



2016 Top Markets Report **Smart Grid** Country Case Study

Turkey

Turkey's Top Market ranking is bolstered by strong electricity demand growth, public and private sector investment in grid modernization, and steady progress in electricity market reforms. Turkey ranks high among Top Markets in terms of recent electricity demand growth, and it received high marks in the local Commercial Service assessment of the business environment for Smart Grid ICT firms.

Smart Grid
ICT
13

T&D
Equipment
11

Overall
Rank
12

U.S. T&D equipment exports to Turkey have continued to grow at a 5 percent CAGR over the last five years peaking in 2015 at over \$6 million in revenue. This growth has been largely driven by state divestment of its distribution utilities, which raised \$13 billion over three years.

Select utilities in Turkey are investing heavily in smart grid technologies, and a number of U.S. firms have already found success in the market. A major challenge for distribution companies, however, is raising revenue to support new investment, where tariffs are strictly controlled by the government regulator. As a result, maintaining and upgrading the grid, rather than digitalization, remains the priority.

Market Overview

The Turkish power sector is a mix of both public and private entities. A majority of its electricity generation – approximately 65 percent – is provided by independent power producers (IPPs) and other privately owned companies. State-owned Elektrik Uretim AS (EUAS) operates some thermal and large hydroelectric plants and provides the remaining 35 percent of the power generation.

Investment is expected to continue to focus on electricity supply growth, particularly indigenous thermal sources such as coal, nuclear energy, solar, wind and geothermal power. Non-hydro renewable resources currently account for just over 6 percent of generation, but Turkey's Energy Market Regulatory Authority (EMRA) awarded licenses for 600 MW of solar power and plans to open up the market for another 3,000 MW.

Transmission system operations and maintenance is controlled by the Turkish Electricity Transmission Company (TEIAS), a wholly state-owned company.

Distribution Grids in Turkey are owned by the government but are operated by the private sector on the government's behalf. There are 21 regional electricity distribution utilities that have been privately owned since 2013.

The Turkish Government privatized all distribution utilities, and Turkey has 21 Electricity Distribution Service Operators (DSOs). Turkish Energy Regulator, EMRA, gives importance to the quality of electricity delivered and approves five year investment plans of DSOs to improve grid infrastructure and introduce smart systems for the purpose of decreasing

Overview of ITA's Analysis: TURKEY

Strengths

- Electricity demand and grid investment growth
- Successful divestment of distribution utilities
- Smart grid working group established as part of Electricity Distribution Services Association (ELDER) with strong commitment to national deployment

Key Trends

- Continued commitment and investment in smart grid and energy efficiency technologies by the Turkish government
- Progress toward further energy sector divestment and electricity market reform

Risks

- Lack of national coordination in smart grid implementation
- Significant competition

technical and non-technical losses and black outs. This is particularly relevant to smart grid investment. Given the U.S. quality of innovative solutions, deployment of U.S. technologies in Turkey is expected to be a growing trend. Cyber security will be one of most important areas for DSOs and the national Turkish Electric Transmission Company, TEIAS.

Turkey's strategy for the electricity sector is mainly driven by the objectives of increasing energy security and domestic supplies in order to meet electricity demand growth that is predicted to exceed 5 percent per year over the near and medium-terms.

Grid modernization and distribution efficiency will also be key objectives as Turkey seeks to capitalize on the recent divestments and reduce distribution losses. Nationwide, T&D losses are at an average of 17 percent. While a majority of the utilities have losses less than 10 percent, utilities in eastern and southeastern Turkey have non-technical losses of 60 percent.

Policy and Regulatory Environment

Beginning in 2011 with the Electricity Market Law, Turkey has remained on a steady course to reform the electricity sector and strengthen the role of the private sector and market forces. As a candidate for the European Union – although already in the European Customs Union – Turkey has liberalized its electricity market. Electricity is now traded by the management of EPIAS on a day-ahead basis.

The Ministry of Energy and Natural Resources (MENR) is responsible for Turkey's overarching energy policy. The 2015 to 2019 Strategic Plan set

important policy objectives for the sector, including a goal of having 30 percent renewable resources by 2023, which includes hydropower. Feed-in tariffs have been in place in Turkey since 2011 and were reformed in order to improve the incentives for renewable resources. Turkey's tariffs, however, remain low in comparison to many European nations.

Established in 2007, The Energy Efficiency Co-ordination Board (EECB) is responsible for preparing national energy efficiency strategies, plans and programs; monitoring implementation; and assessing effectiveness. The EECB has sought to align Turkey's energy efficiency policies with those of the European Union's and has set legally-binding goals to reduce energy intensity by 15 percent by 2020, with a focus on energy-intensive sectors, such as manufacturing, transport and power generation.

Turkey is also launching energy efficiency programs that are being supported by the IFC, World Bank and the ERBD.

Privatization of state-owned power plants, mainly gas and coal, has started, and a majority of the major ones completed. EUAS keeps large hydroelectric power plants and will be the PPP partner for nuclear power plants to be built.

Top Markets Analysis

Despite the current economic slowdown in Turkey and around the world, electricity demand has continued its steady growth at 5 percent CAGR and is expected to continue growing in the next decade. As a result, Turkey will need to double its power generation capacity by 2023. ITA expects that smart grid and energy efficiency technologies will likely be

important solutions to the country's electricity infrastructure challenges.

The demand for smart grid technologies among utilities in Turkey is driven largely by the need to decrease electricity distribution losses, increase power quality and reliability, and solve problems encountered in forecasting and balancing markets.

Smart grid and smart meter deployment is developing in Turkey. As such, growth in the Smart Grid ICT Sub-Sector is expected and bolsters Turkey's ranking to 13th for the sub-sector.

Opportunities and Challenges for U.S. Companies:

Turkey is hoping to achieve investments of over \$5 billion a year in the electricity sector through 2020 to support its primary goals of increasing capacity, extending and upgrading grids, increasing network efficiency, and integrating and managing new supply sources. Turkish utilities are expected to invest \$9.3 billion in grid upgrades and other smart grid investments during the next five years.

Additional prospects are services and products in the following areas:

- Automated meter reading systems
- Renewable resources integration and monitoring systems
- Demand management and reactive power control systems
- Utility IT and communication system upgrades

Although European suppliers have a major presence in Turkey's electricity sector, U.S. smart grid firms have proved highly competitive in the early stages of market development. The U.S. Commercial Service, in cooperation with U.S. Trade and Development Agency, is extremely active in supporting smart grid exporters in Turkey, including technical and regulatory workshops, feasibility studies and pilot projects.

The smart-grid sector in Turkey often faces some of the following challenges:

- Limited budget allowed by EMRA
- Lack of standards
- Ownership of meters belongs to customers thus limiting the activities of distribution companies

Know Your Buyer

Turkish purchasers of U.S. smart grid goods and services include generation, transmission and distribution companies.

Summary of Resources

- U.S. Department of Commerce Turkey Country Commercial Guide: <http://www.export.gov/ccg/turkey090909.asp>
- Turkish Energy Market Regulatory Authority (EMRA): <http://www.emra.org.tr/>