China

As the world’s largest market for electricity infrastructure development and smart grid technologies, China offers great opportunities for U.S. exporters, particularly suppliers and service providers in the areas of High Voltage Transmission, synchrophasor technology and modernization of transmission operations, and partnerships in Smart City and select smart grid projects.

U.S. T&D equipment export revenues to China exceeded $77 million in 2013, growing at 5.81% on the year and at a 8.75% CAGR for the decade. China ranks 4th among top markets in terms of recent electricity growth, and ITA expects continued investment in electricity infrastructure and opportunities for U.S. suppliers of T&D equipment.

With smart meter procurements underway and the government showing a commitment to diversifying its energy mix, reducing carbon emissions, and increasing energy efficiency, China will continue to be the largest market for smart grid technologies through at least 2015. While the bulk of smart grid technologies for China’s distribution network will be provided by local suppliers in the near term, opportunities will grow for firms providing solutions to challenges of operational and network efficiency, renewable integration and management, Demand Side Management, and end-user energy efficiency.

Market Overview

China’s electricity market is dominated by coal, comprising 72% of power generation in 2012, but a major objective of the current government is to decrease coal’s share to 58% by 2030. Over the same period, investments in renewables and nuclear are expected to contribute the most to an expanding electricity supply that will be necessary to meet anticipated demand growth rates of approximately 5%/year over the period.9

China’s government has made significant recent statements regarding its intent to reduce carbon emissions, including bans on new coal-fired power plants in certain regions and reports that a national cap on emissions will be introduced in 2016. Such measures will apply major pressure to the power sector and likely accelerate the market for non-coal-fired generation, as well as smart grid and energy efficiency technologies and services. Currently, overall growth of China’s power sector is estimated at 7.7%, but the markets for renewable energy development, energy efficiency investment, and smart grid technologies grew at approximately 16%, 25%, and 34% in 2013, respectively.

Investment in the modernization of China’s electricity infrastructure and the development of a “unified strong and smart grid” have been a focus for the country’s power sector since 2010. China’s largest electricity T&D company, State Grid Corporation of China (SGCC), has largely kept pace with goals outlined in the country’s 12th Five-Year Plan (2011-2015) to boost grid investment by 68% over the period, particularly in ultra-high voltage transmission lines. The challenge of connecting major hydro and wind resources to distant population centers continues to be a major driver of China’s growing T&D market.

China also has commitments to massively expand its use of smart meters. Through 2014, tenders for 48.7 million smart meters have been contracted.10 Annual investment in smart metering was estimated to be $2 billion in 2013 and was predicted to reach $2.7 billion in both 2014 and 2015.11 In 2020, China is expected to account for over 24% of the global smart grid market, at around $96 billion, according to GTM.

Policy and Regulatory Environment

The electricity market in China is heavily regulated, with power prices at the generation and consumption...
levels both being set by the government. Although China has begun liberalizing the generation sector, it is dominated by five state-owned utilities that control almost half of total power generation capacity. The power transmission and distribution grid is entirely controlled by three state-owned electricity companies.

The National Development and Reform Commission (NDRC) plays a critical role in China’s electricity market as the primary price-setter and regulator, and the Commission also develops and implements major policies impacting the wider energy sector. The NDRC currently dictates the pace of privatization and liberalization of China’s energy markets, including the involvement of foreign competitors.

As part of a stated effort to open up the electricity sector, China is now encouraging limited foreign investment in the construction and operation of the power grid. Other market reform objectives for China’s energy sector include the unbundling and separation of owners, operators, and various business units across the electricity supply chain and the creation of an open wholesale electricity market. Progress has been slow and the separation of some of the power grid operators and generation companies is all that has been achieved to date.

Electricity prices are currently separated into residential, agricultural, and commercial & industrial (C&I) tiers, with additional levels of granularity – including peak and trough pricing – offered to C&I customers. The NDRC determines the profit margins of generators and can determine prices and incentives according to supply-type. For example, beginning in 2014, the Commission will seek to incentivize investment in hydropower development through changes to the formula used to determine hydropower-based prices.

In order to balance electricity supply and demand, China is increasingly focusing on energy efficiency opportunities, including the implementation of Demand Side Management (DSM) programs. Beginning in 2011, NDRC mandated peak load reductions for grid companies of .3% annually and has since endorsed Suzhou, Beijing, Foshan, and Tangshan as DSM pilot cities where Energy Service Companies (ESCOs) and technology solution providers work with end-users and utilities to achieve energy savings through Direct Load Control technologies, interruptible tariff programs, smart metering solutions, and Time-of-Use (ToU) pricing options. ToU pricing is expected to be available beyond the pilots, with Henan and Hubei provinces intending to implement in 2015, and national implementation targeted for 2017.

As the electricity provider for over 1 billion customers and 88% of the Chinese Market, SGCC’s investment portfolio and operating policies all have a major impact on the power market. Beginning in 2010, the grid operator earmarked over $40 billion for smart grid technologies and has since deployed approximately 250 million smart meters. Although SGCC has delayed its deployment goals, installation of another 50 million smart meters is expected over the next two to three years. Additionally, SGCC has updated its grid connection policies to enable the expanded installation of distributed energy resources. In order to better integrate and manage these resources, SGCC is also expected to invest over $6 billion in Distributed Automation technologies over the course of 2014 and 2015.
Top Markets Analysis

Spending on electricity infrastructure and the smart grid in China is expected to far outpace that of any other international market for at least the next five years. However, success for foreign suppliers over the period will be limited because of the focus on developing basic infrastructure and larger business issues that constrain exporters’ commercial opportunities in China’s energy sector.

China’s Top Markets ranking is bolstered by high scores in electricity consumption growth, T&D and overall power sector investment, and government policies and commitment to grid modernization. However, a reliance on local suppliers and a poor competitive environment for U.S. firms have a negative impact on China’s ranking, particularly in the Smart Grid ICT sector.

Opportunities and Challenges for U.S. Companies

Despite the huge investments being made in grid modernization and smart metering, the market for U.S. firms in China is significantly limited by the challenge of incumbent local supply chains and technical interoperability issues, particularly in the distribution network. However, the market for Demand Side Management (DSM) technologies that help reduce peak load and overall power consumption by end-users is an area of potential growth for U.S. exporters that have already deployed and proven these technologies at home. China is currently falling short of its goal to reduce energy consumption per unit of GDP by 15% from 2010 to 2015. Nevertheless, the national government is expected to set an even more ambitious goal for the next 5-year plan and to increase pressure on regulators and local officials to implement reforms and financial incentives to drive reduced consumption levels.

Opportunities

- Continued though declining opportunities in T&D infrastructure, particularly high voltage transmission.
- Increasing demand for network management technologies & applications following modernization of China’s substations.
- Energy efficiency programs and projects with industrial and municipal partners, particularly green data center segment.

Challenges

- The Chinese electricity market is opaque and incumbent suppliers are favored.
- Local partnerships are key to success and a coordinated effort supporting U.S. industry involvement in major projects, like smart cities, will be required.