Energy in Ecuador

Opportunities in the Electric Sector

U.S. Commercial Service

Summary

The electricity sector in Ecuador requires significant improvements to increase power generation to cover the annual increase in demand of 5 to 6 percent, coupled with population growth of 2.5 percent. Electricity generation in Ecuador is heavily dependent on hydro sources, accounting for almost 45 percent of installed capacity. A drought in 2009 forced the Government of Ecuador (GoE) to diversify its supply options, increasing the participation of U.S. suppliers in the power generation industry. As the government further reviews its power generation strategy, good opportunities for U.S. companies to sell to the Ecuadorian power generation sector could be created.

Given Ecuador’s powerful rivers and propensity for hydroelectric power generation, the government has plans to develop several hydropower projects in the coming years and is actively seeking foreign direct investment to finance the implementation of these large projects. Once financing has been assured, there is the potential for further opportunities for U.S. suppliers.

Market Demand

Ecuador’s electricity market demand for energy and power grew steadily from 2004 to 2007, but the rate of increase has slowed in recent years. The slower growth rate in 2009 was due to a severe drought that heavily affected Ecuador in the last quarter and cost the country an estimated $1 billion in lost output. In response to this, the National Electricity Council (Consejo Nacional de Electricidad, CONELEC) has plans to construct 226 hydropower projects from 2012 to 2020, requiring an investment of approximately $10.9 billion. These projects have the potential to produce 11,818 MW, with demand currently at 3,768 MW. Of the 226 planned, the GoE is in different stages of building 15 hydropower plants that would produce 3,453 MW, an investment of approximately $5.52 billion.

The drought in 2009 caused production from hydroelectric plants along the Paute River to fall, leading to blackouts across Ecuador, and the country was forced to rely on more expensive thermo-generated energy produced by imported diesel.

To cover the country’s growing demand in the last decade, the GoE has been purchasing electricity from Colombia and Peru. Energy imports have recently reached the highest levels ever. This has been the impetus for the GoE to initiate a series of hydroelectric projects to cover market demand. In 2008, the GoE created an Energy Policy with an eye to improving efficiency and reducing bureaucracy. Large projects (defined as >50MW) will be developed by public enterprises, but the policy allows for greater private sector involvement and investment in medium scale projects (defined as 50MW). The policy sets forth various projects promoted by the government. As an example, the GoE plans to invest in the development of geothermal energy, and bio-diesel and bio-gas. The GoE is also seeking to expand natural gas exploration and to install more wind power turbines.

Energy demand has grown an average of five to six percent annually, to 14,000 gigawatt hours (GWh) per year in 2010, rising to a predicted 19,000 GWh per year by 2012.

The Ecuadorian Electric Corporation (Corporación Eléctrica Ecuador, CELEC EP) declared a state
of emergency in the electric sector to purchase needed electricity and called for a public contest for the installation and generation of 220 MW of thermoelectric generation. On March 24, 2011, CELEC EP awarded the contracts to: Hyundai-Equitatis (Korea/Ecuador), Asociación de Generación Ecuador (AGE), and Engevix Engenharia (Brazil).

**Market Data**

In 2007, the GoE created a new Ministry of Electricity and Renewable Energy to define sector specific policies to develop and strengthen the sector. A new electricity mandate issued in July 2008 established a single electricity rate for distributors and consolidated the 19 state distributors into one.

The electric sector is organized as follows with 16 main electricity generators, seven private, and nine state-run or affiliated. These are the key players:

- The Ministry of Electricity and Renewable Energy (Ministerio de Electricidad y Energías Renovables, MEER)
- The National Council of Electricity (Consejo Nacional de Electricidad, CONELEC) which develops the electric energy plan and regulates the sector. CONELEC establishes the regulations for generation companies, the transmission company, and distribution companies.
- The National Center for Energy Control (Centro Nacional de Control de Energía, CENACE) which operates and administers the system. CENACE establishes generation output by each agent, defines electricity imports, and settles payment among the sector on a monthly basis.
- Ecuadorian Electric Corporation (Corporación Eléctrica del Ecuador, CELEC EP) that includes the electric transmission company (Transelectric) and the main public generation companies.
- The National Electricity Corporation (Corporación Nacional de Electricidad, CNEL) was created in December 2008 to consolidate 10 distribution companies that had been reporting 40 percent losses for several years.
- Concessionaire companies for generating electricity
- Concessionaire companies distributing and commercializing electricity

The National Interconnected System (Sistema Nacional Interconectado, SNI) distributes electricity, which allows energy from hydroelectric and thermoelectric plants to be distributed nationwide. Power and energy are delivered in blocks to 19 electric companies. One of the main goals of the Energy Plan is to provide electricity to 99 percent of Ecuadorians. In rural areas, only about 86 percent of people have electricity. Quito, the capital located in the mountains, and Guayaquil, the principal port and manufacturing area, consume 25 and 36 percent, respectively, of total energy consumed.

As of December 2010, Ecuador had 206 power stations, 82 of which were incorporated into the SNI. Approximately 44.8 percent of power came from hydroelectric power, 50 percent from thermoelectric plants, and 11 percent from outside sources.

CELEC EP was created in January 2009 (originally as CELEC S.A.) to administer the major state generation companies: HidroPaute, HidroAgoyán, TermoEsmeraldas, TermoPichincha, ElectroGuayas, and HidroNación (Daule-Peripa) as business units. ElectroAustro is independent from CELEC, as well as HidroPastaza. CELEC currently generates 52 percent of the country’s demand.

Public sector projects aimed to increase capacity are:

- Construction of transmission lines, $400 million investment in three years.
- A 500 kV system to connect Guayaquil, Quito, Coca, and Sopladora dam located near Cuenca. It has received financing.
- Transmission system Santa Rosa-Pomasqui II, 230 kV
- El Inga substation 230/138 kV
• Transmission system Cuenca - Loja 138 kV.
• Transmission system Los Lojas - Nueva Salitral, 203 kV

In the private sector, Duke Energy, producing 180 MW, is the largest U.S. player in energy generation in Ecuador. Machala Power (Noble Energy) sold its assets to the GoE and left the country in May 2011.
The projects mentioned above open interesting opportunities for U.S. vendors in the sector.

**Best Prospects**
The GoE is developing and modernizing the thermoelectric sector. Many power plants require urgent upgrades and most of them consume diesele, which must be imported. Efforts are focused on reducing energy costs and promoting international investment for the construction of new projects to avoid energy imports. Attracting sufficient outside investment may prove difficult because of legal disputes between the state and foreign businesses invested in the energy sector.

With respect to electricity generation equipment, Ecuador has been looking for technology to develop the sector and must import equipment and supplies from various countries. The sector presents good U.S. export opportunities in the generation and transmission stages of the system.
The National Master Plan for Electricity has a thorough description of the sector, strategies, and projects that will require local and foreign vendors, included in this overview.

Demand for U.S. imports is mainly required in the generation process, since it depends on technology, products, and services from overseas. Most of the imports are made by substations which need control panels, boards, cables, generators, electric motors, and other auxiliary products and services. Civil construction is mainly done with local vendors for tunnels, channels, and other required works. Construction equipment for tunnels and towers is imported by local construction companies.

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