Database); Latin America Monitor; New York Times; Offshore; Oil and Gas Journal; Oil Daily; Ormat International; Petroleum Economist; Petroleum Intelligence Weekly; Petroterminal de Panama; Platt's Oilgram News; Power Engineering International; PR Newswire; Superintendencia General de Electricidad y Telecomunicaciones (El Salvador); Unidad de Transacciones (El Salvador); U.S. Energy Information Administration; Water Power and Dam Construction; World Oil.*

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