Best Export Markets
for
U.S. Electric Power Systems and Services, 2008

Best Export Markets for U.S Electric Power Systems and Services was compiled by Tanvi Kweera, under the supervision of Maurice Kogon, Director of the El Camino College Center for International Trade Development (CITD) in Hawthorne, California. The report is based largely on 2008 Country Commercial Guides (CCGs) prepared by United States Commercial Service (USCS) posts abroad. All CCGs include a standard chapter "Leading Sectors for U.S. Exports." This report drew from those CCGs which specifically recommended Electric Power Systems and Services as a best prospect for U.S. exports.

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Best Export Markets
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U.S. Electric Power Systems and Services, 2008

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Argentina	**Finland**	**Libya**	**Spain**
Belgium	**Georgia**	**Lithuania**	**Sri Lanka**
Bulgaria	**Ghana**	**Macedonia**	**Sweden**
Canada	**Greece**	**Mexico**	**Switzerland**
China	**Guatemala**	**New Zealand**	**Thailand**
Czech Republic	**Honduras**	**Panama**	**Turkey**
Columbia	**Hungary**	**Philippines**	**Ukraine**
Denmark	**India**	**Portugal**	**Venezuela**
Dominican Rep.	**Indonesia**	**Romania**	**Vietnam**
Ecuador	**Ireland**	**Saudi Arabia**	
Ethiopia	**Israel**	**Senegal**	
Fiji	**Kenya**	**Slovenia**	

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I. Export Market Overview

HS 8502: Electric Generating Sets and Rotary Converters

This Market Brief provides an overview of the world market for products falling within one category of Electric Power Systems and Services (Electric Generating Sets and Rotary Converters - HS 8502), based on an analysis of the latest trade statistics and market research.

Export Growth: U.S. exports of HS 8502 products rose from $1.363 billion in 2004 to $2.533 billion in 2007, an increase of 85.9% over the four-year period.

Leading Export Markets: Canada is by far the leading market for U.S. exports of HS 8502 products ($350.9 million in 2007, 13.9% of total). Other top markets (valued above $80 million) were China (8.8%), Russia (8.3%), Singapore (6.9%), Belgium (5.2%), Kuwait (5.1%),.United Kingdom (3.8%), Pakistan (3.5), and Norway (3.2%)

Fastest Growing Export Markets: The leading markets with both high and sustained growth rates for US exports of HS 8502 products over the 2004-07 period and continuing in 2006-07 were: United Kingdom, Russia, China, Kuwait, Singapore, Belgium, and Norway. Other significant growth markets over the 2004-07 period were Australia, Germany, Spain, and Italy.

Leading Importing Countries: The world's top foreign importers of HS 8502 products in 2007 (all above $600 million) were China (9.1%), Russia (6.9%), Germany (6.5%),Thailand (4.8%) and Canada (4.4%). Other significant importers (all above $300 million) were Spain (3.4%), Australia (3.3%), Korea (3.3%), United Kingdom (3.2%), France (2.9%),Saudi Arabia (2.7%), Netherlands (2.2%), and Singapore (2.2%).

World Market Size & U.S. Share: Total world exports of HS 8502 products by all countries reached $17.3 billion in 2007. The U.S. topped all other suppliers in 2007 with a 14.6% share of the total world market. Other world suppliers with significant market shares were United Kingdom (11.1%), Denmark (10.8%), China (10.8%), Germany (10.6%), and Japan (7.3%).

Best Market prospects: The markets listed below appear to be particularly promising for U.S. exports of Electric Power System and Services over the next two years, based on recommendations of in-country USCS industry specialists. Specific US export statistics on products in this category are available from the CITD for all countries, including those listed below (Source: U.S. Census Bureau). The CITD also has access to relevant trade contacts, trade opportunities and market research on each country:

Argentina	Finland	Libya	Spain
Belgium	Georgia	Lithuania	Sri Lanka
Bulgaria	Ghana	Macedonia	Sweden
Canada	Greece	Mexico	Switzerland
China	Guatemala	New Zealand	Thailand
Czech Republic	Honduras	Panama	Turkey
Columbia	Hungary	Philippines	Ukraine
Denmark	India	Portugal	Venezuela
Dominican Rep	Indonesia	Romania	Vietnam
Ecuador	Ireland	Saudi Arabia	
Ethiopia	Israel	Senegal	
Fiji	Kenya	Slovenia	

II. Market Potential Indicators

A. Top 30 U.S. Export Markets, 2004-07. This table shows the leading and fastest growing export markets for U.S. products within one category of Electric Power Systems and Services (Electric Generating Sets and Rotary Converters -- HS 8502), over the past several years. Source: US Census Bureau.

B. Top 30 World Importers, 2007, by Country. This table shows the leading and fastest growing world importers of products within one category of Electric Power Systems and Services (Electric Generating Sets and Rotary Converters -- HS 8502), in 2007. Source: United Nation COMTRADE.

C. Top 30 World Exporters& U.S. Market Share, 2007: This table shows the U.S. and competitor-country shares of total world exports of products within one category of Electric Power Systems and Services (Electric Generating Sets and Rotary Converters -- HS 8502), in 2007. Source: United Nations COMTRADE.

D. Market Sizes & U.S. Share of Imports, 2005-2007, by Country. This table shows each "best prospect" country's total market, total imports, and imports from the U.S. and the U.S market share for Electric Power Systems & Services. Source: U.S. Commercial Staff in each country.

II. Market Potential Indicators

II.A. Top 30 U.S. Export Markets, 2004-2007, By Country

HS 8502: Electric Generating Sets and Rotary Converters

Country	2004	2005	2006	2007	% Change 2004-07	% Change 2006-07	% Share 2007
	In 1,000 Dollars						
Canada	226,288	252,086	469,631	350,913	55.1%	-25.3%	13.9%
China	75,101	112,009	117,595	222,086	195.7%	88.9%	8.8%
Russia	1,933	27,698	27,435	210,564	10793.1%	667.5%	8.3%
Singapore	38,538	64,187	115,438	173,762	350.9%	50.5%	6.9%
Belgium	37,844	39,261	98,769	130,659	245.3%	32.3%	5.2%
Kuwait	1,965	11,735	15,971	128,996	6464.7%	707.7%	5.1%
United Kingdom	37,310	82,205	116,491	97,198	160.5%	-16.6%	3.8%
Pakistan	21,286	48,060	124,459	88,675	316.6%	-28.8%	3.5%
Norway	1,717	3,719	1,456	80,055	4562.5%	5398.3%	3.2%
Australia	33,793	20,838	34,603	68,400	102.4%	97.7%	2.7%
Mexico	34,033	106,736	176,177	68,334	100.8%	-61.2%	2.7%
Germany	11,303	25,845	36,045	59,010	422.1%	63.7%	2.3%
Italy	30,973	16,292	25,366	54,030	74.4%	113.0%	2.1%
Saudi Arabia	20,235	46,579	40,346	51,641	155.2%	28.0%	2.0%
Spain	14,348	36,118	5,766	42,432	195.7%	635.9%	1.7%
United Arab Em	18,377	30,480	52,265	41,446	125.5%	-20.7%	1.6%
Korea	54,257	51,347	27,793	41,294	-23.9%	48.6%	1.6%
Malaysia	29,444	10,059	24,579	38,422	30.5%	56.3%	1.5%
Chile	16,858	17,755	18,480	34,610	105.3%	87.3%	1.4%
Bangladesh	29,804	24,921	35,380	29,587	-0.7%	-16.4%	1.2%
Egypt	17,350	14,344	13,164	28,657	65.2%	117.7%	1.1%
Thailand	28,444	3,596	8,488	24,476	-14.0%	188.4%	1.0%
Argentina	21,966	16,259	18,752	23,564	7.3%	25.7%	0.9%
Uruguay	68	164	129	22,695	33275.0%	17493.0%	0.9%
Switzerland	680	61	6,546	22,318	3182.1%	240.9%	0.9%
Brazil	5,859	23,742	16,231	20,641	252.3%	27.2%	0.8%
Peru	3,524	7,222	17,592	19,718	459.5%	12.1%	0.8%
Martinique	0	30	0	19,612	NA	NA	0.8%
Dominican Rep	19,276	15,124	15,977	18,786	-2.5%	17.6%	0.7%
Qatar	145	7,630	7,533	18,773	12846.9%	149.2%	0.7%
Subtotal :	**832,719**	**1,116,103**	**1,668,459**	**2,231,353**	**168.0%**	**33.7%**	**88.1%**
All Other:	**530,347**	**388,762**	**325,064**	**302,112**	**-43.0%**	**-7.1%**	**11.9%**
Total	**1,363,065**	**1,504,865**	**1,993,523**	**2,533,465**	**85.9%**	**27.1%**	**100.0%**

II. Market Potential Indicators

II. B Top 30 World Importers, 2007

HS 8502: Electric Generating Sets and Rotary Converters

Importing Country	2007	% Share
USA	$3,267,020,732	23.38%
China	$1,268,413,891	9.08%
Russian Federation	$964,280,330	6.90%
Germany	$911,283,000	6.52%
Thailand	$666,314,809	4.77%
Canada	$618,053,877	4.42%
Spain	$476,266,085	3.41%
Australia	$462,935,536	3.31%
Rep. of Korea	$459,577,675	3.29%
United Kingdom	$451,458,689	3.23%
France	$407,992,726	2.92%
Saudi Arabia	$370,553,309	2.65%
Netherlands	$308,998,796	2.21%
Singapore	$303,256,531	2.17%
Italy	$299,056,753	2.14%
Belgium	$278,724,453	1.99%
Argentina	$180,207,256	1.29%
Portugal	$176,396,634	1.26%
Turkey	$159,906,309	1.14%
China, Hong Kong SAR	$152,682,103	1.09%
Norway	$143,916,597	1.03%
Japan	$136,505,044	0.98%
Greece	$107,138,032	0.77%
Brazil	$96,283,803	0.69%
Denmark	$86,388,740	0.62%
Poland	$82,759,485	0.59%
South Africa	$81,745,678	0.59%
Romania	$81,056,381	0.58%
Austria	$79,842,366	0.57%
Sweden	$74,761,011	0.54%
Top 30 Subtotal	**$13,153,776,631**	**94.14%**
Other	**$818,295,184**	**5.86%**
World Total	**$13,972,071,815**	**100.00%**

II. Market Potential Indicators

II. C. Top 30 World Exporters & U.S. Market Share, 2007

HS 8502: Electric Generating Sets and Rotary Converters

Exporting Country	2007	% Share
USA	$2,533,465,058	14.61%
United Kingdom	$1,925,429,432	11.11%
Denmark	$1,877,779,409	10.83%
China	$1,869,322,872	10.78%
Germany	$1,840,059,000	10.61%
Japan	$1,266,603,737	7.31%
France	$815,776,422	4.71%
Singapore	$585,694,787	3.38%
Spain	$577,736,507	3.33%
Italy	$542,667,520	3.13%
Thailand	$411,385,568	2.37%
Finland	$395,782,163	2.28%
Austria	$333,836,715	1.93%
Switzerland	$303,361,244	1.75%
Netherlands	$289,780,026	1.67%
Sweden	$241,905,917	1.40%
Rep. of Korea	$208,202,021	1.20%
Belgium	$190,936,516	1.10%
Canada	$159,506,078	0.92%
China, Hong Kong SAR	$140,877,412	0.81%
Czech Rep.	$122,690,221	0.71%
Turkey	$112,425,789	0.65%
Brazil	$94,214,889	0.54%
Norway	$87,073,148	0.50%
Australia	$57,586,947	0.33%
Portugal	$55,762,528	0.32%
Russian Federation	$54,113,060	0.31%
Poland	$43,397,949	0.25%
Saudi Arabia	$40,100,986	0.23%
South Africa	$26,649,828	0.15%
Top 30 Subtotal	**$17,204,123,749**	**99.24%**
Other	**$131,079,371**	**0.76%**
World Total	**$17,335,203,120**	**100.00%**

II. Market Potential Indicators

II .D. Market Sizes & U.S. Share by Country

The table below provides comparative data on total market, import market, and import from the U.S. for 12 countries considered the "best prospects" for U.S. exports of Electric Power System and Services. The countries are listed in alphabetical order, not in rank order .The data are based on local sources and reflect best estimates of USCS commercial officers in each country. Statistical accuracy and comparability to other sources (e.g., "USDOC Bureau of census") are affected by a number of factors, including lack of published figures in certain markets, variances in data collection techniques, sources of data and industry definition.

Electric Power Systems and Services

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Value in $ millions

	Total Market			Total Imports			Imports from US			% US Share
Country	2005	2007	% Change	2005	2007	% Change	2005	2007	% Change	2007
	In Million Dollars				In Million Dollars			In Million Dollars		
Argentina	1,610	2,554	58.6%	648	1340	106.8%	133	240	80.5%	17.9%
China	18,750	24,093	28.5%	4,633	7,192	55.2%	234	287	22.6%	4.0%
Colombia	448.3	527.3	17.6%	462.4	687.3	48.6%	217.9	237.6	9.0%	34.6%
Czech Republic	2500	2950	18.0%	650	900	38.5%	150	200	33.3%	22.2%
Ghana	250	144	-42.4%	N/A	144	N/A	10.6	30	183.0%	20.8%
Greece	1455	1900	30.6%	1,100	1,400	27.3%	70	180	157.1%	12.9%
Honduras	180	200	11.1%	180	200	11.1%	125	135	8.0%	67.5%
Lithuania	1145	1169	2.1%	1,783	2,120	18.9%	N/A	N/A	N/A	N/A
Mexico	10,063.20	11,284.90	12.1%	17,511.20	19,697.60	12.5%	12,082.70	13,714.40	13.5%	69.6%
New Zeland	1120	1320	17.9%	1,100	1,300	18.2%	600	750	25.0%	57.7%
Spain	4,589	6,473	41.1%	1,763	2,409	36.6%	821	927	12.9%	38.5%
Sweden	4.25	4.91	15.5%	2.05	2.5	22.0%	200	410	105.0%	16400.0%

III. Best-Prospect Market Assessments

Following are overviews of "best prospect" markets for Electric Power Systems and Services, based on observations of USCS posts in each country. The countries appear in alphabetical order. For more detailed market research on Electric Power Systems and Services in these and other specific markets, see relevant Market Research Reports listed in Chapter V. For general commercial and economic information on individual countries, see the relevant Country Commercial Guides (CCGs).

ARGENTINA

The electric power sector in Argentina was particularly affected by the economic crisis of 2001/2002. Rates had been virtually frozen in 1998, when the government suspended adjustments based on the U.S. PPI, and no alternate adjustment formula was offered. The private operators of public utilities found themselves collecting devalued pesos, and paying for equipment and supplies and serving their debt in hard currency. This situation seriously affected the private operators' ability to keep up with maintenance and expansion programs. Continued pressure from the GOA will force the power companies to partially resume their investment, in order to keep their assets in working condition. However, the lack of investment in new assets in the past six years may result in a temporary inability of the system to accommodate growing demand, especially during peak use periods. Two combined cycle plants to be financed by several of the generating companies will be built by Siemens, with start-up date in mid/late 2009. A coal-fired power plant is to be built at the site of a coalmine in Rio Turbio, Santa Cruz. Transener, operator of the principal 500 KvA lines, is investing in some expansions to the National Grid, but has gone on record saying that substantial additional investment will be needed, both in the grid and in generation. Renewable energy sources are being mentioned with growing emphasis as a partial solution to growing demand and stagnant supply. Wind power seems particularly promising given the current potential in several regions although Spanish, Danish, and German suppliers have to date taken the lead in the supply of equipment to a very small wind generation market.

Best Products/Services
Specific types of equipment showing the best potential are generators and generator sets, including used and refurbished units, transformers, turnkey combined cycle plants, gas-turbines, steam turbines, transmission line telecontrols, electronic frequency converters, reclosers, and switchgears, as well as the aforementioned wind power equipment.

Opportunities
There are opportunities in various upcoming projects, such as the expansions to the power transmission grid mentioned in the overview, as well as several smaller thermal projects in Cordoba, Chubut, Neuquén and various other provinces. There is demand for boilers, turbo-generators and generator sets, particularly refurbished units. Renewable energy also offers opportunities, particularly for suppliers of wind generators.

Resources
- Electric Power Sector Specialist at the U.S. Embassy in Argentina: Alvaro.Mendez@mail.doc.gov
- Ministry of Planning, Public Investment, and Services (the Secretariat of Energy is subordinate to this Ministry): www.minplan.gov.ar
- Federal Council on Electric Power: *(Consejo Federal de la Energía Eléctrica)*: a consulting body under the Secretariat of Energy, with representatives of all the
- Provinces: www.cfee.gov.ar - cfee@cfee.gov.ar

- Association of Power Generators *(Asociación de Generadores de Energía Eléctrica de la República Argentina):* www.ageera.com.ar - secretaria@ageera.com.ar
- Association of Power Distributors *(Asociación de Distribuidores de Energía Eléctrica de la República Argentina):* www.adeera.com.ar - adeera@adeera.com.ar
- Association of Power Transportation Companies *(Asociación de Transportadores de Energía Eléctrica de la República Argentina):* www.ateera.com.ar

For additional information on this industry such as trade events, useful links, and the products and services that the U.S. Commercial Service can provide to help you succeed in the Argentine marketvisitwww.comerciousa.org/argentina_editable/-amendez/energy_electric_power/energy_electric_power_main.asp.

BELGIUM

Overview
Currently, several shifting factors influence the rapidly changing Belgian energy market. These include: the continuing process of de-regulation and liberalization, the discussion on the phasing or non-phasing out of nuclear energy (with consequences for the structure of electricity production and a possible impact on renewable energy methods), the changing structure of the country's energy distribution, the new Belgian power exchange, cross-border trade and several company mergers. U.S. companies wanting to export to the Belgian energy market obviously have to be aware of, and take into account, these uncertain or changing factors, which determine purchasing policy in Belgium.

Best Products/Services
. Companies that provide support services and equipment to the power generation market. Companies active in the fields of renewable and sustainable energy and energy efficiency technologies/equipment. Also, U.S. service companies who stimulate efficient use of energy through training energy audits or analytical accounting will be in demand. In this context, the Regulation Committee for Gas and Electricity (CREG) submitted a proposal for an indicative power generation program in 2004-2014, stating that the capacities to be invested in the period 2005-2014 amounts to 1,729 MW in renewable energy sources, and 1,749 MW in qualitative co-generation. In this same proposal, by 2014, decisions are recommended on investments in eight units using combined steam and gas cycles (CCGT plants) of 400 MW and four gas turbines with open cycles (GT) of 80 MW. The first GT units are expected to come into operation in 2008 and the first CCGT unit in 2009, so decisions on this should be made over the next three years.
. Companies active in the conversion of existing electricity generation plants and the construction of CCGT units, Companies active in energy trading, electricity and gas, Companies active in nuclear energy. Nuclear energy still accounts for more than 50% of Belgium's electricity production. However, the former "green" government planned to phase out nuclear energy between 2015 and 2025, but due to the high dependence on nuclear energy, experts found this to be an unrealistic goal. A commission of experts concluded that phasing out nuclear energy should be compensated by the construction of gas plants, the exploitation of wind energy, biomass and cogeneration and a reduction in electricity consumption, or higher efficiency of electricity production. Each region actively promotes these new technologies through various financial incentives. The level of subsidies varies according to the type of enterprise and the introduction of new energy efficiency policies, particularly environmental.

Opportunities
The Belgian law addressing EU energy directives on electricity and gas was passed in April 1999. The implementation date for the first stage of electricity deregulation was February 19, 2000, with gas deregulation beginning on August 10, 2000. In general terms, this deadline was

achieved. Indeed, the liberalization process was accelerated as a result of EU directives in this area, corporate sector decisions (some large Belgian-based electricity customers switched to other electricity providers) and regional authorities. The years 2002, 2003 and 2004 were characterized by the further liberalization of the electricity and gas markets. Each of the three regions has also set up their respective regulatory commission: VREG in Flanders, CWAPE in Wallonia and IbgeBim in Brussels. In addition to supervising the operation of the electricity market, they also play a central role in issuing supply licenses, authorizing cogeneration facilities and facilities generating renewable power, and issuing and managing green power certificates. Further information and many legal texts are available on the following websites:

- Federal government http://mineco.fgov.be/
- Regulator of the Flemish region http://www.vreg.be/en/index.asp
- Regulator of the Walloon region http://www.cwape.be
- Regulator of the Brussels region http://www.ibgebim.be/

Resources

- CREG - Regulation Committee for Gas and Electricity Rue de l'Industrie, 26-38 B-1040 – Brussels Tel: +32 2/289.76.11 Fax: +32 2/289.76.09
  Web Site: http://www.creg.be
  E-mail: info@creg.be
- Wallonia Energy Commission –Avenue Gouverneur Bovesse 103-106 B-5100 Jambes (Namur) Tel: +32 81/33.08.10 Fax: +32 81/33.08.11
  E-mail: cwape@cwape.be
  Web Site: http://www.cwape.be
- FEBEG – the Belgian federation for electricity and gas companies Ravensteingalerij 3 bus 9 1000 Brussels Tel.: +32 2 500.85.85 Fax: +32 2 500.85.86; Email: info@febeg.be
- Figaz, the Belgian Gas federation, Inter-Regies Rue Royale, 55 box10 B-1000 – Brussels Tel: +32 2/217.81.17 Fax: +32 2/219.20.56; Web Site: http://www.inter-regies.be
  E-Mail: ir@inter-regies.be Contact: Gert De Block, General Secretary
- APERe (Association pour la Promotion des Energies Renouvelables) 7, rue de la Révolution B- 1000 Brussels Tel: +32 2/218 78 99 Fax: +32 2/219 21 51
  Web Site: http://www.apere.org; E-mail: info@apere.org Contact: Mr. Huart, Managing Director
- Cogen Europe - The European Association for the Promotion of Cogeneration Rue Gulledelle, 98 B-1200 – Brussels Tel: +32 2/772.82.90 Fax: +32 2/772.50.44
  Web Site: http://www.cogen.org
  E-Mail: info@cogen.org Contact: Simon Minett, Director Brussels Office
- FEBELIEC – Federation of the Belgian Large Industrial Energy Consumers Square Marie-Louise, 49 B-1000 – Brussels Tel: +32 2/238.97.11 Fax: +32 2/231.13.01
  E-Mail: febeliec@fedichem.be Contact: Luc BRAET, President.

BULGARIA

Bulgaria's EU membership means increased energy demand, decreased supply (the closure of Kozloduy's reactors 3 and 4), requirements for rehabilitation of the obsolete generation units, development of new thermal and nuclear power generating capacities, development of alternative energy supply and increased energy efficiency. Major rehabilitation and the development of alternative energy sources create abounding opportunities for US companies in Bulgaria. Firms providing solutions for increase of the Bulgarian energy independence and energy efficiency will find also good opportunities for its equipment and services.

Best Products/Services
The best products for U.S. companies are exports of electrical power systems and activities related to construction of new power capacities; energy network design and construction; co-generation and district heating equipment and technologies; upgrading and maintenance of street lighting; upgrading of boilers and electro precipitators (solid emission) and supply of Flu Gas desulphurization installations for the thermal energy sector.

Opportunities
The coal mining sector and its rehabilitation also provide opportunities for American companies specialized in mining equipment and technologies as well as improvement of the lignite mines' energy efficiency.

Resources
- Bulgargaz EAD www.bulgargaz.bg
- National Electric Company www.nek.bg
- Sofia District Heating Company www.toplo.bg
- Kozloduy NPP www.kznpp.org
- Ministry of Economy and Energy www.mi.government.bg/
- State Energy and Water Regulatory Commission www.dker.bg
- Energy Efficiency Agency www.SEEA.government.bg

For more information on market entry strategies contact:
Emily Taneva, Commercial Specialist
U.S. Commercial Service, Sofia, Bulgaria
Tel: 359-2-939-5770
Email: emily.taneva@mail.doc.gov
http://www.buyusa.gov/bulgaria

For information on alternative/renewable energy and energy efficiency contact:
Andon Kalibatsev
U.S. Commercial Service, Sofia, Bulgaria
Tel: 359-2-939-5781
Email: andon.kalibatsev@mail.doc.gov
http://www.buyusa.gov/bulgaria

CANADA

Fuelled by an expanding economy, a growing population and increased energy demands, the Canadian Electrical Power Systems market is also forecasted to expand across the board through 2030. Between 1990 and 2007, electricity demand in Canada increased by 24%, and this trend is expected to continue with an average annual growth rate between 1 and 1.5%. In 2007, the market value of electrical power systems was $15.1 billion. Imports were valued at $10.8 billion of which 63% or $6.8 billion was from the United States. Given the increased demand and the ageing systems in place, a growth rate of between 6-8% is expected over the next two years. This will equate to an expected market value of $16.2 billion, with imports valued at $11.5 billion, 65% or $7.5 billion of which would come from the U.S.

According to the International Energy Agency, Canada will require an investment of approximately $185 billion in electricity infrastructure between 2007 and 2030; i.e. generation $95 billion; transmission $27 billion; and distribution $63 billion. New and replacement capacities between 18,000-23,000 MW will be required by 2010. Total infrastructure requirements across North America are expected to reach $4.1 trillion over the same timeframe.

The inevitable competition for capital will require Canada to establish favorable conditions for investment. With electricity demand slated to increase annually, it is prudent to understand where these increases will manifest themselves most readily in order to maximize opportunity. In Ontario, approximately 20% of current capacity which is now derived from coal and the roughly 40% of total supply presently derived from nuclear plants will need to be replaced. By 2025, the Ontario Power Authority (OPA) expects generation capacity will have to increase by about 15%, meaning the province will need to rebuild, refurbish, or replace up to 80% (25,000 MW or $40 billion) of its power supply. This substantial restructuring of Ontario's energy sector presents a wealth of opportunities for U.S. companies involved in the manufacturing or distribution of electrical power systems and related components.

Alberta is another province expecting rapid growth in this sector. The Alberta Electric Systems Operator (AESO) expects Alberta's demand for power to grow by 3.5 to 4.3% through the foreseeable future. If predictions hold, this would require an additional 3,800 MW of new generation capacity by 2016. In its 10-year Transmission Plan, the AESO projects $3.5 billion in proposed transmission development will be needed by 2016 to ensure reliable electricity supply. This is in addition to roughly $1.2 billion in transmission developments already approved and underway in the province. In British Columbia, BC Hydro has instituted the BC Energy Plan to fulfill an expected 45% growth in electricity consumption over the next 20 years. Similarly, SaskPower expects Saskatchewan to face a power gap of over 1500 MW by 2025. Also, "Green technologies" are an emerging industry sector throughout Canada as renewable energy initiatives are being implemented in all provinces. The Ontario government alone has set the goal of doubling renewable energy supply to 15,700 MW by 2025.

Best Products/Services
At present, the electrical power systems market in Canada consists primarily of power boilers, heat exchangers, turbine and mechanical power transmission equipment, electric transformers, electric switchgear and switchboards, relay and industrial control apparatus, electric static converters, protective equipment, and energy wire and cables. In addition, the increased use of co-generation and gas turbines has raised the demand for turbines, boilers, and transformers. Renewable technologies – There are wind and solar energy projects throughout Canada and the government is encouraging more investment in these technologies.

Opportunities
- *Alberta*: Alberta's 10 and 20-year transmission system plans have several opportunities as well as wind power technologies.
- *British Columbia*: BC Energy Plan
- *Manitoba*: Conawapa Generating Station, Downtown Office Project, Notigi Generating Station, Wind-Powered Generation
- *Ontario*: Renewable technologies – wind, solar. National East-West Power Grid. Clean Energy Transfer Initiative (CETI), Quebec-Ontario Transmission Interconnection Project, Portlands Energy Centre, Niagara Reinforcement project, Goreway Station project and the Halton Hills project.

Resources
- Alberta Electric Systems Operator (AESO)
- BC Ministry of Energy, Mines and Petroleum Resources).
- Canadian Electricity Association
- Manitoba Hydro
- Ontario Ministry of Energy
- Association of Power Producers of Ontario (APPrO)

CHINA

In 2007, the installed capacity in China reached 622 million kW, and the amount of power generated was 2,870 billion kWh, making China's the world's second-largest power generator and the fastest-growing power generation market. According to the International Energy Agency, China will invest a total of nearly $2 trillion in electricity generation, transmission, and distribution over the next 30 years to meet rapidly growing electricity demand. Half of that investment will be in power generation, while the other half will go to transmission and distribution.

Thermal energy accounts for 77.82% of China's capacity, while hydropower provides 20.67% and nuclear power less than 1.6% of total capacity. With the limited supply of fossil fuels available for power generation, the Chinese government is encouraging alternative forms of power supply, such as hydropower, wind power, solar power, etc. China has unveiled an energy plan as part of its 11th five-year plan. Under the plan, China aims to increase the country's renewable energy supply to 15% of the country's energy needs by 2020.

Best Products/Services

The most competitive products and services for U.S. companies will be in advanced thermal power generation (including large-capacity gas turbines, super critical and ultra super critical large capacity coal-fired power generation equipment, clean coal technology, and combine cycle technology), alternative power supplies (including wind, solar, and nuclear), power dispatching systems, telecommunications equipment for the power industry, management software, and ultra high voltage transmission equipment and management systems. Safety equipment also has strong market potential for U.S. companies.

Opportunities

By 2020, China plans to build 30 nuclear generators of one million kW and above, bringing the country's total nuclear capacity to 40 GW. In December 2006, U.S. technology was selected for 4 new reactors planned to be built in Zhejiang and Shandong provinces in 2007 and 2008. There is also strong demand for the following products

- 900 MW and above thermal power generating equipment, gas turbines
- 700 MW and above hydro power turbines, large-capacity pump storage units, advanced nuclear power station equipment, clean-coal technology power generating equipment
- 300 MW and above cogeneration and tri generation units
- 600 MW and above air cooling power generation units
- Combine cycle units
- 300 MW and above circulating fluidized-bed boilers and Integrated Gasification Combined Cycle (IGCC) units
- 750 kV and above transmission line equipment
- 1.3 MW capacity and above wind turbines, thermal power plant flue gas desulphurization equipment, power industry automation equipment, power grid safety supervision and control software and equipment, and middle and high voltage capacitors.

Resources

- China Electric Equipment and Instrument Net http://www.cpeinet.com.cn/
- State Electric Regulatory Commission http://www.serc.gov.cn/
- Chinese Renewable Energy Industries Association http://www.creia.net
- Guangzhou Institute of Energy Conversion http://www.giec.ac.cn/
- Zhuhai New Energy Research Institute http://www.china-new-energy.com/
- China New Energy Information Net http://www.newenergy.org.cn/
- China Sustainable Energy Program http://www.efchina.org/

- China Solar Energy Information Net http://www.chinasolar.com.cn/
- China Bio-gas Information Net http://www.china-biogas.cn/
- Guangzhou Institute of Energy Conversion http://www.giec.ac.cn/

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CZECH REPUBLIC

The general electricity generation system will rely on the exhaustion of the remaining reserves of brown coal, and on nuclear energy. The potential of hydro energy is already being utilized at a high rate. Renewable energy sources currently supply 4.8% of the Czech Republic's primary needs. This share should be raised to 8% by 2010; biomass is considered the most important source of renewable energy while wind, solar and hydro sources are limited due to the country's natural conditions.

As of now, the installed output in the country is 17,434 MW. In 2006, the country produced 86.331 TWh, of which 24.78 TWh of electrical power was exported, mainly to Germany, Austria and Slovakia. CEZ also owns and operates nuclear power capacity of 3.8 GW, which accounts for 31.1% of its total capacity. Temelin is the largest at 2,000 MW. (Westinghouse is the fuel supplier for Temelin until 2010, when Russian firm Tvel will begin supplying fuel. The company was selected in a public tender.) Skoda Praha, a 100% CEZ-owned subsidiary, received a $123 million contract from CEZ to increase the output of the Dukovany nuclear plant. CEZ states that it is ready to invest in additional Czech nuclear power generation capacity as soon as the political approval is given. In 2008, CEZ Distribution (a part of the CEZ Group) investments into the distribution grid, including repairs, will total $500 million. This represents an increase of roughly $57 million on last year. This year CEZ Distribution will also invest into the improvement of its high-voltage networks in districts along the Czech-Polish border.

Best Products/Services

- Equipment for the retrofit of coal plants, including boilers and pumps
- Control systems and SW services for power distribution networks
- Software services
- Clean-coal technologies
- Renewable energy equipment (mainly for waste-to-energy projects and partly for wind power units)

Opportunities

Opportunities in the Czech energy sector in the upcoming year will originate from projects introduced by the dominant Czech power generator – the Czech Energy Works (CEZ) in November 2005. CEZ owns coal-fired power plants accounting for 56% of energy generation that will reach the end of their expected working life within four years. Retrofit, modernization and construction of several power plants controlled by CEZ represent promising export potential for U.S. companies. CEZ will publish tenders at www.cez.cz and www.centralniadresa.cz
2008 – 2011 Ledvice; construction of 1 x 656MW new bloc
2010 – 2013 Prunerov; complete retrofit of 5 x 200 MW blocs
2010 – 2015 Pocerady; construction of 1 x 660 MW new bloc

These power plants all burn local brown coal and are located in the North Bohemian mining region.

Resources:

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COLOMBIA

The current Colombian electric power market is a direct result of the provisions set forth in various laws and decrees enacted since 1994. Public utilities (55%) and private generators (45%) are developing plans for additional projects to accommodate the increasing power demand (since 2000) due to growing consumption from industries, domestic consumers, and increased exports to Ecuador. They are investing more in thermal and wind power generation than in hydro power plants, to reduce the uncertainty of power availability related to potential droughts. The government plans to develop a regulatory framework to expand the use of energy efficient systems and create awareness for the rational use of energy, including building more cogeneration facilities. At the end of 2006, Colombia's net installed electric power capacity of the National Interconnected System (SIN) reached 13,277 MW. This represented 64.1% hydro-powered with the remainder thermal-powered (natural gas - 26.8%, and coal – 5.3%), wind power and cogeneration facilities (3.8%). Projected demand for 2015 could reach 72,000 GWh/h.

Industry sources estimate that new power plants need to be on-line by 2013, which will require an estimated $5 billion US from private sponsors. However, there are concerns about the availability of natural gas for power generation. The Minister of Mines and Energy's suggestions for the use of diesel or coal, present environmental concerns as does the use of diesel, which continues to receive governmental subsidies and is mostly imported. Both of these fuels may not be good alternatives. The government needs to clarify these issues before investors make decisions on power projects.

The Energy and Gas Regulatory Commission (CREG) enacted a "Reliability Charge" that recognizes the availability of generation assets to insure "firm generation capacity" under critical conditions. This is a major incentive to develop new power projects in Colombia. Several large utilities and transmission companies, including Interconexión Eléctrica (ISA), Empresas Públicas de Medellín (EPM), ISAGEN S.A.E.S.P, and Empresa de Energía de Bogotá (EEB) are evaluating expansion projects to other Andean (Bolivia, Ecuador, and Perú) and Central American countries, especially the power interconnection with Panama, which could lead to other projects in Central America. The Uribe Administration is also promoting the use of renewable energy sources, especially for off-grid, isolated areas. Efforts are underway to promote private ventures in the areas of solar, wind, and small-hydro systems. If successful, this would allow the use of energy in sustainable community projects. EPM owns the country's only wind power plant (Jepírachi), a 19.5 MW facility, with financial support from the World Bank's Prototype Carbon Fund's greenhouse gas reduction credits. Other electric utilities are interested in pursuing renewable energy projects (mainly wind). Another non-traditional project is the Amoyá run-of-river hydro project that is expected to produce some 80 MW of electricity and additional environmental benefits aimed at protecting the surrounding paramo areas. Tariffs on 65% of U.S. energy equipment exports will be eliminated immediately upon entry into force of the U.S. - CTPA with the remaining tariffs phased out over ten years.

Best Products/Services
Power, distribution, and specialty transformers, switchgears, motors and generators, industrial controls, and steam, gas, and hydraulic turbines, and turbine generator sets.

Opportunities
The electric power market is transitioning from large-scale infrastructure project construction to the optimization of power systems already in place. However, the government's projected demand scenarios call for new power generation projects. Market potential depends largely on the increase of public and private sector industrial power demand, which would lead to the final implementation of some of the projects planned through the end of the decade. The outlook for the Colombian electricity sector is promising since the government is planning the development of several new power generation projects to accommodate the expanded demand. Additionally, the government is exploring prospects to become a major exporter of electricity (including goods and services) to the Andean region and Central America.

Some solid business prospects exist as a result of the market trend to continue using hydroelectric plants with gas-fueled thermal energy generators, including cogeneration systems. Also, electricity trading and distribution companies are focusing on reducing losses by acquiring leading-edge management and control systems technologies. Another promising business perspective is the Rural Energy Program aimed at providing electrical power to off-grid areas using renewable energy systems such as solar, wind, and small and medium scale hydro plants. This program calls for new generation systems and the recovering of existing ones. The government has taken steps to secure funding for the program. This consolidation trend will also take place in the energy power systems sector.

Resources
- CS Bogotá contact: Julio Carbó, Commercial Specialist (Julio.Carbo@mail.doc.gov)
- Association of Power Generation Companies (ACOLGEN): www.acolgen.org.co
- Energy and Gas Regulatory Commission (CREG): www.creg.gov.co
- Empresas Públicas de Medellín (EPM): www.eeppm.com
- Interconexión Eléctrica S.A. (ISA): www.isa.com.co
- ISAGEN: www.isagen.com.co
- Mining and Energy Planning Unit (UPME): www.upme.gov.co
- National Planning Department (DNP): www.dnp.gov.co
- Superintendent of Public Services: www.superservicios.gov.co
- The Ministry of Mines and Energy (MME): www.minminas.gov.co
- Transelca: www.transelca.com.co

DENMARK

Denmark has a long tradition of using renewable energy, and has since the energy crisis in 1973 Denmark sought to increase its self-sufficiency of energy. The first steps towards this were investments in energy savings and the conversion of Danish power plants from oil to coal. Later on focus was on the development of oil and natural gas recovery in the North Sea. The first subsidies for the construction and operation of wind turbines and biomass plants were introduced in 1981, and a string of energy agreements followed in the decades to come, all with the purpose of increasing self-sufficiency of energy by means of increasing production of renewable energy. Finally, in 1998, Denmark reaches its goal and becomes self-sufficient of energy.

For the last 25 years renewable energy has accounted for an increasingly share of the total energy consumption. In 15 years the share has increased from just 6.5% to 16.2% in 2006. The most important sources of renewable energy in Denmark are biomass, wastes, and wind, in order of magnitude. Currently 39% of the production of renewable energy is from biomass, while wastes and wind account for 31% and 20% respectively. Other sources such as biogas, biodiesel, and heat pumps have a minor share of the production, while solar energy, hydro power, geothermal power, and water power have an insignificant part of the production of renewable energy, mostly

due to geographical limitations. Because of geographical limitations the potential in solar energy, hydropower, and geothermal power as substantial producers of energy is minimal. However, initiatives are still taken to exploit the potential for these renewable energy resources. Denmark serves as the leading country within wind energy. At the end of 2007 more than 5,300 windmills with a total capacity of over 3,200 MW were installed in Denmark. The total capacity had a continuous increase until 2002, and since then the total capacity has stabilized. The installed windmills in Denmark produced 6,614 GWh in 2005, which covers 18.5% of the electricity consumption in Denmark. No other country in the world has a higher percentage of electricity consumption covered by wind power, and globally only 0.4 per cent of the world' electricity consumption is covered by wind power.

The Energy Agreement of March 2004 initiated a plan for substituting 175 MW old windmills with 350 MW new ones, and has furthermore assured that two new offshore windmill parks will be build. Both of these incentives should be carried out by 2009/2010, leading to 25% of the electricity consumption being covered by wind power. In a longer perspective the Danish windmill industry is operating with a target of 35% wind power coverage by 2015. When looking at the production of windmills Denmark is also the world leader. Despite a tendency of decreasing market share Danish windmill producers still account for one third of the world production of windmills, and when adding production of windmill wings and other components the world market share reaches 40%.

Best Products/Services
Denmark is a very advanced society when it comes to energy saving products, but companies and private consumers are always on the look for new innovative products that can help cut costs and save emissions. In 2009 Denmark will host the U.N. Climate Summit (COP 15). Leading up to this, Danish companies and government entities will be on the lookout for innovative products and solutions that can be highlighted at the Summit. Especially interesting are potential partnerships between U.S. and Danish companies.

Resources
- The temporary Danish website for COP15 - United Nations Climate Change Conference, Copenhagen 2009 http://www.cop15.dk/en
- Danish Wind Industry Association - http://www.windpower.org/en/core.htm
- Danish Energy Authority - http://www.ens.dk/sw11492.asp
- For more information, please contact Bjarke Frederiksen, Head of Commercial Section

DOMINICAN REPUBLIC

The Dominican Republic experiences frequent electrical blackouts that can last from a couple of hours to more than twelve hours a day. Supply shortfalls in the sector can be attributed mainly to electricity distribution companies' inability to collect sufficient funds from consumers, theft, and delays in government payments. Rising world petroleum prices and system inefficiencies have magnified the problems. Energy sector problems threaten economic competitiveness and create widespread public dissatisfaction. The government's response has included a push to increase lower cost generating capacity. The Dominican Republic's installed generation capacity is over 3,000 MW and the average daily peak demand is around only 1,900 MW. Technical and non-technical losses average 45 to 50%.

Legal Framework: There are several laws that comprise the legal framework for the renewable energy projects in the Dominican Republic. These include the following: _

- **Reform of Public Enterprises Law 141-97**: Provided the legal framework for the partial privatization of the electricity generation and distribution units.
- **General Electricity Law 125-01**: Provides preferential treatment for companies that generate electricity from renewable energy, if prices and conditions are identical to conventional generation. Companies that generate electricity with renewable energy are exempted from taxes for five years.
- **Presidential Decree 139-03**: Provides import tax exemptions for solar panels and wind turbines. _ Presidential Decree that supports the diversification of sugar mills into energy producing IPP industries. _ Incentive Law to promote industrial development in the border with Haiti regions, which includes incentives for wind, solar and all biofuels.
- **The Renewable Energy Law 57-07:** Includes the following incentives: - Tax exemptions for imports of renewable energy components - Reduced transmission fees for renewable energy electricity - Fixed feed-in price for renewable energy electricity - Income tax exemptions and fiscal incentives for self-suppliers Grants of up to 50% of investment costs (to be decided on a case by- case basis, max. 5MW)
- **The Hydrocarbon Law 112-00:** Provides funding for the promotion of renewable energy and energy saving programs. It started as a two% hydrocarbon tax income in 2002, and it increased to five% in 2005. This fund and its programs are managed by the Ministry of Industry and Commerce of the Dominican Republic. Ethanol: The United States and Brazil Biofuels Partnership Initiative, in cooperation with the Inter- American Development Bank (IDB), Organization of American States (OAS), and the UN Foundation (UNF), has completed scoping missions that include recommendations for the provision of technical assistance and feasibility studies in Haiti, the Dominican Republic, El Salvador, and St. Kitts and Nevis. These studies, to be provided by the USTDA will be used to assist governments and provide funding for public-private sector activities to develop local capacity for biofuels production and the technical and policy assistance will provide much needed consulting services for the development of a biofuels market for both local production and consumption.

Best Products/Services

- Wind power equipment and supplies
- Solar Energy production systems
- Biomass equipment
- Ethanol production equipment

Opportunities

The passage in May 2007 of the Renewable Energy Incentives Law (57-07) provides a number of incentives to businesses developing renewable energy technologies. This law was passed as part of the Dominican government's efforts to invigorate the local production of renewable energy as well as renewable energy manufactured products. The incentives include a 100% exemption from taxation on imported inputs (equipment and materials) and a 10-year exemption from all taxation on profits up to, but not beyond, the year 2020. Under the U.S. Central American-Dominican Republic Free Trade Agreement (CAFTADR)

US imports into the Dominican Republic have been classified by categories. Each category provides for the elimination of customs duties in different stages. Some products started entering the Dominican Republic duty-free on March 1, 2007, while others will receive gradual reductions on the customs duties.

The National Energy Commission (Commission Nacional de Energia) and the Bank for Agribusiness in the Dominican Republic, signed an agreement to support small alternative energy projects, especially for rural areas. They created a fund of $1.5 million to be used for the financing of biodigestors, solar panels and small hydraulic systems. The National Energy

Commission will provide the technical support and the Bank for Agribusiness will be in charge of the financing.

According to CNE**,** investment opportunities valued at $2 billion will be executed after the implementation of the Renewable Energy Investment and Incentives law. The CNE believes that by the end of the year of 2008 construction of solar and wind power projects will begin to provide 1600 MW of energy for the Dominican grid.

Resources

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ECUADOR

Ecuadorian demand for electric power has been rising at an average annual rate of 6% and is expected to accelerate as power demand builds up in response to economic growth. The total import market for electric distribution equipment, estimated at $23.2 million in 2006, is expected to grow at 15-20% per year over the next two years. The U.S. has an estimated market share of 60%, and major competitors are Brazil, Colombia, Germany and France.

The Ecuadorian government is actively working on its Energy Agenda (Agenda Energética) for 2007-2011, which includes several major projects based upon renewable-nontraditional resources such as hydro, solar, wind and geothermal sources. Its current focus is not only to increase hydroelectric capacity but also to achieve electricity efficiency. The Ministry of Electrification and Renewable Energy is deploying a national plan to induce the population to switch to energy-saving light bulbs. Expansion Of Generation Grid, Period 2007-2011

Project MW Capacity Year of Operation

1. Hydroelectric projects with state financing
San Francisco 212 2007
Chorrillos 4 2008
Poza Honda 3 2008
Mazar 190 2009
Ocaña 26 2009
Sopladora 312 2011
Total 1745

2. Private Hydroelectric projects
Abanico 23 2008
Topo 22 2009
San José del Tambo 8 2009
Sigchos 18 2010
Pilalo 3 11 2010
Total 2 82

3. Thermoelectric projects 382 2007-2011

4. Non-conventional sources 67
TOTAL 1276

Best Products/Services
The government of Ecuador considers that big hydroelectric projects should be carried out by state-owned companies rather than the private sector, since the government cannot issue guarantees on these projects. Investment on medium-sized power projects, on the other hand, can be a combination of state and private foreign investment, while small-sized power projects can be completely private. Foreign investment is also welcome in thermoelectric projects. The government's plan is to continue importing energy-saving light bulbs, and this is another important segment to consider.

Opportunities
Ecuadorian President Correa signaled that the government would concentrate its 2008 economic program on launching four electricity generation projects whose objective is to reduce the cost of kilowatt per hour. A bill was introduced in the Constituent Assembly to eliminate three oil funds holding $1.3 billion and to incorporate those resources into expedited public spending on infrastructure, including electricity and petroleum projects. In 2007, 540,000 energy-saving light bulbs were distributed, which represents savings of 5 million gallons per year of diesel and $10 million of government expenditure.

Resources
- Ministry of Electrification and Renewable Energy www.mer.gov.ec
- Oil / Power Journal journal@hjbecdach.com

ETHIOPIA

Over the next several years, Ethiopia plans to increase its capacity to generate hydroelectric power, from 800 to 1250 megawatts. Ethiopia has an untapped natural potential to generate over 30,000 megawatts of hydroelectric power, making it a potential energy exporter for the energy-starved region. There is a plan to increase the percentage of people in electrified areas from 15% to 50% and to connect all towns and villages to the national grid in 10 years. To accomplish this, there is plan to spend $1.3 billion over the next 5 years with further allocations in later years. The Ethiopian Electric Power Corporation (EEPCO) is interested in U.S. technology in this field and regularly publishes tenders for expanding and renovating the civil and hydromechanics works for current generating stations and for the planning, design and construction of additional projects. The World Bank recently approved $130 million loan in order to help expand electricity access to Ethiopia's rural population. The funding, part of the International Development Association Credit, is aimed at providing electricity access for 295 towns, villages, schools and clinics, benefiting a total population of approximately1.8 million. EEPCO signed a $150 million electric power generation project with the Chinese company CGGC in December 2006. This project will be largely financed by Chinese government (85%) with the Ethiopian government responsible for the remaining balance of the project costs. It is noted that currently power generating projects worth $3.5 billion are under progress.

Best Products/Services-
- Drilling rigs and associated equipment
- Electric and electrical cables
- Transformers, and electric meters.

Resources

- Ethiopian Electric and Power Corporation http://www.eepco.gov.et/
- The World Bank www.worldbank.org

FIJI

The country's energy needs are met from a variety of sources including hydro and diesel generation, wood, coal and petroleum products. Approximately 40% of energy needs are supplied from local resources, and 60% is met through imported fuel. According to the Reserve Bank of Fiji, the total electricity generated by the Fiji Electricity Authority (FEA) in for the first half of 2007 was around 385,530 megawatt hours (Mwh), an increase of 1.2% from the same period in 2006 Mineral oil imports during the first half of 2007 totaled US $280.2 million, accounting for 32.2% of Fiji's total national import bill. The transport sector is the main consumer of commercial fuel, mostly in the form of gasoline. Oil consumption by FEA for electricity generation accounted for 10% of fuel imports in 2006. Fiji continues to seek alternative energy sources to supplement its heavy dependence on imported fuel. In May 2007, FEA began generating electricity from the new Butoni Wind Farm which has the capacity to generate 10 megawatts (MW). The FEA has committed to having 90% of the nation's energy needs supplied by renewable sources by 2011.

Best Products/Services

Given Fiji's heavy reliance on diesel fuel, Fiji is exploring viable alternative energy sources available locally such as hydro, solar, wind and wave energy generation, and hybrids. The use of renewable energy sources is strongly encouraged by government. Government is actively seeking partners in the energy sector, as Fiji explores ways to increase its generation, transmission and distribution infrastructure, both to its urban centers and to rural users. The FEA supplies power to 57% of Fiji's population. To electrify isolated villages in rural areas, independent stations are planned. Potential suppliers must work with Fiji government authorities on these projects. The presence of small, isolated population centers on Fiji's smaller islands presents a potentially good market for tailored diesel-powered generation solutions.

Resources

- Fiji Department of Energy: http://www.fdoe.gov.fj/
- Fiji Electricity Authority: http://www.fea.com.fj/
- Pacific Power Association: www.ppa.org.fj
- Secretariat of the Pacific Community: www.spc.int
- South Pacific Applied Geoscience Commission (SOPAC): www.sopac.org.fj

FINLAND

A Nordic country, Finland shares a long border with Russia. In Finland, an advanced, Industrialized nation, energy consumption per capita is high. This is due to the cold, Severe climate, long distances, high standard of living, and structure of Finnish industry. Finland's energy consumption has increased more than 50% since the early 1970s. during the same period, industrial output and the total volume of construction. Have more than doubled. On an international scale, energy production and usage in Finland is quite efficient, corresponding to resource availability, production structure, and geographical location. Finland is the fifth largest country in Europe, but has a population of only 5.3million, Mostly concentrated in urban areas.

The share of forestland in Finland is the highest in Europe (about 70%). More than two-thirds of Finns live in urban areas; only 1.6% north Of the Arctic Circle. Finland does not have its own

fossil fuels -- coal, oil or Natural gas -- but does have bio fuels, rich reserves of peat, and extensive wood Resources. Energy-intensive industries play a large role in the Finnish economy, which has spurred the development of efficient energy systems. The pulp and paper industry supplies over Two-fifths of heat and electricity needs by utilizing solid and liquid wood residues. In Finland, peat has been defined as slowly renewing biomass fuel. It has a substantial share, 6%, of Finland's energy balance. As indigenous fuel, peat has considerable effect on regional policy. It increases employment and security of the Energy supply. In December 2003, the power utility, Teollisuuden Voima Oy, placed an order for a new nuclear power plant -- Finland's fifth commercial reactor -- from the French-German company, Framatome ANP, and the turbine plant from German Siemens. The Framatome ANP–Siemens consortium will supply the nuclear power plant unit as a turnkey delivery. The new nuclear power plant will cost about €3 billion, which makes it the largest single investment ever in Finland. The construction of a fifth commercial nuclear reactor was authorized by the Parliament in 2002 after years of controversy. The location of the power plant will be in Olkiluoto, located at Eurajoki, some 150 miles Northwest of Helsinki. The new plant was originally estimated to be operational in 2009, but the project has suffered from delays, and it is now estimated that the installation will not be ready until early 2011. The plant's power output will be about 1,600 MW. The building of the plant was begun in early 2004.

Finland is actively expanding the role of renewable energy in energy production, in accordance with the Finnish Action Plan for Renewable Energy, launched by the Ministry of Trade and Industry in 1999 and updated in 2002. The goal is to double the utilization of renewable energy sources by 2025, relative to 2001, when the share of renewable energy was about 23% -- 317 petajoules (PJ) or 7.6 Mtoe -- of total energy consumption. The increase will be achieved primarily from increased utilization of bioenergy. Wind power is rapidly gaining popularity worldwide and is an emerging form of power generation in Finland.

Best Products/Services

The development of renewable energy in Finland is expected to offer opportunities for U.S. companies in introduction of new innovative renewable energy source equipment technology U.S. companies have also a possibility to participate in cooperation with Finnish companies in TEKES (National Technology Agency) funded projects (**www.tekes.fi**).

- Technology used for pellet production
- Heat pumps for heating of private houses
- Heat exchangers and heat meters
- Controls, pumps, piping
- Boilers for district heating
- Forest chippers
- Generators, gas engines
- Technology used in agricultural biomass
- Small-scale hydro turbines
- Technology to upgrade existing hydro power plants
- Heat panels for oil heating systems.

Opportunities

Finnish energy companies use open tenders according to European Union regulations. Please see the Supplement to the European Union Official Journal. http://ted.europa.eu.

Resources

- Finnish Energy Industries www.energia.fi
- Invest in Finland Bureau www.investinfinland.fi
- Finnish Funding Agency for Technology and Innovation www.tekes.fi
- tarja.kunnas@mail.doc.gov (local contact)

GEORGIA

Best Products/Services
Best opportunities for U.S. companies exist in electricity power generation, transmission, and distribution projects. There are also export opportunities for U.S. manufactured equipment and services during rehabilitation, upgrading and management of existing plants. Opportunities for U.S. suppliers will are also in projects financed by multilateral financial organizations and bilateral assistance: the World Bank, the European Bank or Reconstruction and Development (EBRD), the Japan Bank for International Cooperation (JBIC), and Kreditanstalt fuer Wiederaufbau (KfW).

Opportunities
Georgia currently does not produce power generation equipment, with the exception of some small capacity hydroelectric turbines and electricity meters. Most installed equipment was produced in the USSR, primarily in Russia. The privatization of this sector is expected to increase efficiency and should create demand for equipment and opportunities for U.S. investors and exporters. The government plans to privatize all hydroelectric generation assets except for the Enguri Hydropower plant, expand the high voltage electricity transmission system, and refurbish and construct new hydroelectric power generation facilities.

Resources
- Georgian Ministry of Energy, http://www.minenergy.gov.ge
- Georgian State Electrosystem, http://www.gse.com.ge/eindex.htm
- Georgian Wholesale Electricity Market, http://www.gwem.org.ge
- Georgian National Electricity Regulatory Commission, http://www.gnerc.org/index-eng.html
- World Bank, http://www.worldbank.org
- European Bank for Reconstruction and Development, http://www.ebrd.com
- Japan Bank for International Cooperation, http://www.jbic.go.jp/english/index.php
- Kreditanstalt fuer Wiederaufbau, http://www.kfw.de/EN_Home/index.jsp

GHANA

According to statistics obtained from the Statistical service of Ghana, the U.S. is the leading exporter of Electrical Power Systems to Ghana exporting$ 30 million worth between January and May 2007. The U.K. followed with $19.4 million and China with $15.3 million.

Ghana is emerging from the midst of an energy crisis where demand was controlled through load shedding, a schedule of rolling black outs (one 12 hour period every 5days) for the past year. There is however currently an estimated demand deficit of 600MW. Completion of the West African Gas Pipeline, which will provide relatively inexpensive gas for industrial usage, has been delayed and is now expected to be completed by the first quarter of 2008. Once on line, the Government plans to increase generating capacity to 2600MWvi, primarily through gas-fired plants financed by independent power producers. Capital investment by the utilities is expected to help stimulate the market for generation, transmission, and distribution equipment.

The government is to spend $470 million within the next three years to improve the energy generating capacity of the country. The Volta River Authority, the power generating agency of the country, has procured a 126 megawatt power plant which is expected to be on line in early 2008. The government is currently reviewing a number of power generation projects, including a 300 MW IPP thermal power plant in Team, an and expansion of an existing power plant in

Gatorade by 110 MW. The government has also begun work on a Chinese funded Dam project, which will add an additional 400megawatts generating capacity in 3-5 years. Additionally, the country needs to upgrade the aging transmission and distributions systems. The cost of this upgrade is estimated to be $1.9 billion

GREECE

The Greek market for new thermal and renewable energy power plant projects and equipment (ELP-REQ) was estimated to be $1,900 million in 2007. It grew over the 2005-2007 period at an annual rate of 10-12% as Greece is expanding its electricity generating capacity and updating its equipment. The majority of this growth was realized in the construction of new power units. According to the 2008-2012 Greek Energy Development Program, announced in mid October 2007, Greece plans to spend $12 billion on the development and expansion obits energy sector during this period, of which $ 9 billion will be for new power plants.

Deregulation of the multi-billion dollar electricity market in Greece in February 2001through the new law approved by the Greek Parliament in December 2005, completed Greece's harmonization with EU Directive 2003/54/EC and provided for the gradual deregulation of the electricity market in July 2007. The New Law for renewable energy, as well as the new Natural Gas Liberalization Law, the completion of the legal framework with a number of Presidential Decrees, and the increase in power/electricity demand, created the necessary conditions for foreign investment and for large-scale investment initiatives in energy sector, especially for new power plants, and reinforced competitiveness. It also means that U.S. companies have new export opportunities to export technology, equipment, and serve as consultants in the Greek energy market.
A dramatic increase in sales is expected to take place between 2009 and 2012, when new privately owned, thermal power plants with an estimated capacity of 9,500 MW will be under construction, and three or four old ones with a capacity of around 2,500MW will be modernized, and equipment required for the implementation of these projects will be purchased. In addition to the thermal power units, Greece has made a stated commitment for greater usage of RES in the total domestic electricity production, i.e., from 8.4% in 2002 to 20.1% in 2010. The increase in the installed capacity of wind parks to 2,500-3,000 MW will help Greece achieve this goal by 2010. By the endow 2007-wind turbine installed capacity reached around 800 MW and by 2010, the GO forecasts that the installed wind energy capacity will be 10.09%.

Best Products/Services
U.S. firms have very good sales opportunities for the following products: gas generating sets; cogeneration systems including gas and steam turbines for medium and small size enterprises, automatic circuit breakers; switchgear and parts; insulators and transformers.

Opportunities
In the near term, energy market liberalization and solid growth in demand will create significant opportunities for U.S. firms in this industry sector. U.S. manufacturers, exporters, and consulting or engineering firms will enjoy new opportunities for supplying, contracting or subcontracting in the Greek energy market. In addition, the Greek Public Power Corporation (PPC) is planning to build and modernize the following power stations:

- Megalopolis V natural gas/ lignite combined cycle power unit, 800 MW, in 2011
- Militia II / lignite power unit, 450 MW, in 2012
- Livery VI / coal power unit, 700-800 MW, in 2013.
- Kazan region / lignite power unit, 250-400 MW, in
- Polyamide region / lignite power unit, 250-400 MW, in 2012

- ¸ Larine region/ coal power unit, 550-650 MW, in 2014.
- ¸ Two new combined cycle units burning oil and natural gas with 250 MW capacity each, will be developed on the island of Crete
- ¸ Livery V / gas power unit with a capacity of 400 MW, expected to start operating in 2009.
- PPC is also replacing its outdated lignite-burning units by 2020, with total capacity of 2,500 MW.
- The following new power units are also expected to be developed by private companies and/or consortia of private companies with PPC and other Greek government controlled entities:
- HELPE (Hellenic Petroleum): 4 new stations (1 Wind Park, 1 lignite and 2 natural gas) with total capacity of 2,000 MW by 2012.
- ¸ DEPA (Natural Gas Company): 15.5 MW natural gas-fired units on the island of Remvithousa, Attica.
- ¸ 600 MW coal burning unit in Astakos, Aetoloakarnanias by Edison S.pA.
-
- ¸ 400 MW combined cycle unit in Viotia region by Edison/Helleniki Technodomiki and Viochalko consortium.
- ¸ 440 MW natural gas plant by Endesa Hellas located in the industrial zone of Volos region in Greece. A new natural gas plant developed by Halyvourgiki Inc. and PPC in Elefsina with 880 MW.
- 600 MW coal burning unit in Aspra Spitia, Viotias.
- ¸ 420 MW coal-burning unit Madoudi, Evia region.
- ¸ 5 hospitals in Attica region supplied with cogeneration units.
- ¸ 2 new privately owned plants of 300 MW total capacities, 150 MW each, burning natural gas to be developed by Hellenic Transmission System Operator and two private companies.

The Fourth Community Support Framework Programs (IVCSF) will provide a majority of the funding for these projects. In addition, the National Operational Program for Energy (N.O.P.E.) and the Operational Program for Energy, (EPE), will also provide funding.

Resources

- http://www.ypan.gr
- http://www.rae.gr
- http://www.dei.gr
- http://www.eurelectric.org

GUATEMALA

Guatemala's electric sub sector has changed significantly in the past two decades. In the 1980's, 50% of all generation came from hydroelectric power and the state owned company INDE was the main source of energy. In 1996, a law was enacted that opened the market for new private investment and privatized the commercialization of energy. Generation shifted overtime and now Guatemala's electricity is 55% thermal, 33%ydro, and 3% geothermal, and 9% cogeneration. The energy sub sector in Guatemala is comprised of the Ministry of Energy and Mines (MEM), the "*Commission Nacional de Energia*" or National Energy Commission (CNE), the"*Mercado Mayorista*" or wholesale and spot market coordinator, the state owned company INDE (owns the major hydroelectric plants and most of the distribution lines), an excess of 20 privately owned generation companies, and three commercialization companies. The MEM forms policy and the CNE sets regulations.

In 2007 the Guatemalan government made official the latest reforms to the energy sector by publishing the *Acuerdo Gubernativo 68-2007* (reforms the General Electricity Law) and the *Acuerdo Gubernativo 69-2007* (reforms to the rules of the Administrator of the Wholesale Market) in the *Diario de Centro America* (Guatemala's official gazette) on March 1, 2007. Overall, analysts believe that the lowering of barriers will lead to new entrants to the market, more competition, new investment, and better coverage and quality of service. Furthermore, it is hoped that the new scheme will reverse Guatemala's dependence on fossil fuels by allowing small renewable energy projects.

Starting in the late 1990's there has been a push in the Mesoamerican region towards integration, regional development and regional infrastructure. The centerpiece of this effort is the Plan Puebla-Panama, an initiative to bring sustainable development to the southern part of Mexico, Belize and the Central American countries (Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama).The Central American Electrical Interconnection System Project (Proyecto del Sistemade Interconexion Electrica de los Paises de America Central –CIEPAC-) is one of the components of the Plan Puebla-Panama, with the objective the establishment of a wholesale electricity market and the development of the first regional transmission system. The power transmission line would have a length of 1,830 kilometers and capacity to transport 230 megawatts of power. The entire project has an estimated cost of $320 million, for which the Anti-American Development Bank (IDB) has already approved a $170 million loan. Among other things, the project will require the construction of substations and transmission towers. When completed, intra-regional electricity annual sales will be around $200 million.

Best Products/Services
The following is a list of the most promising sub-sector categories within the industry for the next year:

- Electrical power generators
- Transformers
- Hydraulic turbines
- Circuit breakers
- Switchgears
- Conducting cable
- 9Parts of steam and other turbines

Opportunities
In his inauguration speech on January 14, 2008, President Colom presaged the possibility of energy rationings in the future if demand keeps growing and there are none investments. As a short-term solution the Ministry of Energy and Mines would like to speed the implementation of the Mexico-Guatemala interconnection project with atonal cost of $55.8 million. As a long-term solution, the government would like to exploit the country's renewable energy potential through environmentally responsible investment. It is expected that for the short term transmission lines and sub-stations for interconnection and renewable energy projects provide the best opportunities within the sector.

Resources
- Ministry of Energy and Mines: www.mem.gob.gt
- National Electrical Energy Commission: www.cnee.gob.gt
- Transaction Management Institution: www.amm.org.gt
- Commercial Office in Guatemala: www.buyusa.gov/guatemala

HONDURAS

Honduras has a current installed capacity of 1150 MW. Energy demand in Honduras is growing at approximately 10% a year. The increase is due to population pressure and economic growth, as well as subsidies, illegal hookups and non-payment of legal hookups, all of which eliminate any incentives to conserve energy. The National Electrical Energy Company, ENEE, is widely considered bankrupt and is losing hundreds of millions of dollars each year.

Approximately 36% of the total of fuel imports is utilized for thermoelectric generation, a situation that has contributed to the county's internal deficit. As such, expansion of power production using renewable energy technologies is considered one of the priorities in current energy policy. At present, electrical power coverage in Honduras is 62%, which means that approximately 2.5 million citizens (particularly those living in rural areas), do not have access to electricity. With demand growing rapidly, especially in the industrial, commercial, and residential sectors, ENEE needs to conduct expansion efforts aimed at extending its transmission grid to incorporate rural
communities in Honduras, as well as expanding the distribution capacity in high growth areas.

Best Products/Services

- Turbines
- Electrical Power Generators
- Solar Power Systems
- Parts of panels, boards, consoles and transformers
- Circuit Breakers
- Switch Gear
- Conducting Cable

Opportunities

The Honduran territory has great potential for energy generation through renewable sources, estimated at 13,268.43 MW. Most promising projects are in the areas of hydro, biomass, co-generation, wind, and geothermal sources. Under the country's energy policy action plan for the period 2005-20014, aimed at reducing the country's dependency on fossil fuels, energy generation through renewable sources is expected ton crease by 27% (approximately 350.4 MW of installed capacity). In particular, the potential for hydroelectric generation is significant (around 3,200 MW). Financing support in this sector is primarily led by the Central American Bank for Economic Integration (CABEI). Rural electrification is another key component of the country's energy agenda. Under Epee's Strategic Plan for National Electrification, electrical power coverage in Honduras is expected to increase from 62 to 75% by the year2008, though severe financial difficulties at the state-run company make attainment of that goal unlikely. Despite Epee's financial woes, the increasing demand for energy, and therefore themed for additional installed capacity, is real. Estimates of such demand vary but an average of an additional 100 MW/yr through 2015 seems a reasonable figure.

Regardless of the manner in which such energy is produced, there will be a demand for turbines, especially those that can be available in the near term. The most likely sources of such new installed capacity seem to be coal and biogases, with hydro and biodieselalso possible. While blackouts and brownouts are widely expected to hit Honduras in 2009, they are already happening in the North Coast (San Pedro Sula, Cortés, and La Ceiba) as well asRoatán. These blackouts are due to lack of local installed capacity and distribution problems, respectively. Accordingly, there is a demand for reliable, emergency power generation systems such as generators. Many maquilas (garment factories) in the North Coast and hotels in Roatán have

either purchased their own generators or are actively considering their options. Lastly, some hotels in Roatán that are not yet connected tithe grid are reportedly considering solar power systems.

A recently passed Renewable Energy Law, designed to promote the development and use of non fossil based domestic energy sources, may help promote development in this sector. The new law provides significant incentives for renewable energy projects such as a tax holiday on profits for projects under 50 MW installed capacity, and tax exemptions on imported machinery for 12 or 15 years, depending on the size of the project. If renewable energy production does increase, the potential market for power generation equipment would be approximately $200 million, representing a strong opportunity for U.S. firms.

The Inter-American Development Bank has announced the approval of a $ 350,000grant from its Fund for Special Operations to support energy efficiency and biofuel Energy and Climate Change (SECCI) Initiative. The grant will support preparation of investment plans and loans for energy efficiency measures and the development of technical studies, including that related tithe implementation of a national program to produce and promote befouls in Honduras.

Resources

- Ministry of Natural Resources & the Environment http://www.serna.gob.hn
- National Electric Company http://www.enee.gob.hn
- National Energy Commission http://www.cne.gob.hn
- Central American Bank for Economic Integration http://www.bcie.org
- Regional Trade Statistics http://www.sieca.org.gt
- CAFTA-DR Website http://www.export.gov/cafta
- Regional Commission for Electric Interconnection http://crie.org.gt
- Energy and Environment Partnership with C.A. http://www.sgsica.org/energia
- Central American Commission For Environment
- And Development http://www.ccad.ws
- Plan Puebla Panama Initiative http://www.sre.gob.mex
- Inter-American Development Bank http://www.iadb.org/ppp
- Energy Information Administration http://www.eia.doe.gov
- Honduras Trade Portal http://www.hondurastradeportal.com
- SIEPAC Network Company http://www.eprsiepac.com
- Presidential Modernization Commission http://www.sse.cpme.gob.hn
- US Trade Shows under the 2008 International Buyer Program Schedule of the U.S. Department of Commerce:
- Power-GEN International http://www.powergen-international.com

HUNGARY

By 2020, Hungary hopes to increase renewable energy production to 13% of total energy production. Under the EU's energy policy, member states must fully liberalize energy markets. The Hungarian Parliament is considering a national energy strategy through 2020 in harmonization with the EU liberalization requirements. Hungary still relies heavily on Russian oil and gas exports. Hungary imports 80%of its total oil consumption, and over 80% of this, 6.9 million tons/year, comes from Russia. Hungary is also unique in the EU in that it uses more natural gas than oil.

In 2007, renewable energy accounted for only 4.9% (190 MW) of total energy production, compared with 6% in the EU. Hungary hopes to triple its reliance nonrenewable energy by 2020,

mostly from smaller power plants. To achieve this goal, Hungary's Energy Office is licensing 300 small, mainly renewable plants with capacities of less than 50 MW each. The government has committed to boost the country's share of renewable energy use to 8.3% by 2013. The government will also channel over $200 million in EU development funds into renewable energy projects in biomass, biogas, and geothermal energy. Bio-fuel: Hungary hopes to achieve bio-fuel production of 200,000 tons per year, up from 70,000 tons; This will require three million tons of raw materials – mostly corn and wheat. Also promoting bio-fuels for vehicles is E85, a new excise tax-free bio-fuel that became the official EU standard in January 2007. Saab and Ford are bringing out compatible vehicles, and there were a dozen E85 filling stations in Hungary by the end of 2007.

Biomass: energy from plants - represents currently the largest source of renewable energy in Hungary, over 70% share. Biogas: Hungary has significant agricultural production and could become a significant biogas producer. Hungary will increase its biogas production four or fivefold in the next three to five years due to stricter EU regulations for agricultural waste handling. Since 2003, a number of biogas plants have been established in Hungary, with capacities ranging between 1.7 to 3.5 MW.Wind Energy-Hydro Power-Solar Power: In 2007, Hungary has wind energy capacity of60.8 MW, generated from nineteen different wind farms. Additionally, hydro power capacity is 40 MW from over twenty different power plants. Unfortunately, further hydropower development is unlikely, with the exception of small and micro sized plants. Solar power is relatively undeveloped. A small number of residences and community buildings, like hospitals, use roof-mounted solar panels to supplement heating units.

Opportunities

The Government of Hungary hopes to extend incentive packages to companies investing in renewable energy sector in order to increase output of renewable energy. Investments, Hungarian and foreign, in large-scale wind turbine developments, above1,500 MW, are strongly encouraged, as the electrical grid does not yet have the capacity to handle the increase. An efficient electrical system capable of collecting and storing energy is needed to effectively harness the uneven output of wind farms.

Hungary has more geothermal energy potential than any current EU member, but it is still largely untapped. Only a few of Hungary's geothermal springs are harnessed for heating energy, and none for commercial use. The exploration and utilization of such Geothermal springs are also strongly supported by the government.

Resources

- Green energy on-line: www.zoldtech.hu
- Elmib Energy Efficiency e-News: www.elmib.hu
- Hungarian Energy Office: www.eh.gov.hu
- Ministry of Economy and Transport: www.gkm.gov.hu
- Commercial Specialist – Csilla Vegh: csilla.vegh@mail.doc.gov

INDIA

Both government and private sector firms generate electric power in India, with the government sector leading the pack. National Hydroelectric Power Corporation, National Thermal Power Corporation and various state level corporations (state electricity boards - SEBs) are the major players. The transmission and distribution is by the State Electricity Boards (SEBs) or private companies. There has been significant improvement in the growth in actual generation over the last few years. As compared to annual growth rate of about 3.1% at the end of 9th Plan and initial years of 10th Plan, the growth in generation during 2006-07 and 2007-08 (up to September, 2007)

was of the order of 7.3% and 7.6% respectively. The U.S. continues to be one of the largest exporters of generation and transmission equipment to India along with Germany, Japan and U.K. However, the current electric power supply is 30% less than the demand. To support the rapidly growing Indian economy, the governments must increase electric power production immediately. The financial losses of the power sector remain a burden on public sector finances. The World Bank, ADB and other international agencies have recommended power sector related reforms in the country.

India's power sector is plagued by capacity shortages, resulting in frequent blackouts, poor reliability, and deteriorating physical and financial conditions. National surveys of industrialists consistently rate power supply as one of the most critical constraints. With responsibility for electricity supply shared constitutionally between the central and the state governments, the Government of India (GOI) has placed increased emphasis on improving the efficiency of supply, consumption, and pricing of electricity. Only reforming power sector management and financing at the state level can achieve this.

The source of the state of the power sector's ailments is poor operational efficiency of the State Electricity Boards (SEBs), which form the foundation of India's power system. Due to subsidized tariffs to residential and agricultural consumers, low investment in T&D systems, inadequate maintenance, and high levels of distribution losses, theft, and uncollected bills, the SEBs are continually in severe financial distress. SEBs are not able to provide quality supply and efficient service to their customers. In several Indian states, the power sector is a major drain on already limited state budgets. Although publicly reported total energy losses are about 21%, closer examination of the losses of SEBs shows that there is often significant underreporting.

The sector's heavy reliance on increasingly tight state budget resources has been the key obstacle to expanding access to electricity to consumers and upgrading systems. SEB losses and power subsidies are also a major drain on state budgets and crowd out public spending on critical sectors such as health and education. Power sector reforms are critical for providing the impetus to states' economic growth and for redirecting public spending to priority areas. The financial weakness of the SEBs has also been one of the major stumbling blocks. The GOI, with World Bank assistance, has been encouraging the states to undertake in-depth power sector reforms. This involves distancing the state government from operation of the power sector, establishing an independent regulatory framework for the sector, progressively reducing subsidies and restoring the creditworthiness of the utilities through financial restructuring and cost-recovery based tariffs, and divesting existing distribution assets to private operators. The GOI now seems focused to lead the Transmission and Distribution (T&D) oriented reforms, because it believes that without a proper T&D network, generation becomes meaningless.

According to the Indian Ministry of Power (MOP), a 107,000 MW power capacity needs to be added before 2012 to bridge the demand gap. About one-fourth to one-third of this growth will come from Independent Power Producers (IPPs), with the rest coming from the public sector. It is estimated that building 100,000 MW in additional power capacities and associated transmission & distribution infrastructure will require an investment of $ 170 billion.

Opportunities

Given GOI's commitment to push through reforms and recent policy initiatives to encourage T&D, the demand for T&D equipment is expected to grow. American power equipment suppliers will find significant sales opportunities in power distribution transformers, high voltage power cables, relays, conductors, capacitors and circuit breakers. There are excellent prospects in Supervisory Control and Data Acquisition (SCADA) and Energy Management (EMS) systems to effectively integrate distribution automation with demand side management. Indian T&D

companies are seriously exploring their right-of-way to establish fiber-optic and telecommunication networking or new commercial opportunities in the cable Internet and e-commerce operations

Resources
For more information about export opportunities in this sector contact US Commercial Service Industry Specialist

- Radhakishore Pandrangi at: pandrangi.radhakishore@mail.doc.gov

Useful Links include:

- Ministry of Power: www.powermin.gov.in
- Confederation of Indian Industry: www.ciionline.org
- Federation of Indian Chambers of Commerce and Industry: http://www.ficci.com/

INDONESIA

Indonesia has been experiencing a power crisis since 2004 as a result from a lack of new investment in power plants between 2000-2005. With an average growth rate of8.3% per year, electricity demand will increase from 97.91 giga watt hours (GWh) in 2004to 145.72 GWh in 2009. The electrification ratio is expected increase to reach 67.9%and new customers will increase by 10 million in the next five years. The government has projected that the financial requirement for power development during 2006-2014 is$41 billion, with power plant development $26.36 billion, transmission $7 billion and distribution $8 billion The total market value for electrical power equipment in Indonesia was $577.8 million in2005. Indonesia imported $550.8 million electrical power equipment in 2005. The market share of US products was 13% of the total value of imported product (or $73.2million in 2005). The other major suppliers for this industry in Indonesia are Singapore, Japan, France and Germany.

Imported U.S. products comprised $61 million or around 13% of the total import value of electrical power equipment in 2004. As the market size increased in 2005, the imported value of US products also increased to $73.2 million in 2005. Indonesian companies usually import U.S. products directly or through the agent/distributors in Singapore. It is estimated that the value of imported products from the US will increase by 20% in 2006.U.S. companies are strong competitors in parts for boilers, parts of auxiliary plants for use with boilers, parts for turbines, electrical generating sets, other transformers, lightning arresters, junction boxes, panel boards, and electrical conduits.

Opportunities
The GOI recently launched a crash program to provide an additional supply of 10,000MW until 2009. Around 8,000 MW would be developed by private companies and thirst would be produced by PLN, the state-owned electricity company. In 2007, the GO predicts that the investment for this industry will reach $3.3 billion. Construction of power plants and transmission lines in Indonesia should bring significant commercial opportunities for US companies that supply engineering services and equipment such as turbines, substations, transmission and distribution equipment.

Resources

- Directorate General of Electricity, Ministry of Energy and Mineral Resources Website: http://www.djlpe.esdm.go.id/
- PT Perusahaan Lipstick Negara Website: http://www.pln.co.id

IRELAND

The Irish electricity market is fully liberalized and open to competition since February2005. The sector has experienced major re-organization in recent years as the Irish government implemented EU deregulation and liberalization proposals for the power generation and transmission sector. Fully dispatch able plant capacity was 6,445 MW in2007. Total system demand is just below 29,000 TWh annually and growing at approximately 3.5% annually.

The Commission for Energy Regulation (CER) is the independent body responsible for overseeing the liberalization of Ireland's energy sector. The dominant local player is the utility – Electricity Supply Board (ESB). ESB PG (Power Generation) is the largest (60%) owner of Irish generation capacity. ESB PG must close or divest 1,300 MW of existing power plant by 2010 to ensure its market share is reduced to 40% by 2010. It is forecast that this development will result in Ireland having 430 MW less dispatch able capacity in2011. ESB PES (Public Electricity Supplier) is the monopoly electricity supplier to customers in Ireland. DSO/MRSO is the operators of the Distribution System and Meter Registration Systems respectively. While these activities are licensed individually, the current holder of both licenses is the ESB. Ownership of the transmission system rests with the ESB as transmission asset owner (TAO) while Sigrid acts as the Transmission System Operator (TSO).

Best Products/Services

Given the continued strong growth in electricity demand, there are concerns about Ireland's ability to cope with possible electricity supply/demand shortfalls especially given the country's relative isolation from the European electricity network. An interconnector, with a net transfer capacity of 330MW, with Northern Ireland represents Ireland's sole connectivity to the European network. The Single Electricity Market for the island of Ireland went live in November 2007 following completion of the joint Ireland/Northern Ireland All-Island Project (AIP). EirGrid is proceeding with plans to construct a 500 MW East-West inter-connector with the UK. The competition process was launched in September 2007 with the intention to award the contract during 2008 tonsure the inter-connector can be operational by 2012. As Ireland imports approximately 90% of its primary energy requirements, renewable energy is attracting substantial attention across the commercial and political spectrum. Renewable sources account for 8.6% of electricity generation. The Irish government plans to raise this to15% by 2010 with a further target of 33% by 2020.

Opportunities

U.S. companies have achieved success in supplying technology, equipment, and systems to Irish powered operators. The ESB's ongoing investment plans for upgrading its powered assets, transmission and distribution networks allied with IPP investment in new generation capacity as well as sustainable energy developments offer excellent opportunities going forward.

Resources

- http://www.dcmnr.gov.ie/Energy
- http://www.cer.ie
- http://www.esb.ie
- http://www.eirgrid.ie
- http://www.sei.ie
- http://www.e-tenders.gov.ie/

ISRAEL

The state-owned Israel Electric Corporation (IEC) is Israel's only integrated electric utility with full ownership and control over the transmission and distribution networks and 98% of the generation capacity. The company owns and operates 17 power stations sites (including 5 major thermal power stations) with an aggregate installed generating capacity of 10,899 MW.In 2006, the IEC sold 46,175 GWh, of electricity. For the past decade, demand for electricity has grown at an average annual rate of 5.5%. Israel's electricity network is not connected to those of the neighboring countries.

To meet increased electricity demand, the company has made substantial investments in the construction of new generation facilities and for expansion and improvements to its transmission and distribution systems. To meet projected future electricity demand, the Company's capital investment program provides for an installed capacity of 15,000MW by the end of 2010, by adding 6 combined cycle plants as well as wind turbines providing 150MW. The implementation of these plans will require investments of at least $1.2-1.3 billion annually. IEC's expansion plans have been delayed due to the government's plans to privatize/restructure the company.

Independent Power Producers (IPP)The Electricity Law provides the framework for the increase of IPP's to 20% of Israel's installed generating capacity. The infrastructure for the supply and distribution of natural gas to its industry is in an advanced stage of development. An offshore pipeline along the coast has been completed and an overland transportation system is being built. IEC is in the process of converting its oil-driven power stations to natural gas. Last year, the Electricity Authority issued several licenses for IPPs including those to Dorad for an 800MW power station and for combined cycle plants at Nesher Cement Works, Dead Sea Works, Hadera Paper Mills, Dalia Power, and the Via Maris desalination plant. In addition, several existing industrial combined cycle stations will be converted to natural gas. The Ministry of National Infrastructures (MNI) is cooperating with the industry in removing the remaining regulatory obstacles to the development of the IPP sector, e.g. by establishing a safety net for IPP developers. In MNI is expected to issue a tender shortly for two BOT solar energy plants in the Negev with a total capacity of 250MW. In 2007, IEC purchased approximately $20 million worth of electricity from IPP's. In 2008, this number is expected to increase by 60%.Natural Gas Supply

Israel has been in negotiation with British Gas, the owner of drilling rights for a gas field located off the Gaza shore, as a potential supplier of natural gas. In addition, MNI is holding discussions with several suppliers and governments for the supply of natural gas and the building of a pipeline corridor from Turkey to Israel along the Mediterranean coast. Israel remains a good market for U.S. suppliers of equipment and services to the energy sector. With the favorable dollar exchange rate, U.S. equipment suppliers currently enjoy a price advantage over EU-based manufacturers.

Best Products/Services
Electrical Power Generation, Transmission and Distribution Equipment

Opportunities

1. IPP's, in particular cogeneration plants; conversion of existing cogen plants to natural gas.
2. Renewable energy power stations, i.e. a solar energy plants and wind driven turbine generators.

Resources

- Ministry of National Infrastructures
- Israel Electric Corp.

KENYA

As is the case for many Sub-Saharan countries, Kenya suffers from low-quality, high-cost utilities. According to some members of the American Chamber of Commerce of Kenya (ACCK), when indirect costs associated with brownouts, blackouts, power surges, damage to equipment, and back-up and emergency electrical power sources are factored into the nominal cost of electricity off the grid, Kenya's electricity costs are the highest in the world. The major sources of electricity in Kenya are hydroelectric, geothermal, thermal, and imports from Uganda. Total installed capacity is 1235 megawatts (hydroelectric 677 MW, oil-based thermal 407 MW, geothermal 121 MW, and imports from Uganda of 30 MW). With effective capacity of 1176 MW, demand in November 2007 reached 1031 MW. Kenya therefore has a power surplus of 145 MW, a reserve margin of just 7% under normal weather conditions. Like many of its neighbors, Kenya has experienced alarmingly severe climate pattern changes creating alternating drought and flood conditions. The gap between installed and effective capacity points to significant system losses in transmission and distribution and the need for investment in both areas. Industry analysts expect peak demand to reach 1153 MW against a supply of 1185 MW in 2008. Demand for electricity is expected to grow by at least 8% annually, reaching 1250 MW 2010 and 3076 MW by 2020.

The industry is split into three government agencies. The government-owned Kenya Electricity Generating Company (KENGEN) created in 1997, carries out most power generation, supplemented by a handful of private sector investors licensed as Independent Power Producers (IPPs). KENGEN owns most generation facilities and supplies about 85% of electricity demand. KENGEN also has aggressive investment plans for the coming decade and will hire a financial advisor shortly to ensure their capital is employed productively. Kenya Power and Lighting Company (KPLC) hold the exclusive rights to distribute, market, and sell electricity in Kenya. KPLC has power purchase contracts with KENGEN and the IPPs. The Electricity Regulatory Board (ERB), set up in 1998, regulates the electricity and power sector including approval of electricity tariffs. The Ministry of Energy oversees all activities within the power sector. Currently, there are three active IPPs with total installed capacity of 143.5 MW. These are Iberafrica Power Limited, 56.5 MW (diesel), Or Power 4 Inc., 12 MW (geothermal, to be increased to 48 MW in early 2008), and Tsavo Power Company 74 MW (diesel).

Another source of grid supply is through an import contract with the Uganda Electricity Transmission Company (UETC). There are also seven isolated power stations, five of which belong to the government's rural electrification program and two to KENGEN. The parastatal Mumias Sugar Company began bagasse cogeneration in 2007, supplying 2 MW to the national grid. A single buyer model has been adopted for the electricity industry: KPLC is the sole power transmission and distribution utility and also manages the rural electricity program. Two river basin development authorities, Tana and Athi Rivers Development Authority (TARDA) and Kerio Valley Development Authority (KVDA), own some of the dams for KENGEN hydroelectric stations and are responsible for planning and co-ordination of development activities in their respective river basins.

New transmission lines are planned for construction and commissioning through 2008 and include the 100 km 220 KV Olkaria – Nairobi double circuit, 140 km Kiambere – Nairobi single circuit and the 140 km 220 KV Kamburu – Meru single circuit line. Both projects are in progress. While the total Kenyan power is expected to grow at 8% annually in real terms for the next few years, demand for items such as transmission lines and switchgear may grow at a faster rate. Demand for replacement equipment at existing facilities will also be a major factor.

Although installed capacity is relatively small (compared to 50,000 MW in the U.K. and 31,000 MW in South Africa, for example), Kenya is the leading generator in Eastern Africa. Access to electricity in Kenya is only about 16%, with much of rural Kenya without any electrical power whatsoever. KPLC has formal electricity supply contracts with only about 650,000 customers, of which only 80,000 falls under the rural electricity program. The country's highest achieved annual sales were 3,801 GWh. The transmission network comprises about 3000 km of 220 kV and 132 kV transmission lines, and 20,000 km of distribution lines on 66 kV, 40 kV, 33 kV and 11 kV. Low voltage lines operate at 240 V and 415 V total about 22,000 km.

Best Products/Services

- Drilling rigs and associated equipment
- Electric and electrical cables, transformers
- Electric meters
- Electric poles, and switchgear.

Opportunities

Areas of particular interest to foreign suppliers include the continuing Rural Electrification Program, technical improvements to the distribution grid -- and geothermal, bagasse cogeneration, and thermal power generation projects. The GOK plans to create a statutory body to further implement the Rural Electrification Program with the aim of enhancing connectivity to at least 40% by 2010. It is expected that about 450 MW of geothermal, 450 MW in direct imports, 400 MW from diesel plant, and 360 MW from combined cycle plants will be installed by 2025.

Current development plans indicate that only about 80 MW of new hydro capacity will be added during this period. Although the World Bank previously withdrew funding for a geothermal project, funding resumed in 2004 following the passage of legislation to curb corruption. The GOK is committed to accelerating the Geothermal Resource Assessment (GRA) to facilitate designation of geothermal energy as a least-cost source of electricity supply. There is no local production of any of the equipment covered in this section.

Other opportunities include future investment in KPLC, occasioning, the privatization of isolated power stations to improve efficiency and lower power costs, the financing of power expansion projects with private funding instruments, the manufacture and fabrication of electrical equipment such as transformers, cables and switchgear; and a joint venture for a purpose-built facility of up to 600 MW for a Canadian firm with 30% U.S. ownership engaged in mining activities in the Coast Province. There are some under-developed hydroelectric sites, but they may be more expensive to develop than other alternatives. The electricity supply industry faces various challenges. Given that about 70% of generation is derived from hydropower, power supply is highly vulnerable to weather conditions. There is, however, a shift towards geothermal energy in the future alongside thermal generation.

Rising fuel costs continue to have an impact on power prices and the economy. Another great challenge is the level of system losses, currently estimated at 20%. This level is expected to be brought down to 15% in the next three years. Electricity sales and revenues are vulnerable to the business performance of large power customers, who account for almost two-thirds of total sales but are only 1% of the customer base. Although there is high potential for growth, traditional reliance on foreign loans to invest in infrastructure has suffered with KPLC's poor financial performance. The level of technical losses has therefore risen. Power supply interruptions and maintenance costs for the distribution network are high as well.

A Canadian company holds a two-year renewable contract to manage the publicly owned national power distributor, KPLC. The company intends to increase demand and revenues by improving

service quality, offering customers a variety of means to pay their bills, and through advertising and promotion campaigns. For example, KPLC plans to reduce power outages from the current 11,000 per month to 3,000 within two years while increasing the number of new subscribers from the current 40,000 to 150,000 per year. An expanded customer base will result in higher revenue, particularly with streamlined connection policies, outsourced operations, and establishment of customer group schemes. Funding initiatives should enable construction work to commence without waiting for full advance payments by customers.

Resources

- Electricity Regulatory Board – www.erb.go.ke
- Kenya Electricity Generating Company – www.kengen.co.ke
- Kenya Power & Lighting Company Ltd – www.kplc.co.ke
- Ministry of Energy – www.energy.go.ke

LIBYA

Libya currently has electric power production capacity of about 5.0 gig watts. The Libyan General Electric Company (GECOL) runs 23 generating plants, of which six are steam-powered and seventeen run on gas or diesel fuel. Power demand is growing rapidly (approximately 8-9% annually), and Libya has plans to more than double current installed capacity by 2010 at a cost of over $3.5 billion. About 60% of current power stations are oil-fired, although GECOL has announced plans to make a major effort to switch to gas-fired turbines. Libya's power generation and distribution sector requires substantial investment, and officials are looking at alternatives to public financing. Tenders for major generation projects have been issued in the last several years, including a 250 MW project in Sarir,an 800 MW project in Sirte and a 750MW project in Misurata, but the bid selection process has been slow and lacking in transparency. There have been several large contract awards announced in late 2007/early 2008, to include:

- GECOL contract with Areva (France) for $440.6 million to work on Libya's power distribution network
- Hyundai Engineering & Construction (South Korea) reported that it has won a $717 million orders to build a thermal power plant in Libya
- Doosan Heavy Industries & Construction Co. (South Korea) announced that it had won a $267.5 million order from GECOL for a power plant

Best Products/Services

Engineering, architectural design, advanced construction techniques, major project coordination, training.

Opportunities

Power plant upgrades and new construction, project management, engineering services.

Resources

General Electric Company of Libya (GECOL): http://www.gecol.ly/en/index.php

LITHUANIA

Privatization and restructuring of the Lithuanian energy sector is ongoing. By agreement with the European Union, Lithuania will decommission the Ignalina nuclear power plant, which generates up to 90% of the country's electricity. The first of the plant's two reactors closed on December 31, 2004; the second will cease operation in 2009. Lithuania imports approximately 60% of its energy resources, including oil, gas, nuclear fuel, and coal. The production capacity of Lithuania's power plants and oil refinery exceeds domestic demand, making the country a net

exporter of electricity and petrochemicals, but electricity exports have dropped sharply since Lithuania took one of Ignalina's nuclear reactors offline. Lithuania has no gas fields, and imports all of its natural gas from Russia. Gas accounts for 22% of Lithuania's energy demand. Thermal energy plants and the chemical industry are the largest users of natural gas. The government is considering construction of a gas storage facility to maintain reserves. High-voltage (330kv and higher) overhead lines interconnect Lithuania's energy systems, which operates synchronously with the IPS/UPS electricity grid, which includes the power systems of nearly all the countries of the former Soviet Union, including Latvia, Estonia, Russia, and Belarus. Lithuania's National Energy Strategy (NES), adopted in 2007, calls for Lithuania to synchronize its electricity grid with Western Europe's UCTE grid by 2015. The NES also calls for high-voltage links with Poland and Sweden by 2012. The Baltic's' first electricity connection with the Western European grid, between Estonia and Finland, began operation in December 2006. All three Baltic States and Poland have agreed to cooperate in constructing a new nuclear power plant on the site of the current plant at Ignalina, a project which could cost between $6-8 billion.

Opportunities

Potential opportunities in the Lithuanian power-generation sector for both U.S. power-generation technology and service companies include the following:

- restructuring and privatization of the state-owned power generation companies (modernization of the existing plants, process control, environmental issues);
- decommissioning of the Ignalina Nuclear Power Plant's two reactors;
- construction of a new nuclear power plant;
- construction of electric power lines to Poland and Sweden;
- expansion and modernization of the gas distribution network;
- construction of natural gas storage facilities;
- development of renewable energy sources;
- construction of nuclear waste storage.

Resources

- Lithuanian Ministry of Economy: http://www.ukmin.lt
- Lithuanian Development Agency: http://businesslithuania.com
- Lithuanian Energy Institute: http://www.lei.lt/index.php?k=9

MACEDONIA

Changes in the Macedonian energy market are largely shaped by the liberalization of the energy market, regional cooperation and the restructuring of energy production. Since 1994, electricity consumption in Macedonia has grown by an average of 3% annually. It is expected that electricity consumption will continue to rise, due to increased use by households and industry and services sector users. In April 2006, Macedonia's state owned electric power distribution company – ESM(Elektrostopanstvo na Makedonija) was acquired by the Austrian utility company EVN, for over 200 million euros, with an obligation for ESM to invest an additional 96 million euros in the following 3 years.

Following are key figures for ESM – EVN Macedonia for 2006:

- customers: approx. 720,000
- supply: 4,618 GWh
- electricity lines: appr. 24,000 km
- employees: 3,531
- sales revenues: EURO 215 mil.
- total assets: EURO 205 mil.

The electric power production system in Macedonia consists of three thermal power plants with a total of 1010 MW installed capacity and six hydro power plants with 434MW installed capacity. There are two open pitch lignite mines with a total capacity of 7million t/year. The total annual production of electricity in the country is approximately6,400 GWh, which satisfies about 75% of the total domestic energy needs. Macedonia is a full member of the Union for the Coordination of Production and Transmission of Electricity European Interconnection (UCPTE), which ensures interconnect compatibility with European electric power systems. An oil pipeline with a capacity of 2.5 million tons per year connects oil storage facilities at the port of Thessaloniki with Skopje's OKTA refinery. The OKTA refinery, which was originally created to meet the needs of all of southern Yugoslavia, has the capacity to meet not only the country's needs of approximately 1 million tons of refined products per year, but to export refined products to neighboring areas as well. OKTA has plans for construction of a pipeline from Macedonia to Kosovo and Serbia.

In addition to the Skopje-Thessaloniki pipeline, which follows European Transport Corridor 10, the U.S. consortium AMBO (Albanian-Macedonian-Bulgarian-Oil) has proposed a pipeline that would follow the east-west Corridor 8 route, linking the port of Burgas, on the Black Sea coast of Bulgaria, with the port of Vlore, on the Adriatic coast of Albania. The pipeline would transport oil from the Caspian region to markets in Western Europe and the United States. If this project is implemented, there could be substantial export and subcontracting opportunities for U.S. companies.

A natural gas transportation pipeline has been constructed to carry Russian gas from the Bulgarian border to Skopje. This pipeline currently supplies primarily industrial users, but several pilot projects are planned to promote the gasification of urban areas. The government has also discussed the possibility of extending the pipeline to other Macedonian cities.

Opportunities
Following the privatization of ESM – Distribution, the Government has liberalized part of the electricity generation market. The Government is offering concessions for investment in hydropower facilities and other new energy generation opportunities. [Note: at the time of the drafting of this report the Parliament was considering proposed amendments to the energy law.] There are also opportunities to promote more efficient use of electricity, through home insulation and installation of more efficient heaters and electromechanical devices. Also, liberal legislation provides opportunities for small projects and Individual Power Plant (IPP) construction and operation.

MEXICO

This sector includes the sub-sectors of Oil and Gas (OGM), Electric Power Systems (ELP), and Renewal Energy Equipment and Services. With the start of a new administration and the publication of the National Infrastructure Program 2007-2012, the mentioned sub-sectors have been identified to be a priority for Mexico's Federal Government. The demand for imported equipment and services for the energy sector increased by 8% from 2006 to 2007. U.S. exports to Mexico also have grown at an average of 8.5% during the same period. The total market grew at an average of 5.0%annually from 2006 to 2007. The competition will continue to come from Japanese, French, Chinese, Taiwanese, German, and Canadian companies. Mexico's Energy sector will continue to be a priority during the period 2007-2012,therefore, large budgets are expected to be assigned to each of the three major government agencies responsible for the maintenance and investment of energy infrastructure. Government Owned-Petroleum Company (PEMEX), the Federal Electricity Commission (CFE) and Luz y Fuerza del Centro (the federally

owned Mexico City power company) have been authorized by the Mexican Congress a total budget of over $35 billion during 2008.

Best Products/Services

- Drilling of work-over-rigs, to be used in the exploration, discovery, development, maintenance, testing, depletion or production of oil and natural gas wells.
- Pipe; valves; pumps.
- Electrical apparatus for switching.
- Insulated wire cable.
- Electric capacitors, board panels.
- Electric transformers.
- Electric motors and generators.
- Turbines, solar panels, electric poles, hydroelectric plants equipment, static converters.
- Rotary converters.

Opportunities

In 2008 based in the National Infrastructure Program, Pemex, CFE and Luz y Fuerzaplan to announce domestic and international tenders for drilling of new wells in Cantarell, State of Campeche; Chicontepec, State of Veracruz; Burgos, (State of Tamualipas); Ku-Maloop Zaap, and the construction of more that 8,000 kilometers of oil and gas pipelines, the modernization of the Salina Cruz Refinery; construction of the Manzanillo LNG plant; deep water exploration services contracts; mini-hydraulic projects in the South of Mexico; wind to energy projects and geothermal; etching 2008 Pemex plans to publish international tenders for 30wells in the Cantarell area;500 wells in the Chicontepec area; 300 in the Burgos area; 40 wells in the Ku-Maloob-Zaap area; a new marine terminal in Tuxpan (State of Veracruz); construction of 10 new plants for clean oil refined products, etc. With regards to CFE, international tenders are expected for La Yesca hydroelectric plant; La Parota Hydroelectric plant; Guadalajara Iand II combined cycle power plants.

Resources

- Francisco Ceron, Senior Commercial Specialist (Energy)
  Commercial Service
  U.S. Embassy in Mexico City
  Francisco.ceron@mail.doc.gov
- Arturo Dessommes, Commercial Specialist (Electric Power)
  Commercial Service
  U.S. Embassy in Mexico City
  Arturo.dessommes@mail.doc.gov
- Secretary of Energy: http://www.energia.gob.mx
- Secretary of Economy: http://www.economia.gob.mx
- Government-Owned Petroleum Company-PEMEX: http://www.pemex.gob.mx
- Federal Electricity Commission: http://www.cfe.gob.mx
- Energy Regulatory Commission: http://www.cre.gob.mx
- National Energy Savings Commission: http://www.conae.gob.mx
- Central Light and Power Company: http://www.lfc.gob.mx
- College of Petroleum Engineers of Mexico: http://www.cipm.org.mx
- National Infrastructure Plan: http://www.infraestructura.gob.mx
- National Bank for Imports and Exports: http://www.bancomext.com

NEW ZELAND

New Zealand's international competitiveness and economic growth is extremely reliant on an efficient, affordable, and reliable energy sector. Although New Zealand is self-sufficient in all energy forms except for oil – imported oil represents over 80% of the country's total energy supply (Source: Ministry of Economic Development). To prevent New Zealand's increasing dependence on imported fuel, the Government has introduced legislation to attract oil and gas exploration companies. New gas supplies are important for electricity generation particularly as New Zealand's largest gas reserve (Maui) will be exhausted by 2009. Companies specializing in oil and gas exploration are successfully contracting for geothermal well drilling for electricity generation companies. It is estimated that New Zealand will need to install between 150 and 300 megawatts (MW) of new capacity between 2005 and 2030.

In November 2007 the Government launched the New Zealand Energy Strategy. The Energy Strategy sets a target of generating 90% of New Zealand's electricity from renewable energy sources by 2025. Renewable energy has always been a major part of the country's total primary energy supply particularly for electricity generation focusing on hydro, geothermal and wind. Solar and tidal energy are under-developed but due to R&D grants offered by the Government have good potential. In December 2007, Contact Energy (generator of 30% of this country's electricity) received approval to construct a $375 million geothermal power station due to be operational by 2011. The Government's high level of interest in this sector has revealed that New Zealand uses energy inefficiently. The Government is encouraging more efficient energy use by consumers, including more energy-efficient products. The Government's energy policy initiatives are stimulating the sector. Timing is excellent for U.S. companies specializing in this sector.

Best Products/Services

- Transpower NZ Ltd. - national grid upgrades
- Renewable energy technologies including solar and tidal energy
- Oil and gas supplies

Resources

- Energy Efficiency and Conservation Authority: http://www.eeca.govt.nz
- Ministry of Economic Development: http://www.med.govt.nz
- Statistics New Zealand: http://www.statistics.govt.nz
- Transpower NZ Ltd.: http://www.transpower.govt.nz

NORWAY

Norway and its Nordic neighbors are considered world leaders in the use of renewable energy, clean technology and alternative fuels. The governments are inclined to invest in energy research, providing tax benefits, funded expansion plans, electricity certificate programs and production incentives for the increased use of alternative fuels and renewable energy.
Norway has accepted a number of international commitments to reduce emissions(including carbon dioxide, such as the Kyoto Protocol). These numerous commitments have proven to be a challenge for Norway, given its role as the world's fifth largest exporter of oil and the third largest exporter of natural gas. However, in a political agreement in January 2008 between the Norwegian Government and the opposition parties in the Norwegian Parliament the following ambitious climate change goals were stated:

- Norway intends to cut the global emissions equivalent to 100% of its own emissions by 2030, aspiring to become a carbon neutral nation.

- By 2020, Norway plans to reduce global greenhouse gas emissions by the equivalent of 30% of its own 1990 emissions.
- Norway will strengthen its Kyoto commitments by 10%age points, corresponding to nine% below the country's 1990-level.

Norway has a higher share of renewable electricity than any of the EU member states, and the Ministry of Petroleum and Energy indicated a domestic target of 90% renewable electricity by 2010. This calls for significant renewable electricity production increases. Norway has the world's largest per capita hydropower production, and is the world's sixth largest hydropower producer. In a year with normal precipitation, hydropower generation is around 120 TWh, corresponding to approximately 99% of Norway's total power production. Norway considers itself a global environmental champion and is on the leading edge of several clean energy technologies, especially concerning carbon capture and storage(CCS). Production of power and other use of fossil energy are the largest sources of greenhouse gas emissions. Capture of CO2 and storage of CO2 in oil/gas reservoirs and geological formations emerge as potential measures to reduce global emissions. Norway aims to make full-scale CCS a reality.

The Norwegian Government's CCS goals are ambitious. The commitment to develop gas-fired power stations with CCS in Norway is a centerpiece of Norway's energy policy. If successful, Norway will achieve a more secure energy supply and through technology development contribute to reductions in greenhouse gas emissions. The Government has also set a long-term collective goal of 30 TWh of increased renewable energy production and energy efficiency from 2001 to 2016. There inconsiderable interest in building wind power stations, and there are a number of smaller hydropower projects ready for development. This commitment is good news for the growing number of firms creating cutting-edge technology in the areas of hydrogen, solar, wind, tidal and osmotic power, as well as biofuels. Developing and marketing these products will demand a coordinated approach and attention from both the public and private sector. Hydropower – Norway has considerable hydro resources and has over the past 100years constructed more than 330 dams. There are still new niche developments and technology potential associated with hydropower.

Wind power (onshore and offshore) is the renewable energy source where most investments refocused and which is also the source closest to commercial viability(incl. Statoil Hydro, Sway). Solar power is one of the fastest-growing sectors of the global energy market. Norway has ambitions and several leading solar technology companies (including REC Group, Elkem and Norsun) participating in developments across the entire value chain. Tidal power and wave energy are also raising developments - based largely on Norway´soffshore capabilities, with current projects also involving osmotic power (salinity gradient energy based on seawater).Geothermal energy is another renewable energy source, also tied to Norway's oil and gas production expertise.

Opportunities

There are a number of Government-funded programs for renewable and environmentally friendly energy. Some of these programs manage government funding for the testing and demonstration of technology for removing greenhouse gas emissions from power production. As a major producer of fossil fuels Norway considers that it has an important role in contributing to technology development. To develop the technologies necessary to meet the twin challenges of energy security and climate security, the Norwegian Government believes that it must use a mix of political incentives/ persuasion and market mechanisms. In 2007, Norway embarked on a major new research, development and demonstration project with a view to building the world's largest full-scale CCS facility in connection with a combined gas-fired heat and power plant at Mongstad.The plant, located on Norway's west coast, is projected to be fully operational by 2014.

This is cooperative venture between the Norwegian Government and the oil and gas company StatoilHydro.

The Norwegian Government expects the Mongstad project to stimulate international technological cooperation, which it considers critical for coherent, urgent and broad-based action on climate change. It should be noted that the funding model of the project caused problems with regard to regulatory approval from the European Union. Nevertheless, the government has pledged to go forward with Mongstad.The Norwegian Government has decided that all new gas fired power plants shall be based on CCS technologies. The government strategy to achieve this goal involves combination of technologies and processes, financial support and regulations. Gas nova, a government entity, was established in July 2007 with the mandate to manage governmental interest and support technology development within the area of CCS management.

The Norwegian Government has also allocated $3.3 billion (NOK 20 billion) for a fund set up to strengthen efforts on renewable energy and energy efficiency. The state owned agency Enova will manages the yield from the fund. Enova will establish a support system for district heating infrastructure, and manage a support system for renewable electricity.

Resources

- Norwegian Ministry of Trade and Industry http://www.regjeringen.no/en/ministries/nhd.html?id=709
- Norwegian Ministry of Petroleum and Energy http://www.regjeringen.no/en/ministries/oed.html?id=750
- Norwegian Ministry of Environment http://www.regjeringen.no/en/dep/md.html?id=668
- Norwegian Pollution Control Authority www.sft.no
- Gassnova http://www.gassnova.no
- Enova www.enova.no
- Norwegian Water Resources and Energy Directorate http://www.nve.no

PANAMA

Panama's demand for electricity is growing by approximately 50 MW per year. In 1997the national electric utility was split into a number of companies dealing with generation, transmission and distribution of electricity. Roughly, 50% of these companies were sold to the private sector and two% to the Labor Union. The government only retained full control of the transmission company. The Panamanian market is very receptive to U.S. electrical power equipment. Its high quality, durability, competitive prices, quick delivery and service capability, are the main factors behind this preference. Price and quality are the main factors in selecting equipment suppliers, followed by after sale service, which includes technical assistance. Competitors come principally from Sweden, Italy, Brazil, Germany and England. Panama has no particular standards and regulations for power generation equipment. All U.S. made equipment is readily accepted in Panama.

Best Products/Services

The market offers excellent opportunities for both hydroelectric generators, especially small and medium size plants, and thermo electric generators.

Opportunities

The Government of Panama passed Law No. 45 of August 4, 2004 to provide a number of incentives for the construction and development of new electric generation plants, especially hydroelectric plants (up to 20 MW) and other clean energy sources.

Resources

- Electric Regulatory entity: http://www.asep.gob.pa
- Government Scientific/Technology Organization: http://www.senacyt.gob.pa
- CS Trade Specialist: Enrique.Tellez@mail.doc.gov

PHILIPPINES

The implementation of the 2001 Electric Power Industry Reform Act (EPIRA) appears tube gaining momentum, as noted by recent consecutive successes privatizing assets previously owned by the National Power Corporation (NPC). As of December 2007, the Philippine government reports that it has sold 43% of the total generating assets up forbid. In 2007, three major assets were privatized, including the 600 MW Massillon coal plant (won by a consortium that included U.S. energy firm, AES), a hydropower complex(awarded to a Filipino-Norwegian consortium), and another major coal power asset(whose winning bidder included Belgian firm Suez-Tractable). Before 2007 ended, consortium of Filipino and Chinese partners won the bid to operate the country's transmission infrastructure under a 25-year concession agreement.

The entry of these new players in both power generation and transmission segments reflects the growing confidence in establishing a more dynamic and competitive energy sector. Likewise, recent efforts to achieve energy self-sufficiency appear to be a step in the right direction towards realizing more affordable power rates and reducing dependence on imported fuels. Meanwhile, demand for power continues to surge, and will require additional capacities in the main grid areas (i.e., Luzon, Visayas and Mindanao) while old power plants are being retired or decommissioned. According to the Philippine Department of Energy's(DOE) Philippine Energy Plan (2005 – 2014),demand for electricity will grow annually at an average of 7% to 9%. The expected increase in energy use is fueled by increased economic activity, notably in such industries as mining, semiconductors, and building and construction (notably in the public infrastructure, commercial and residential segments).DOE projects P227 billion (approx. $5.5 billion) worth of investments are required to increase the country's power generating capacity by 2014. As of March 2007, DOE reports that private sector proponents have already committed 22% of the total investment requirements. To drum up interest, the government is offering various fiscal and other investment incentives to power sector investors.

Electrification in the rural areas is almost complete. As of September 2007, the government's electrification program in the rural communities stood at 95.8%, mainly through public-private partnerships. The government is targeting 100% electrification by2010.Industry insiders note that in the last couple of years, the market has become more price-sensitive, as there is a growing preference among end-users for lower-priced yet technically compliant options.

Best Products/Services

- ¸ Kilowatt-hour (kWh) meters and related electronic metering equipment
- ¸ Circuit Breakers
- ¸ Transformers
- ¸ Protection Devices (e.g., lightning arresters, reclosers, switch gears, voltage regulators)
- ¸ Lighting Equipment
- ¸ Energy Efficiency Technologies
- ¸ Connectors
- ¸ Pole Line, Transmission and Distribution Hardware
- ¸ Wires and Cables
- ¸ Stand-by Mobile Power Generating Systems

Opportunities

- . Expansion, upgrade or rehabilitation of existing power plants to augment existing capacities and avert threats of a power shortage in the next few years, particularly in the Mindanao grid.
- The power generating companies (GenCos), including new entrants, are in different stages of expansion, rehabilitation, upgrade and/or regular maintenance work which presents a range of opportunities for the supply of various types of equipment and services.
- The Transmission Development Plan (TDP) being implemented by TransCo is still under way. Initiated in 2005, the $850 million, 10-year project involves planned expenditures for additional transmission and substation capacity, inter-grid linkages and the continuous repair and upgrade of existing transmission infrastructure. The Japan Bank for International Cooperation (JBIC) has been identified as one of the main funding sources for this project.
- Increase in demand from local electric power cooperatives requires an enhancement of their distribution capacities. Their main concern remains the reduction in systems losses.
- Additional power demand will come from increased industrial activity, particularly mining-related activities, which are enjoying renewed investment interest.

Remote, off-grid areas being addressed by the government's rural electrification program, which includes tapping new and renewable energy sources. This includes the supply of electricity to isolated and underserved areas under the Small Public Utilities Groups (SPUG) currently managed by the NPC. Meanwhile, opportunities for the supply of stand-by power generating facilities are still seen as a stopgap measure to arrest recurring power outages in certain vulnerable islands.

Resources

- Department of Energy (DOE): http://www.doe.gov.ph
- Energy Regulatory Commission (ERC): http://www.erc.gov.ph
- National Electrification Administration (NEA): http://www.nea.gov.ph
- National Power Corporation (NPC): http://www.napocor.gov.ph
- National Transmission Corporation (TransCo): http://www.transco.ph
- Power Sector Assets & Liabilities Management (PSALM) Corp.: http://www.psalm.gov.ph
- Wholesale Electricity Spot Market (WESM): http://www.wesm.ph
- Edu Niala, Commercial Specialist, U.S. Commercial Service Manila
  Email: Edu.Niala@mail.doc.gov, Manila.Office.Box@mail.doc.gov

PORTUGAL

The Government of Portugal (GOP) over the last couple of years has approved various measures to promote, develop and achieve one of the most ambitious renewable energy(RE) goals among the 27-member European Union countries. Current proposed targets are for 39% to 45% of electricity to be produced from RE by 2010. Portugal turned to RE to reduce its huge dependence on imported fossil-based fuels – over 87% - and meet its international commitments to reduce carbon dioxide emissions. The objectives defined by the GOP include the following:

- Increase installed wind power capacity to a total of 5100MW by 2012;
- Achieve 250MW in biomass installed capacity by 2010;
- Reach a target of 10% of bio-fuels integrated into road fuels by 2010;
- Achieve 100MW of biogas installed capacity for anaerobic waste processing;

- Actively promote micro generation and reach a total of 50,000 installed systems by 2010;
- Create a pilot zone capable of reaching 250MW capacity for technological development of new wave energy prototypes.

The RE industry includes companies that operate as developers, equipment manufacturers, operators, utility and maintenance service providers. Some companies are active in more than one area and may develop, operate and maintain sites. U.S. firms should enter the Portuguese market with partnerships, services and equipment supply.

Best Products/Services
Given the GOP's commitment to accomplishing the above-mentioned goals, demand for RE products and services in Portugal is expected to grow. U.S. suppliers of RE products will find significant sales opportunities in wind turbines, wind cables and conduits, wind coatings and composite materials, photovoltaic modules, power inverters, alternative fuel conversion systems and dispensers, vegetable and algae oil extraction technology, energy efficiency products, biomass technology including waste to energy and micro generation equipments. There is also a strong interest in RE services in the areas of project development, maintenance and finance.

Opportunities
U.S. technology and equipment providers, consultants, service providers and other Re advocates are encouraged to touch base with the different RE-focused groups and institutions to explore areas for collaboration. This industry is very receptive to advances in technology, which present opportunities for entry via a collaborative research or partnering approach with a local company. Obtaining up-to-date information on market dynamics is very important, given the fast developing nature of the industry and the continuing introduction of new technologies.

Resources
- Direcção Geral de Geologia e Energia – DGGE http://www.dgge.pt
- Adene – Agencia para a Energia http://www.adene.pt
- REN – Rede Electrica Nacional, SA http://www.ren.pt

ROMANIA

According to the Ministry of Economy and Finance, the total investments in the energy sector, including the renewable one, will raise up to $45 billion by 2020. The European Union has earmarked $405 million for energy efficiency projects in Romania, out of which $180 million are allotted to renewable energy projects over the period 2007-2013. TERMOELECTRICA SA is the main Romanian power and heat producer. Thermal power generation is based on fossil fuels: lignite, hard coal, natural gas and liquid fuel. Termoelectrica is a joint-stock commercial company, state-owned, and under the authority of the Ministry of Economy and Finance.

The company, with a total installed capacity (by December 31st, 2005) of 5520 MW, includes the following subsidiaries:

- Electrocentrale Bucuresti S.A. (2008 MW)
- Electrocentrale Deva S.A. (1260 MW)
- Electrocentrale Galati S.A. (535 MW).

The company also has 4 branches for electricity and heat generation, 1 branch for assets evaluation and 12 maintenance centers with each its own legal entity.

TURCENI SA, ROVINARI SA, CRAIOVA SA are the main coal-fed thermal power energy complexes. Mining exploitation was affected by the 2004 reorganization and reengineering of the power generation lignite-based sector. HIDROELECTRICA SA is responsible for hydropower production, managing 350 hydropower plants and pumping stations with an installed capacity of 6,260 MW and with power generation in an average year of 17,298 GWh.

NUCLEARELECTRICA SA is responsible for nuclear power generation and nuclear fuel production and is the state-owned operator of the Cernavoda nuclear power complex. Cernavoda has a gross output of 706 MW. A consortium of Atomic Energy of Canada and Ansaldo of Italy, incorporating some American equipment, built the first unit, Cernavoda 1, a CANDU reactor with a capacity of 750 MW. Unit 2 became operational as of October 2007 and Cernavoda 1&2 now account for about 18% of electricity production in Romania.

TRANSELECTRICA SA, the electricity transmission company, has 8 transmission stations. Transelectrica is responsible for safe and efficient operation of the power system and the wholesale electricity market. ELECTRICA SA, with 8 subsidiaries and 858 substations, is responsible for power distribution. The company has a portfolio of clients of about 8.5 million, out of which 7.9 million households and 0.6 million companies.

Best Products/Services
Major rehabilitation and privatization programs of the Romanian energy sector scheduled to take place over the next years will lead to increased exports thereby stimulating the demand for increased energy products and services. The Best Products for U.S. companies are exports of electrical power systems and activities related to energy network design and construction, operation (including transportation, transmission and distribution), maintenance and repair, installation and upgrading, wholesale customer activities (metering and billing, energy management), trading, brokering and sales activities, commodity and risk management, advisory activities, research and development, and bio fuel technologies.

Opportunities
Major rehabilitation and privatization programs of the Romanian energy sector scheduled to take place over the next years will lead to increased exports thereby stimulating the demand for increased energy products and services. The Best Products for U.S. companies are exports of electrical power systems and activities related to energy network design and construction, operation (including transportation, transmission and distribution), maintenance and repair, installation and upgrading, wholesale customer activities (metering and billing, energy management), trading, brokering and sales activities, commodity and risk management, advisory activities, research and development, and bio fuel technologies.

Based on the objective of fully liberalizing the energy market during the next few years, several important developments have taken place in this sector such as the implementation of a deregulation process - based on the need of setting more market principles and free competition - as well as by promoting a sustained privatization and modernization process.

TERMOELECTRICA SA. According to the Romanian Government, “2008 has to be the privatization year for thermal power plants, or else some of them will have to be closed by 2010-2012 due to environmental non-compliance”. The Romanian Government has decided to privatize the Craiova energy complex but it is pondering which of the Turceni and Rovinari complexes to include in the planned integrated state-owned power producer. In the case of the Braila, Doicesti and Borzesti power plants, the GOR has been opted for joint ventures where the state-owned companies would contribute their assets and the private investors would bring the cash. The Mintia and Paroseni power plants will remain state-owned for now.

HIDROELECTRICA SA. State owned electricity producer Hidroelectrica will hold three public tenders in February 2008, aimed at selling 16 micro hydropower plants, in batches, for a total amount of RON 24.29 million (EUR 6.9 M). Hidroelectrica intended to sell these 16 units since late 2006. The state-owned electric power producer also announced that during 2007-2008, it would sell over 100 micro hydropower units, having sold 48 such plants between 2004 and 2006.

NUCLEARELECTRICA SA. In 2007, Nuclearelectrica launched an international tender for building Units 3 and 4 of the Cernavoda nuclear power plant. Currently, the operator is negotiating with 6 selected investors that submitted binding offers: Electrabel Belgium, Enel Italy, Iberdola Spain, CEZ from the Czech Republic, Arcelor-Mittal from Romania and RWE from Germany. The commissioning of Units 3 and 4 is expected for 2014 and respectively for 2015.

ELECTRICA SA. Privatization of the eight Electrica subsidiaries is estimated to yield more than $1 billion. The first two, Banat and Dobrogea, were privatized in July 2004, followed by Oltenia and Moldova in 2005. In 2006, Enel SpA, Italy's biggest electricity utility, won the bid to acquire a majority stake in Romania's most profitable power distributor, Electrica Muntenia Sud SA, for $1.06 billion. In 2008, the Romanian government is to embark upon the sale of another three distribution companies Transilvania Nord, Transilvania Sud and Muntenia Nord. No timeline has been announced.

RENEWABLE ENERGY There are solid expectations that, over the next few years, Romania may become the main exporter of “green fuel” in Europe, with the Portuguese from Martifier, Germans from Ferrostaal, Argus Constanta and Rompetrol Group investing a total amount that exceeds 235 million Euros in the Romanian production of bio-diesel. According to the Ministry of Economy and Finance and the Ministry of Agriculture, in 2008, Romania will see a boom in its bio-diesel production. Based on experts’ opinions, the Romanian bio-diesel production is estimated to be 400 thousand tones until 2008, mainly resulting from sunflower and from oilseed rape.

Resources

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- Ministry of Economy and Finance: http://www.minind.ro
- TERMOELECTRICA SA: http://www.termoelectrica.ro
- HIDROELECTRICA SA: http://www.hidroelectrica.ro
- NUCLEARELECTRICA SA: http://www.nuclearelectrica.ro
- TRANSELECTRICA SA: http://www.transelectrica.ro
- EELECTRICA SA: http://www.electrica.ro
- Romanian Government: http://www.guv.ro

SAUDI ARABIA

Saudi Arabia faces a major challenge in meeting the electricity needs of its burgeoning population over the next 20 years. Consumption is growing at an annual rate of 6percent requiring an estimated $119 billion in direct capital investment by the year 2020.The Saudi Government (SAG) seeks private investment to expand generation capacity, unify its national electricity grid, and switch its power plants from heavy oil to natural gas. The SAG also needs development in the transmission sector. Brown outs are common in the Western and Southern Provinces of Saudi Arabia due to insufficient capacity. On November 2002, the Supreme Economic Council created a regulatory body to set prices and encourage foreign investment in the sector. Since then, various

projects have already been launched including upgrading existing power plants and building new facilities.

To encourage private sector investment in power generation, the Saudi government issued a decree in 1997 redefining power generation as an industrial activity, which brought power generation under the authority of the foreign investment code allowing both domestic and foreign investors to freely invest in power generation. In 2003, the transmission and distribution sectors were opened to foreign and local investors, and theater and electricity operations were brought under the authority of a single ministry, the Ministry of Water & Electricity (MOW).
To ensure that the interest of private investors, electricity operators, and consumers are protected, the Saudi Government established an independent regulatory body, the Electricity and Co-Generation Regulatory Authority (ECRA). A new Electricity law was passed in November 2005. While its details have not yet been published, the new law is expected to reorganize the electricity sector and define the roles of the Ministry of Water and Electricity, the private sector, and the Saudi Electricity Company (SEC).

Best Products/Services

- Gas turbine units
- Steam turbine units
- Turbine spare parts & accessories
- Power plant design engineering firms
- Power plant consulting firms
- Products and services related to the power industries:
  - Valves,
  - Compressors
  - Pumps
  - Spare parts
  - Other related equipment and products.

Opportunities

Projects to be undertaken by the Saudi Electricity Company (SEC) in Saudi Arabia:

- Muzahimiyah Power Plant - 1,725 MW
- Salboukh Power Plant - 1,725 MW
- Power Plant # 10 (PP-10) – 2,500 MW
- Yanbu-II Power Plant - 3,600 MW
- Riyadh Power Plant-7 Expansion - 500 MW
- Qasim Power Plant Expansion - 360 MW
- Al-Khafgi Power Plant - 200 MW
- Jubail Phase 2 – 1500-2000 MW
- Riyadh Power Palnt 11 – 2200 MW
- Tabouk – 220 MW
- Najran – 110 MW
- Juba – 110 MW
- SADAF – 190 MW
- Aramco Manifa – 250 MW

-

The following is a list of future power projects to be undertaken by the Water and Electricity Company (WEC) in Saudi Arabia:

- **Shuqaiq, Phase II** - $2.5 billion BOO project to produce 850 MW of electricity and 212 million cubic meters of desalinated water per day. Shuqaiq II will be modeled after the

Shuaiba III IWPP project, with similar guarantees and a 20-year power and water purchase agreement (PWPA).

- **Ras Azzour** - $2.4 billion project to produce 2,500 MW of power and 176 million gallons of desalinated water per day.
- **Jubail, Phase III** – The project will produce 1,100 MW of electricity and 25,000gallons of desalinated water per day.

Private investment in the power sector is also a key component of the development plan of the two major industrial cities of Jubail and Yanbu. In the summer of 1999, the Saudi government officially approved the creation of the join-stock Water & Electricity Utility Company named (MARAFEQ). On December 20, 2006, MARAFEQ signed a contact with Suez Energy International to develop on a BOOT (build, own, operate, transfer)basis and will be located in Jubail. MARAFIQ IWPP plant consists of a Combined Cycle Gas Turbine plant with a capacity of approximately 2,750MW, and 800,000 cubic meters water per day. The project will deliver electricity and water to MARAFIQ under twenty-year Power and water Purchase Agreement (PWPA) commencing on April 1,2010. The first phase of the project will deliver 660 MW and 300,000 cubic meters per day starting in summer 2009, with full capacity being achieved in March 2010.Private sector investment is emerging as a key component in the upgrading and expansion of Saudi Arabia's electricity infrastructure. The concept of Independent Power Projects (IPP) is also gaining ground among Saudi Arabia's leading companies, including Saudi Aramco, SABIC, and Ma'aden, which are contracting local and international private companies to build power plants for their mega projects:

Rabigh: In August 2005, a Japanese consortium was awarded a $1.1 billion contract to build a co-generation and desalination plant for the Rabigh integrated petrochemical and refining complex jointly owned by Aramco and Sumitomo Chemical. The project, which stipulates a 25-year water and energy conversion agreement (WECA), is expected to come on stream by 2008.

Ma'aden: Local and international contractors are preparing for the release of invitation to bid (ITB)documents on the Ras Azour power and desalination plant, planned by Saudi Arabian Mining Company (Ma'aden). The tender, together with the pre-qualification shortlist, will be issued on 15 August 2006. The co-generation plant will have power capacity of 160MW and 10,000 cubic meters a day of desalinated water, using multi-effect distillation(MED) technology. The company is also planning a separate, larger co-generation facility for its multi-billion-dollar aluminum refinery and smelter complex, also located at Ras Azour. The contract to build the 1,800 MW plant is to be tendered in August 2008.

Resources

- Ministry of Water & Electricity ((MOW) http://www.mow.gov.sa
- Saudi Electricity Company (SEC) http://www.se.com.sa
- Saline Water Conversion Corporation (SWCC) www.swcc.gov.sa
- Water & Electricity Co. (WEC) www.wec.co.sa
- Royal Commission for Jubail and Yanbu www.royalcommission.com
- Saudi Aramco www.saudiaramco.com.sa
- Power and Water Utility Company For Jubail and Yanbu - MARAFIQ http://www.marafiq.com.sa
- Saudi Arabian Mining Company (Ma'aden) http://www.maaden.com.sa
- Electricity & Co-Generation Regulatory Authority (ECRA) http://www.ecra.gov.sa

SENEGAL

Following institutional reform in 1998, Senegal's electricity sector was split into three entities: Senelec, the national utility, the Agency for Rural Electrification(ASER) and the Electricity Regulatory Board. Senelec holds the monopoly for transmission and distribution of electricity. Electricity generation, mainly on a Build-Own-Operate (BOO) basis, is open to with independent power producers (IPPs). The General Electric/GTI Dakar IPP, which supplies approximately 20% of Senelec's electrical needs, was commissioned in 1998. It has an installed capacity of 56 MW. On-line since January 2008, the second IPP Kounoune 1 – 67.5 MW - was partially funded by the International Finance Corporation., with Mitsubishi and Matelec S.A.L, a division of the Doumet group from Lebanon, as strategic partners. Senegal's major source of electricity is mostly diesel and gas, with an installed capacity of633 MW. Some hydroelectricity generated from the Manantali Dam in Mali is split between Senegal, Mali and Mauritania. Manantali has an installed capacity of 200 MW dispatched as follows: 52% for Mali, 15% for Mauritania and 33% for Senegal (66MW). Senegal is committed to shifting from a diesel-based power generation to cheaper energy sources. Senegal has thus put and option on the coal technology. The recent bid to Build-Own and Operate a 125 MW coal-fired plant was awarded to a consortium of companies headed by the Swedish operator Nykomb Synergetics .

Senelec is dealing with a chronic production gap, which has worsened due to an increased demand – the average demand increase during 2005-2009 is estimated at 7%, representing an electricity consumption of 1,933 Gigawatthours in 2005 to an estimated 2,660 Giga watt hours in 2009. Senelec is experiencing declining reliability of aging power plants. Senegal's GDP growth was hindered in 2007 by frequent electricity outages, which caused a slowdown of the economic and manufacturing activities. The GDP growth rate decreased to 2.1% in 2006 from 5.5% in 2005. According to local reports, the outages have contributed to the closure of many small and medium-sized enterprises (SMEs) in the food processing, textile and tourism sectors. Larger companies are reporting declines in output averaging 30%. Senegal has embarked on an aggressive effort to produce significant quantities of biofuels, initially to run electricity generation units, and has a pilot project using sugarcane-based ethanol.

Best Products/Services

- Utility vehicles and generators
- Refinery of biofuel products.

Opportunities

Senegal's long-term needs for more electricity, upgraded power plants and increased levels of rural electrification are still unmet. Opportunities exist in the replacement of Senelec's obsolete generating capacity through IPP, in the upgrading of the interconnected grid, as well as the construction of new transmission lines. The company recently announced investments of CFAF520billion ($1.15 billion) for the period 2008-2015 to correct the perpetual power failures.

The Senegalese Government wants to extend coverage of electricity to rural areas; in conjunction with the World Bank, the Agency for Rural Electrification(ASER), will tender 12 rural concessions for 2007-2010. Concessionaires will be responsible for providing power to rural communities as well as billing and revenue collection.

Senegal is exploring ways of diversifying its electricity generation. The project of building a 250MW coal-fired plant is under discussion with the Chinese. Time will tell if this is a white elephant as many experts have asserted. Senegal has recently signed a Power Purchase Agreement with the Swedish firm NykomgSynergetics involved in the planned construction of a 125 MW coal-fired plant.

OMVS, the Senegal River Development organization – a joint organization between Senegal, Guinea, Mali and Mauritania – has concrete plans to add some generation capacity of 840 GWh in the next few years. All the studies have been carried out.

Resources

- OMVS – www.omvs.org
- Agence Senegalaise d'Electrification Rurale: http://www.aser.sn/
- US Trade and Development Agency: www.ustda.gov
- Electricity Regulatory Board: www.crse.sn
- Senelec: www.senelec.sn

SLOVENIA

The government of Slovenia owns an 80% stake in Holding Slovenske Elektrarne (HSE),the major electricity producer in Slovenia. The government has indicated an interest in partial privatization of HSE and its associated distribution companies in the coming years. The government's vision for the energy sector through 2015, as outlined in its Strategy of Electrical Energy Production, foresees significant investments over the next ten years. Increased hydroelectric power generation is one of the strategic objectives of the government's energy policy. Further upgrading of the upper stations on the Sava Riveris planned as well as construction of a chain of six new plants on the lower Sava. Construction of the first two plants began in 2004; a construction permit for the third one was obtained in November 2005. While final documents for the fourth plant were prepared in the beginning of 2007, construction of the remaining two plants is foreseen in the period between 2008 and 2014. The upgrading of three plants on the Drava Riverwill be completed by 2010. Feasibility studies are underway for additional small run-off river and storage plants and for the exploitation of other renewable energy sources. Together with the new plants, these renovations will create an additional 470 MW of hydroelectric capacity by 2015.

Plans for conventional thermal power (i.e. coal-fired) generation are based on maintaining production at existing plant locations and building facilities at new sites, primarily for combined heat and power generation. Investments will be required to improve pollution controls to meet environmental standards, to increase rapid response and peaking capacity, and for renovation of control systems at existing plants. Construction of a new production block with a 500 MW capacity at Thermal PlantSostanj is planned for 2008 and should begin operation in 2011. The government also foresees construction of two oil-fired facilities, including a 60 MW unit in Sostanj. A second oil-fired plant in Brestanica with a capacity of 143 MW is scheduled for completion by 2011.

Investment plans through 2015 in the transmission and distribution system include the modernization of national dispatching and local distribution control centers, the renovation of the transmission grid, better control of reactive power in the system, and the completion and renovation of the east-west 400 kV transmission lines with connection to Hungary and a 400 kV substation. However, a lack of financial resources has already postponed these priority investment projects for a number of years.

In the past few years, plans have been made to build three wind-operated power plants in the Primorska region, where the Bora wind could produce significant quantities of electrical power. All three plants would consist of 150 wind powered turbines. None of them have been constructed yet as they are still in the process of gaining all necessary approvals (mainly environmental) for the project. The local community (represented by birdwatcher NGO) strongly

opposes the project and uses every possible legal instrument to stall the project. Thus far it has succeeded.

Quick facts about the ENERGY sector:
While the gas and oil market is privatized, the electricity production is still in state hands. Holding Slovenske Elektrarne (HSE) is a large holding owning and managing a series of electricity production plants (predominately hydro power). Even though its privatization has been mentioned several times, no exact plans and time schedules for privatization have been announced recently.
Number of Companies: 130
Number of people employed in sector 12,619
Revenues $6.472 billion (4.4 billion Euros)
Import items:

- Brown coal and lignin,
- oil derivatives,
- liquid gas,
- natural gas,
- electricity

Best Products/Services

- Trade (wholesale) with fuels and lubricants
- Trade (retail) with motor fuels
- Distribution of electricity, gas, heat, and hot water
- Mining

Leading Companies in Sector

Oil:	Petrol, d.d. (www.petrol.si)
	OMV Slovenija (www.omv.si)
Gas:	Geoplin, d.o.o. (www.geoplin.si)
Electricity:	Holding Slovenske Elektrarne, d.o.o. (www.hse.si)
	Eles, d.o.o. (www.eles.si)

SPAIN

Between 1997 and 2007, electricity consumption in Spain increased 65%.Spanish Government officials project that companies will spend Euros 6.5 billion (USD8.5 billion) between 2002-2012 to meet the country's growing energy demand. National electric energy demand grew by 2.7% in 2007. In Spain, historical maximum demand was registered in December 2007. According to Renewable Energy Plan(2005-2010), 12% of energy consumed will be renewable energy. This plan projects a GOS investment of almost Euros 23 billion (more than $31 million) in renewable energy in Spain to reduce energy dependence and increase the safety of supply.

The government also approved the 2005-2007 Action Plans for the Spanish Strategy of Energy Saving and Efficiency Program (2004-2012) that rationalizes energy consumption and complements the effort being put into renewable energy technologies. This plan's objective was to produce 1,150 MW of electricity from cogeneration by the end of 2007. It will produce a cumulative reduction of primary energy of 12,004 tons of oil equivalent (toe), equivalent to 8.4% of total Spanish energy consumption and of20% of oil imports.

Average energy demand in Spain is projected to increase approximately 3.7% per year until 2011. The Spanish Government estimates that by the year 2010, renewable sources will account for 29% of total power generated. Natural gas will account for 33%. The Ministry of Industry

anticipates more than 50% growth in renewable energy consumption from 2000 to 2011. Spain is one of the fastest-growing major industrialized economies, but has very limited domestic energy resources. Eighty% of energy consumption must be met from imported sources. Energy imports to Spain account for 10% of total imports. Spain imports approximately 64% of the coal, 99.5% of the oil and 99.1% of the gas it uses. Oil accounts for 50% of primary energy consumption. As the market becomes increasingly competitive, joint ventures and partnerships will play an important role in capturing market share, injecting necessary capital and technology to ensure continued dynamic growth in the sector.

Liberalization of the power-generation market began with Law 54/1997, which implemented European Commission Directive 92/96 for the internal electric market and initiated deregulation of Spain's power-generation and distribution market. This new law established the freedom to build power generation facilities, created a competitive electricity market, and set a gradual time frame for liberalization, which began January 1,1998. The deregulation process, completed on January 1, 2003, brought major changes to the electricity sector and permitted every consumer to buy electricity freely on the open market.

The challenge Spanish regulators face is balancing the country's energy needs while keeping Spain's carbon-emissions commitments under the Kyoto Protocol. The solution for keeping the lights on in the fifth-largest electricity market in the EU is born of necessity and immensely practical: build natural-gas-burning, high-efficiency, combined cycle plants and significantly increase Spain's wind-power portfolio. Spain's installed wind-power capacity (more than 12,800 MW) makes it the second largest wind-energy producer in the world, after Germany (20,622 MW). Spain's heavy investment in wind technology has brought more than 10,000 MW online, 20% of the world's total by mid-2007, and satisfying more than 10% of Spain's total electricity demand. Another 57,000 MW of wind projects are on the drawing board. Plans called for the installation of an additional 2,400 MW produced by gas combined cycle power plants before end of 2006. Spain leads the EU in growth of natural gas consumption; that growth is projected to continue at a rate of about 10% a year through 2011. Electricity generation from the Special Regime (renewable, cogeneration and waste-to-energy) increased eight% in 2007,mainly due to renewable sources. Nuclear generation decreased 8.6%.

Opportunities

Spain has 81,022 MW installed capacity. The sector is attracting a substantial amount of investment to modernize old plants and move to a new way of doing business. This investment should present opportunities for U.S. companies offering state-of-the-art equipment and services. Renewable energy in Spain represented more than 12% of primary energy production in 2007. Wind energy and hydroelectric power are the main renewable sources. The renewable-energy sector in Spain offers growth opportunities in solar energy and bio-fuels. UNESA, the Spanish utilities association, estimates that energy producers will invest more than three billion Euros (USD 4.1 billion) in renewable energy projects through 2007.

Opportunities exist in the solar-energy market. The new legal framework being developed in Spain encourages the use of devices in buildings and houses that guarantee minimum coverage of power demand by solar energy. This solar energy will reduce pollution and diminish drastically dependence on fossil fuels. The goal for photovoltaic solar energy installation is 3.000 MW by 2010. The solar resource is abundant in Spain as compared to other countries. Electric utilities are the main promoters of renewable-energy projects in Spain, since they possess the resources and technology necessary to develop them. Federal**,** regional and local governments are also very active in renewable energy development and offer incentives to attract investment, which they consider beneficial in economic, political, social and environmental terms.

The challenge of the plans above is to make the renewable-energy sector attractive to private investors, to maintain the interest that has already been created in some sectors, and to expand it to other areas in the energy industry. Business opportunities exist for U.S. firms in the Spanish energy market and strategic alliances with Spanish companies can give U.S. company's access to the Latin-American market as well. U.S. small and medium- sized companies, particularly equipment and service providers, should know that doing business with Spanish energy companies can open up opportunities in other sectors, such as environmental technology that are closely linked with energy.

Resources

- Spanish Ministry of Industry: www.mityc.es
- Comisión Nacional de la Energía (National Energy Commision - Regulator): www.cne.es
- Instituto para la Diversificación y el Ahorro de Energía IDAE: (Institute for Energy
- Diversification and Saving): www.idae.es
- Red Eléctrica de España (Electricity Transmission and Operations): www.ree.es
- Spanish Association of Renewable Energy Producers: www.appa.es
- Spanish Utilities Association: www.unesa.es
- Spanish Energy Sector Web Site: www.energuia.com
- EU Energy Sector Webs: www.europa.eu.int/comm and www.aquieuropa.com
- Information on customs duties: www.taric.es
- Commercial Service Spain: www.buyusa.gov/spain
- Trade Specialist Energy Sector: Carmen Adrada, Carmen.Adrada@mail.doc.gov

SRI LANKA

Sri Lanka's total installed power generation capacity is about 2,437 MW. Installed hydro capacity is around1.319MW, thermal about 1,115 MW, and wind approximately 3MW.Sri Lanka needs more cost-effective power to meet its energy demands, estimated to be growing around 8-10% annually. The country's efforts to increase capacity have been slowed by the lack of a power policy, protests by environmental and social groups, and limited technical capacity within the government to review private power projects, especially in terms of financing packages. The delays have resulted in over 60% of the country's power in 2007 being generated from expensive thermal power plants. According to the Minister of Power & Energy, Sri Lanka plans to add around 3,000 Motto the national grid in the next five years by implementing four coal power plants indifferent parts of the country. The Ministry of Power and Energy commenced construction of the stalled Petaluma coal power project with financing from China. The first phase of this project will add 300MW to the national grid in 2011. The next two phases will add an additional 300MW each. The first phase is estimated to cost $450million. Several other power projects are in the pipeline, including a 150MW hydropower plant under construction and two recently tendered 300MW combined cycle plants. SriLanka also signed an agreement with India's National Power Corporation in 2006 to build a 500MW coal power plant in the east of the island; however, construction has not yet begun. Delays in commencing operations of these plants or a drought in the interim period could result in power shortages, forcing investment in emergency generating capacity.

The private sector currently operates several thermal power plants on a build own operate (BOO) basis. U.S. company AES operates a 165MW plant on BOO terms. Private companies also operate several mini hydro plants. The state-owned electrical utility, the Ceylon Electricity Board (CEB), has backtracked on power purchase agreement commitments and contractual obligations to private plant operators. The CEB is currently running at a financial loss due to inefficiency, heavy dependency on oil, and selling electricity below the cost of supply. Future donor funding to the Cabins contingent upon CEB restructuring, which its labor unions have successfully resisted.

Sri Lanka has yet to strongly promote renewable energy including wind, solar, minihydro and biomass. USAID has assessed wind and solar energy potential for Sri Lanka.This information is available on www.nrel.gov

Resources

- Ceylon Electricity Board www.ceb.lk
- Asian Development Bank www.adb.org/srilanka/projects.asp
- USAID/South Asia Regional Energy Program (SARI) http://www.powersrilanka.com/
- USAID wind and solar maps www.nrel.gov

SWEDEN

The annual energy supply in Sweden amounts to approximately 624 TWh. Fossil fuels, such s oil, natural gas and coal, used by the transportation and refinery sectors, account for almost 32% of the current supply, followed by nuclear power, befouls and hydropower. Renewable energy plays an increasingly important role in the Swedish energy system, and currently contributes almost 29% of the overall energy supply. The main sources for electricity in Sweden are hydropower and nuclear power, accounting for 80% of the supply. The remaining 20% is covered by befouls, wind power, conventional thermal power plants, and a small amount of photovoltaic and geothermal power.

Following the EU directives and regulations, Sweden is concentrating on improving and establishing long-term conditions for wider use of renewable energy resources, including new plant construction, R&D, incentives funding and industry harmonization. The government is committed to work on breaking the dependence on fossil fuels by 2020,and inclined to invest in renewable energy and power generation research and development to enable and alleviate the expanded use of bio-fuels and other renewable energy sources for electricity, heat and transportation. As noted in the overview, Embassy Stockholm, in line with U.S. policy to break dependencies on oil and combat Global Warming, has put the highest priorities on activities in this sector.

Best Products/Services

Equipment and plant technology for the upgrade of nuclear, hydropower and Supplants; wind power turbine technology; solar and geothermal technologies; biomass processing technology; natural gas network technology and power grid infrastructure; renewable vehicle fuel production technologies.

Opportunities

In recent years fall and winter storms have caused wide and long-term power outages in several rural areas in Sweden. Power lines have been destroyed by falling trees ands now, and the repair work is very time consuming and dangerous. There are good opportunities for US companies supplying both power grid hardware and technology as its necessary to modify the current grid infrastructure.

In order to meet the 2020 oil independency goal, Sweden needs to expand wind, solar and geothermal power production, further improve its biomass utilization and validate new technologies that enable efficient and cost-effective biofuel production. U.S. companies can provide world-leading product and technologies within many of these areas and have good opportunities in Sweden for cooperation and technology exchange.

Resources

- Swedish Energy Agency www.stem.se
- Energy in Sweden www.svenskenergi.se

- Swedish Nuclear Power Inspectorate www.ski.se
- Svenska Kraftnat (National Grid Company) www.svk.se
- Swedish Bioenergy Association www.svebio.se

SWITZERLAND

The total Swiss market demand for electric power generating equipment was valued at an estimated $1.27 billion in 2007, and U.S. imports were valued at $44 million. The market is forecast to grow between 3-5% in 2008. Switzerland's power companies are continually seeking equipment to streamline and upgrade operations, and demand will continue to grow for power management systems (IT), switching and distribution equipment. Of the power produced in Switzerland, 40% is generated from five nuclear power plants, and the other 60% is mostly generated from hydropower, which is distributed to surrounding countries, especially Northern Italy, in order to stabilize the European grid during periods of peak demand. Hydroelectric facilities still have a limited potential for expansion but will fall short of growing demand. Other sources of renewable energy in Switzerland are in their infancy with some efforts to promote solar, geothermal and wind energy.

To prevent a predicted energy shortfall by 2020 and avoid expensive power imports, Switzerland will require an estimated $ 20-30 billion of investment in new generating facilities over the next 15-20 years. On February 21, 2007, the Swiss Federal Council (cabinet) approved a long-term strategic plan that proposes to replace the country's ageing nuclear power plants while also pursuing alternative sources of energy. Details of an action plan detailing how the government can implement its new policy has not been released, but is widely expected to be made public in 2008.Furthermore, two utility companies established anoint venture company to develop plans for two new nuclear power plants in line with the Federal Council's energy policy. The new Federal Law on Energy Supply entered into force on January 1, 2008 and its implementing ordinance will be issued in April. The law will allow the Electricity Commission to cap energy prices and business consumers of at least 100,000 Kwh to Purchase their electricity freely, therefore bypassing the expensive cantonal monopolies. The major private sector utility companies are Romande Energie, FMB, Axpo, Atel and BKW. The Swiss national grid operator "Swissgrid" is the national transmission system operator and has full responsibility for operating the 6,700 kilometers of the Swiss high voltage grid.

Best Products/Services

- Control instruments for power management and distribution
- Power management software and relevant IT hardware
- Power switching and distribution equipment
- Emergency control and management systems
- Renewable energy systems (photovoltaic, wind, geothermal, biomass)
- Equipment for power plants (generators, turbines, etc.)
- Complete turnkey power generating plants (gas, nuclear, hydroelectric)
- Small compact plants for decentralized power generation
- Engineering services

THAILAND

Thailand's market size of electric power equipment import market is over $3 billion, with products from Japan, China, and the United States capturing about57% of the total. U.S. imports to Thailand captured about 8.10% market share – Japan30.89% and China 18.02%. Other key sources included Singapore, Germany and Taiwan. Foreign manufacturers especially from the U.S., played important roles as equipment suppliers and technology providers. Thailand's electric

power equipment (ELP) is important to Thailand as the country strikes to achieve economic growth while maintaining energy security. According to the country's 2007's Power Development Plan (PDP) which covers electrical power demand conventional (gas, coal) energy, alternative (renewable) energy, and nuclear energy. The plan requires 10,547 MW additional power from 2011 to 2015; and 21,250 MW from2016 to 2021, with which 4,000MW is expecting to come from nuclear energy. As to the electric power capacity reserve margin, will be retained at the minimum 15%.

Full details of the PDP 2007 is available for public at the Electricity Generating Authority of Thailand (EGAT)'s website, http://www.egat.co.th/en/. In terms of energy resources for power generation (Jan-May 2007), there were 65.8%natural gas, 21.6% coals, 7.1% hydro, 1.6% renewable, and 3.9% oil and others. One of the important objectives of the PDP 2007 is to diversify the energy resources. The Ministry of Energy has a plan to increase the participation from renewable energy to13.5% in 2011. This will enhance the needs for renewable energy technology and equipment in Thailand.

Best Products/Services

The best sales prospects are: conventional and alternative energy development technologies (including nuclear), power generators, transmission and distribution infrastructure, substations, distribution networks, capacitors, transformers and converters, switching apparatus and energy efficiency products. Major buyers include government owned electric power authorities such as EGAT, private power producers (IPPs, SPPs), the Metropolitan Electricity Authority of Thailand(MEA), and the Provincial Electricity Authority of Thailand (PEA).

Opportunities

- **Powe**r generators and clean coal technology for the Electricity Generating Authority of Thailand (EGAT) and other private power producers.
- **Transmission a**nd distribution equipment for the Metropolitan Electricity Authority of Thailand (MEA), and the Provincial Electricity Authority of Thailand (PEA).
- **Assistanc**e and advice on nuclear power technology for the preparation and development of nuclear power plant for the Ministry of Energy and the Ministry of Science and Technology.

Resources

- EGAT Public Co., Ltd.
  53 Charan Sanitwong Road
  Bang Kruay, Nonthaburi 11130
  Phone: 662-436-3000 Fax: 662-436-3090
  Web Site: http://www.egat.or.th
- Metropolitan Electricity Authority (MEA)
  30 Soi Chidlom, Ploenchit Rd.
  Lumpini, Pathumwan, Bangkok 10330
  Phone: 662-256-3094, 662-251-6691
  Fax: 02-253-1424
  Web Site: http://www.mea.or.th
- Ministry of Energy (MOEN)
  Pibultham Villa (1897), 17 Rama 1 Rd., Rongmuang
  Pathumwan, Bangkok 10330
  Phone: 662-225-2468, 226-4123
  Fax: 662-226-4468
  Web Site: http://www.energy.go.th
- Provincial Electricity Authority (PEA)

200 Ngam Wong Wan Road
Chatuchak, Bangkok 10900
Phone: 662-953-0670, 02-590-5100
Fax: 662-590-5047, 02-589-4990, 02-590-5048
Web Site: http://www.pea.co.th

TURKEY

Turkey's demand for electricity grows at a rate of 8% per year. In 2007, Turkey produced190 billion kWh of electricity from the existing installed capacity of 41,000 MW. In case of low demand, Turkey will require 400 billion kWh and in case of high demand, 500 billion kWh electricity production a year in 2020. This means Turkey will have to increase the total installed capacity over two times of the existing capacity. Minister of Energy and Natural Resources Dr. Hilmar Gluer announced that Turkey requires an investment of $128 billion through 2020 in the energy sector. Of that, $105 billion is estimated to be in electric power generation, transmission and distribution sectors. The Turkish Government expects the majority of this investment to originate from the private sector.

The Turkish Government passed the Renewable Energy Law No. 5346, which entered into force on May 18, 2005. This law requires retail companies to buy 8% of their total electricity procurement from renewable energy generation companies. In addition, Energy Market Regulatory Agency (EMRA) (www.epdk.org.tr) has license fee exemption for renewable energy investors and The Turkish Electricity Trading Company, TETAS provides buying guarantees to renewable energy companies. Renewable energy will play an important role as Turkey's preparations for accession to the European Union is underway.

Turkish private sector is showing great interest on the renewable energy type of power generation. Companies are seeking technologies, equipment, financing and partners to implement hydroelectric, wind, geothermal, solar and biomass power plant projects. The private sector plans to invest 2000-3000 MW wind power projects over the next 3-5years in Turkey. The Ministry of Energy and Natural Resources (MENR) has developed the wind energy atlas of Turkey including information on the transmission lines and substation availability in those locations. This study showed Turkey has at least 48,000MW of wind energy potential. Recently, EMRA collected license applications for wind power, the private sector made an incredible amount of applications. Certainly, Email be very selective in awarding the licenses. Most of these companies will require wind turbines and towers and will also be seeking for potential partners and financing.

Recently, Turkish Government increased the wholesale electricity prices. Companies can sell their electricity at much higher prices through Market Accounting Conciliation Center (PMUM) set at TEIAS (see www.teias.gov.tr). Generation companies submit their price and amount of electricity that they would like to supply to the grid through submitting their bids to PMUM one day before. The following day TETAS buys the electricity by starting with the lowest bid. Currently, as there is great demand for electricity, wholesale prices are approximately at 8-9 cents per kWh levels and prices are not expected to decrease for years to come until excess capacity is in the marketplace. The new law passed recently at the Turkish Parliament brings more incentives to renewable energy generation and guarantees to have the wholesale price of at least 5.5 Euro cents per kWh for the next 10 years as well as having buying guarantees. However, at a given region, wind energy can supply up to 5-15% of the total electricity distributed. Renewable energy companies can obtain higher prices for the voluntary carbon credits received from companies, which are in the countries that are signatory to the Kyoto agreement. Turkey's hydroelectric power generation potential is 36,700 MW. Only 36% of this potential is being utilized so far. An installed capacity of over 13,000 MW hydroelectric power plants currently exists in Turkey. An

additional 10,000 MW is under construction. When these projects are completed, 45% of Turkey's hydroelectric potential will be infusing.

In recent years, State Hydraulic Works (DSI) has started tendering new projects on water usage contract basis, which requires the private sector to obtain license from the Energy Market Regulatory Agency (EMRA) and invest for the building of the dams and hydroelectric power plants on certain locations designated by DSI. The Turkish Private Sector with their foreign partners will require financing for building these new hydroelectric power plants. Investors are then free to sell its electricity to the grid or large users. In the following years, DSI plans to tender out 627 new projects at the total installed capacity of 11,000 MW.

Turkey is in the first rank in Europe and 7th rank in the world in the geothermal energy resources. Only two projects are underway so far in geothermal power generation while the large potential remains unexplored. Minerals Research Exploration Institute (MTAE)of Turkey will soon announce the geothermal atlas of Turkey. EMRA would then collect license applications for such locations. Turkey is fast moving into the liberalization of the electricity trading market. EMRA issues licenses for power generation or wholesale trading companies, which can sell its electricity generated anywhere in Turkey to any large client in any place in Turkey by paying a certain trading fee. EMRA has received license applications for over 30,000MW, half of which is for hydroelectric power plant projects. Many Turkish companies are seeking for potential foreign partners to participate in the upcoming power sector privatizations. Turkish Government will tender the privatization of its three electricity distribution grids located in Ankara, Bursa and Istanbul's Anatolian side by the second half of 2008. For the purpose of privatization, the countrywide Turkish electricity grid has been divided into 21 regions. EMRA estimates that the winners will need to make a total investment of $2.2 billion until 2020 for the upgrading of the electricity distribution grids. Many Turkish companies are seeking for potential investors room service companies to be able to bid for these privatizations. The Privatization Administration (PA) will collect bids for the privatization of 9 power plants on 22 February 2008.PA plans to privatize most of the power plants and electricity distribution grids by the end of 2009. Further information is available at www.oib.gov.tr. Turkish Parliament passed a nuclear energy law at the end of 2007, which provides electricity buying guarantee of Turkish Electricity Trading Company (TETAS) for 15years. MENR will issue the nuclear energy regulations outlining the tendering procedures which will either allow full investment to be made by the private sector or by public private partnership or otherwise by the government. To diversify the energy resources, Turkish Government predicts Turkey should have a nuclear energy power generation capacity of 15,000 MW by 2025.

Turkish Government plans to license nuclear power plant investments at the total capacity of 5000 MW by the year 2012. For this purpose, MENR and Turkish Atomic Energy Agency (TAEK) have been studying the potential sites for the construction of nuclear power plants. The first investment will be made in Akkuyu and studies are continuing for Sinop site.
Turkey has approximately 46,000 km of electricity transmission lines and approximately840,000 km electricity distribution lines. However, these lines need to be expanded to accommodate new power generation facilities including nuclear power plants to be built-In 2008 budget, Turkish Electricity Trading Company (TEDAS) is estimated to make an investment of $450 million. Turkey has electricity transmission line connections between Bulgaria, Georgia, Syria, Iran and Iraq. Turkey is trading some electricity between these countries. Another electricity transmission line is being built between Turkey and Greece to connect Turkey to the South European Grid. A Turkish company's exporting electricity to Northern Iraq.

Best Products/Services

- Cycle power plant equipment
- Geothermal and solar energy equipment
- Coal gasification system
- Remote controlled process management systems
- Hydrogen generation pilot facilities, and generator sets
- Supply of fluidized bed type lignite coal furnaces
- Heat recovery boilers
- Upgrading of electricity distribution lines and substations in particular for improvement of technical and other losses in electricity grids
- Refurbishment of existing power plants
- Ssupply and installation of power transformers and gas insulated substations for power transmission lines
- Antecede systems for the electricity distribution lines.
- If the nuclear power plant project goes ahead, supply of nuclear power plant equipment and services will be one of the major Best Products.

Opportunities

To meet the large demand in the market, manufacturing of wind and hydro turbines in Turkey can be one of the major opportunities. This would require technology transfer and manufacturing equipment supply and engineering services as well as financing services. If the nuclear power plant investment is implemented, in addition to technology transfer and equipment, nuclear safety, waste storage, fuel supply, etc. will create new opportunities in the Turkish market. The private sector is seeking for companies, which has nuclear power plant operation experience, to be a potential partner. Several Turkish companies are planning large imported coal-fired power plants and combined cycle power plants, which require clean coal technologies and gas and steam turbines, and heat recovery boilers. Supply of geothermal and solar energy equipment is some of the other opportunities that U.S. companies should consider. U.S. Eximbank will provide credit guarantees for renewable energy projects with a repayment period of 15 years after the post commissioning no matter how small the investment is.

Resources

- Ministry of Energy and Natural Resources' Web Site: www.menr.gov.tr
- Energy Market Regulatory Agency Web Site: www.epdk.org.tr
- Nuclear Atomic Energy Agency of Turkey Web Site: www.taek.gov.tr
- Privatization Administration's Web Site: www.oib.gov.tr
- Turkish Electricity Trading Company Web Site: www.tetas.gov.tr
- Turkish Electricity Transmission Company Web Site www.teias.gov.tr
- Turkish Electricity Distribution Company Web Site www.tedas.gov.tr

UKRAINE

Ukraine's market for electric power equipment has excellent sales potential for U.S. companies. We estimate this market to be $2.2 billion in size and growing at about 10% per year. Ukraine's 2030 Energy Reform Plan, released in 2005, calls for a 36% decrease in natural gas use by 2030 and a doubling of Ukraine's reliance on coal and nuclear energy sources. Major opportunities include modernization of Ukraine's outdated and highly power-consuming factories, introduction of energy efficiency technologies, possible refurbishing of nuclear power plants, possible construction of new nuclear plants, and development of alternative energy (wind, solar, waste, ethanol, biodiesel, biomass). Market obstacles include troublesome customs, licensing, and

certification procedures, and the lack of "green rates" for alternative energy. Over 48% of Ukraine's power generation comes from nuclear power plants, 45% from thermal coal/gas-fired power plants, and small amounts from hydro and co-generation. The nuclear sub-sector is state-owned and still highly dependent on Russia for nuclear fuel and essential equipment. Ukraine's thermal power generation sub-sector is mostly state-controlled, with outdated equipment and lack of funding for upgrades. The sole private, thermal power generating company, Vostokenergo, is upgrading its three coal fired power plants. The power distribution system is 30% privately-owned. The government is planning to privatize the state-owned 25% share stakes in six power distribution companies in 2008.

The major competitors to the U.S. in this market are Germany (Siemens, Bosch, and Raychem)and France (Alstom, Schneider Electric, Legrand, and Framatome). Major U.S. companies working in Ukraine's power sector include: AES – electric power distribution (owns and operates Kyivoblenergo and Rivneoblenergo regional power distribution companies),Emerson Process Management, Honeywell, Westinghouse, Holtec, GE International, and American Power Systems. Ukrainian manufacturers supply turbines, generators, transformers, and electric cable at a very competitive price but generally lower efficiency and lifetime.

Best Products/Services

- High-voltage and energy saving technologies
- Technology, equipment and software for power distribution and transmission
- Equipment for thermal power plants, process instrumentation and controls
- Heating equipment and auxiliaries
- Electrical motors for feeding pumps, portal cranes and conveyor belts
- Technologies for alternative/renewable power

Opportunities

Nuclear projects:

- Central Spent Nuclear Fuel Storage facility at the Chornobyl site (total project
- value $150 million, and long-term extended business is over $1 billion) Chornobyl Shelter Implementation Plan (SIP) and New Safe ConfinemenConstruction Project (NSCCP). (Over $ 450 million)
- Announced plans to construct additional nuclear power plants
- Khmelnitsky Unit 2 and Rivne Unit 4 Post Start-up Safety and Modernization
- Program (EUR 34.8 million loan from EBRD)
- Hydropower Rehabilitation Project (total cost $374.5 million, including World Bank loan
- $106 million)
- Energy Efficiency projects:
- EBRD loan of EUR 16.5 million to UkrESCO state-owned energy service company
- EBRD framework facility of EUR 100 million in credit lines to participating Ukrainian banks for lending to companies for industrial energy efficiency and
- renewable energy project
- Steel industry energy efficiency projects ($1 billion in EBRD financing)
- Energy efficiency feasibility study grants (USAID, $1 million)
- Municipal heating modernization projects:
- Dnipropetrovsk (EBRD loan, total project cost EUR 17 million)
- Kharkiv (EBRD loan, total project cost EUR 19 million)
- Vinnytsia (EBRD loan, total project cost EUR 12.9 million).
- Kyiv Public Building Energy Efficiency Project ($30 million)
- Odessa High Voltage Grid Project (EBRD loan of EUR 28.4 million)

Resources

- Ministry of Fuels and Energy of Ukraine: http://mpe.kmu.gov.ua
- Ukrenergo National Energy Company: http://www.ukrenergo.energy.gov.ua
- Energoatom National Nuclear Power Generating Company: http://www.energoatom.kiev.ua
- INEKO Energy Investment Company - power sector information: http://www.imepower.com
- Energobusiness Magazine - energy sector news, statistics and facts: http://www.e-b.com.ua

VENEZUELA

Electric power production requires intensive investments in all stages - generation, transmission, and distribution. In Venezuela, the area that is most in need of investment is generation. According to BRV statistics, Venezuelan power demand increased 27.2% between 2003 and 2007. Hydroelectric generation represented approximately 73% of total generation between 2006 and 2007. The 2000 to 2002 drought raised serious concerns and highlighted the need to increase and balance generation to mitigate the consequences of droughts and grid deficiencies. Investments in hydropower generation continue, however, with the incorporation of Caruachi, a 2,280 MW dam, and plans to build Tocoma, which will supply an additional 2,160. Roughly 60% of Venezuela's thermal generation infrastructure is more than 25 years old.

Although approximately 98% of the national territory receives electricity service, transmission also requires intensive capital investments. Venezuela's transmission assets were developed between the 1960's and 80's. While maintenance has generally been adequate, population growth has outpaced upgrades, creating transmission bottlenecks, particularly in the central Venezuela. President Chavez announced in January 2007 that the Venezuelan government would nationalize strategic industries, including electricity. As a result, the U.S. power-generating company, AES Corporation, sold its 82% stake in Electricidad de Caracas, the company that provides power to the Caracas metropolitan area, to the BRV in March 2007. The BRV also bought out several smaller power producers. CADAFE, the national power utility, is involved in generation, transmission, and distribution of electricity and is reported to have serious management issues and very high non-technical (commercial) losses.

The Government has an aggressive plan to supplement hydroelectricity generation with thermal generation units, many of U.S. origin. As a result, turbines rank fifth among the leading U.S. exports to Venezuela in 2007. The Venezuelan Government has also announced its intention to revamp the national electricity grid with new high-voltage transmission lines.
Venezuela imported $380-400 million in electrical power generation systems and equipment in 2006, up more than 50% from 2005. Early figures for 2007 show this rapid growth continuing. Engines, turbines, and power transmission equipment comprise 90% of these exports, most spawned by projects to revamp Venezuela's electricity grid. Despite fierce international competition, the U.S. is likely to maintain a significant market share based on the quality of its products and services. U.S. exporters should expect strong competition from other international suppliers, especially Germany, Italy, Brazil and China. Government discouragement of U.S. sourcing will have increasing impact now that the entire industry is state-owned, but a significant installed platform and historical preferences should assist U.S. suppliers in maintaining their dominance.

Resources
The Commercial Service office in Caracas closely monitors developments and opportunities in Venezuela's Electric Power sector. For more detailed information on this sector, including Market Data information, Best Products, Opportunities, and Contacts within the sector, U.S. exporters can contact our office at caracas.office.box@mail.doc.gov.

VIETNAM

The electric power sector represents one of the most promising areas for U.S. commercial prospects in the Vietnamese market. At present, Electricity of Vietnam(EVN), a state owned enterprise with more than 50 subsidiaries and affiliates, which reports directly to the Prime Minister, holds a monopoly in electricity transmission and distribution. The electric power industry is under the jurisdiction and management of the Ministry of Industry and Trade (MoIT). The Vietnamese government relies on Power Development Master Plans to manage the development of the electric power sector. These plans forecast growth in demand and map out the overall development of the power industry to meet that demand going out ten years, while also providing a twenty-year overview. The Prime Minister approved the Sixth Master Plan in Decision 110/2007/QD-TTg, dated July 18, 2007, covering the period 2006 – 2015, with an overview extending to 2025.

Demand for Electricity: Demand for electricity grew by 15% per annum over the period 1995 – 2005. The Sixth Master Plan envisions that with forecasted GDP grow that 8.5 – 9% or even higher over the period 2006-2010, the demand for electricity will grow by 17% per year (base-case scenario) and 20% per year (high case scenario) during the period 2006- 2015 (see chart 1). This soaring demand is attributed both to increasing industrial and residential use. Power shortages are expected during this period if adequate measures are not taken to increase the power supply accordingly.

IV. Trade Events

Trade events, such as trade shows, trade missions and catalog shows, offer excellent opportunities for face-to-face interaction with foreign buyers and distributors. Of the many U.S. and international events held throughout the year, some are vertical (single industry theme)and some horizontal (many industries represented). The events organized or approved by the U.S. Department of Commerce can be especially useful for first-time or infrequent participants – they require less lead time to register and typically involve more handholding.

The Trade-Event Scheduling Web sites listed below allow selective searches for upcoming events by industry, location, type and date. They typically provide the event organizer, event descriptions and costs, and people to contact for more information. To find upcoming events for U.S. Electric Power System & Services, use industry search terms relating to energy, power, solar, renewable and the like.

Schedules for U.S. Government Organized or Sponsored Events

Domestic USOC Events: http://www.export.gov/comm_svc/us_event_search.html

International USOC Events: http://www.export.gov/comm_svc/us_event_search.html

Schedules for Commercially Organized Events

TSNN (http://www.tsnn.com/)
ExpoWorldNet (http://www.expoworld.net/)
Exhibition Center - Foreign Trade Online (http://www.foreign-trade.com/exhibit.htm)

V. Available Market Research

Electric Power System & Services

The reports listed below provide more detailed information about the market for the Electric Power System & Services in the listed countries, such as demand trends, the competition, business practices, distribution channels, promotional opportunities, and trade barriers. These market research reports are written by resident U.S. commercial staff in each country.

CENTER FOR INTERNATIONAL TRADE DEVELOPMENT
13430 Hawthorne Blvd, Hawthorne, California 90250 USA
Phone: (310) 973-3173 Fax: (310) 973-3132 E-mail: **mkogon@elcamino.edu**

Hydraulic Turbines	Argentina	03/24/2008
Power Generation	Australia	01/29/2007
Electric Power	Austria	07/08/2008
The Belgian Energy Market	Belgium	12/28/2006
Electrical Power Sector	Brazil	08/16/2007
Thermal Power Plants	Bulgaria	05/28/2008
Electrical Power Systems	Canada	08/01/2008
The Ontario Energy Sector	Canada	01/04/2007
New Energy Projects	Chile	04/13/2007
Thermal Power Generating Equipment	China	03/05/2007
Power Generation Equipments	China	06/19/2006
Energy Sector Expansion	Egypt	05/06/2008
Biomass Energy	Germany	05/25/2007
Opportunities in the Energy Sector	Ghana	11/15/2007
Energy Profile 2007	Greece	06/12/2007
Electricity Sector Overview and changes to the Law	Guatemala	03/29/2007
Electrical Power Systems	Indonesia	04/30/2007
Solar Energy	Japan	08/01/2007
Power Generation and Distribution Industry	Kazakhstan	11/19/2007
Power generation and transmission sectors	Kyrgyzstan	03/05/2008
New Wind Energy Projects	Mexico	02/20/2008
Ethanol Production Start-ups	Mexico	10/30/2006
Electricity	New Zealand	06/13/2007
Electric Power Systems	Panama	09/25/2006
Electric Power Industry	Philippines	12/20/2007
Renewable Energy Services	Portugal	07/31/2006
Energy and Power Generation	Russia	05/07/2007
Power Generation and Systems	Singapore	07/16/2007
Nuclear Energy	Slovakia	12/27/2007
Renewable Energy and Alternative fuels	Slovakia	03/01/2007
Electrical Power Systems	South Africa	07/06/2007
Power Generation Equipment	South Korea	12/27/2007
Natural Gas Market	Spain	10/23/2006
Nuclear Power Plants Projects	Turkey	02/12/2007
Low Carbon Emission Technologies	United Kingdom	01/11/2008
Power Generation Sector	Uzbekistan	02/13/2008
Electric Power generation and distribution equipment	Venezuela	03/24/2008

APPENDIX

Products in Electric Power Systems & Services, by HS Code 8502

850211	Generator sets, diesel engine driven
850211	Generator sets, internal combustion piston engine driven
850211	Turbine engine generator sets
850220	Gas turbine generator sets, integral units
850220	Gasoline engine driven generator sets
850231	Generating sets, wind-powered
850239	Generating sets, n.e.s.o.i
850239	Generator sets, turbine driven
850239	Hydraulic turbine generator sets
850240	Amplidynes (rotating converter)
850240	Battery charging sets, rotating type
850240	Charger sets, battery, rotating type
850240	Condensers, synchronous
850240	Converters, frequency, rotating
850240	Converters, phase
850240	Converters, rotary
850240	Converters, synchronous
850240	Dynamotors (rotating converter)
850240	Rotating converters