



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

Saudi Arabia

Saudi Arabia ranks fourth overall in the Smart Grid Top Market Report. U.S. exporters of T&D equipment find increased opportunities in the Middle East’s largest market. An understanding of Saudi Arabia’s electricity policies starts and ends largely by focusing on trends in global oil prices. Proven crude oil and natural gas reserves, as well as generous subsidies, have driven energy demand growth over the last several decades.



Over the last year global oil prices have hit decade lows, creating uncertainty in the electricity market, and affecting investment, policy, and regulatory decisions. Opportunities for U.S. smart grid exporters, however, remain high in Saudi Arabia, with its ranking largely driven by high T&D equipment exports. ITA expects that as regional interconnections and renewable energy deployment plans move forward, interest in implementing smart grid ICT solutions will characterize the market.

Market Overview

The electricity market in Saudi Arabia has grown rapidly for over 20 years – virtually doubling in size since 2000 – with expectations that electricity generation will continue to grow at just over 5 percent annually over the next few years.¹ An additional generation capacity of 2 to 4 GW needs to come on line each year to meet the country’s growing electricity demand.² ITA assesses that Saudi Arabia’s aggressive infrastructure expansion program to increase electricity generation, efficient distribution, fuel diversification, and energy conservation will be restrained as oil prices remain low.

That being said, Saudi Arabia remains the biggest power market in the Gulf Cooperation Council (GCC), and spending on infrastructure will need to continue. Opportunities for private sector investment will likely increase as the Saudi Government cannot fund infrastructure projects at the rate it once did. The electricity market is dominated by one firm, Saudi Electricity Company (SEC), with Saudi Government maintaining a majority stake in the firm. The utility generates almost 75 percent of the country’s power, while other producers include the Saline Water Conversion Corporation (SWCC) and Saudi Aramco. The SWCC operates 32 plants that desalinate water and supply electricity, with total annual output of around 2.5 GW of power.

Downstream SEC maintains virtual monopoly status to operate the grid and transmit under the subsidiary National Grid, distribute and sell electricity. The SEC has launched a series of projects to overhaul outdated segments of the power grid and lay the groundwork for a modern transmission and distribution system. There are plans to spend nearly \$14.7 billion for the transmission of electricity and \$13.7 billion for the distribution of electric power over the next 10 years.

Overview of ITA's Analysis: SAUDI ARABIA

Strengths

- Electricity demand and grid investment growth
- High competitiveness for T&D equipment exports

Key Trends

- Building out of regional interconnections
- Support to modernize the grid to integrate new, anticipated renewable energy deployments

Risks

- Political and economic issues could derail electricity market reform and/or investment

SEC has expanded its transmission network by over 50 percent since 2000. SEC has stated that it expects investments in transmission to reach \$80 billion through 2020. The SEC has focused much of its longer-term investment on interconnecting the Kingdom's transmission network both internally, between the western, central, and southern provinces, and internationally.

The Gulf Cooperation Council Interconnection Authority's (GCCIA) Interconnection Project includes three phases that connects Saudi Arabia, Bahrain, Kuwait and Qatar via overhead and submarine lines in order to help provide improved aggregate demand and supply over a wider area and meet peak loads in the summer. The project was funded by a handful of sources, where SEC provided almost half the total to connect the GCC states. .

The SEC has also carried out a feasibility study to build a 3 GW underwater interconnection with Egypt to balance daily and seasonal peak loads. There are plans to eventually expand the connection to Europe as to better utilize existing generation capacity during non-peak operating seasons.

Experts estimate that power losses along the distribution system are approximately 9 percent of total output and will slowly drop over the next decade as grid modernization moves forward.³

SEC plans to accelerate its investments in the smart grid, including a significant smart meter roll out across the country. One component of the Kingdom's smart grid and energy efficiency program was put into place in 2010 when electricity tariffs for industrial and large commercial customers were increased and variable tariffs were introduced to encourage conservation during peak demand hours.

Tariffs increased again in January 2016 for all users as the decline in oil exports has led the Saudi Government to begin reducing subsidies.

In order to implement the new tariff system in the private consumer sector, SEC sees smart meters as a necessary tool for its customers. With a number of pilot projects completed in Riyadh, SEC is now looking to roll out smart meters to the rest of the country. Investment in the distribution system in Saudi Arabia, including smart grid systems, is predicted to reach \$24 billion over the next decade.

Policy and Regulatory Environment

The development of Saudi Arabia's electricity market is overseen by three major government entities: the Electricity and Co-Generation Regulatory Agency (ECRA), King Abdullah City for Atomic and Renewable Energy (KACARE), and the Ministry of Water and Electricity.

ECRA is the independent watchdog and standard setter for the Kingdom's electricity industry. ECRA assesses tariffs, issues licenses, monitors service providers, investigates complaints, establishes quality of service standards and promotes fair competition among providers and suppliers.

Meanwhile, KACARE drives the integration of clean energy sources in Saudi Arabia and the development of energy efficiency programs and directives.

The Ministry of Water and Electricity (MOWE) is responsible for setting and long-term energy plans and policies for the electricity sector. MOWE also oversees private investment in the water and electricity sectors.

ECRA is in the midst of a comprehensive long-term plan to privatize and deregulate the electricity market,

starting with the structural separation of the vertically-integrated electric supplier monopoly, SEC. ECRA has stated its intent to separate and introduce private competition to SEC's generation, transmission and distribution networks, where there are expectations that the market will be reformed to increase competition in distribution and retail sales. Today, however, competition exists only in the form of Independent Water and Power Plants (IWPP) that compete with SEC in the generation market and that are integrated with its grid.

More broadly, the Saudi government has set a number of goals for the wider energy sector that will likely act as key drivers for investment in the country's electricity infrastructure and services; these include:

- reductions in the amount of crude and natural gas-fired electricity generation;
- establishment and development of nuclear power;
- integration of solar energy supplies for electricity;
- interconnection of the regional electric grid;
- increased reliability and efficiency of electricity transmission and distribution; and
- the achievement of significant energy efficiency gains among residential, commercial, industrial and government consumers.

The Saudi Government has sought to reduce its dependence on fossil fuels, not out of a need to address climate change but so that it can export more fossil fuels. In 2012, the King Abdullah City for Atomic and Renewable Energy (KACARE) released Saudi Arabia's National Energy Plan, which noted that the Kingdom would meet its 54 GW goal by developing 16 GW of solar PV, 25 GW of solar thermal and 9 GW of new wind power by 2032. Delays in projects and market uncertainty, however, caused the Saudi Government to push back this target to 2040 as part of its INDC submission to the UNFCCC negotiations in late 2015, which also included goals to reduce its energy intensity between 2005 and 2030 by 30 percent.

MOWE released a new power sector strategy white paper for the Kingdom that forecasted its needs and requirements through 2040. The plan focuses heavily on sustainability, conservation, and planning in order to reduce the energy use, as Saudi Arabia has one of the world's highest levels of energy and electricity intensity. Its consumption per capita is twice as high as

of that Western Europe, and almost double of the United States.

Since Spring 2015, the tanking of global oil prices has led to the government moving forward on unprecedented cuts to gasoline subsidies, and there are indications the government may sell off some of its stake in SEC in order to raise capital. According to the IMF, fossil fuel revenues account for 55 percent of the Saudi Government budget, so the changing oil prices are debilitating the national budget.

Market Analysis

T&D equipment sales to Saudi Arabia outperform U.S. exports in all goods. U.S. T&D equipment exports to Saudi Arabia peaked in 2012 but, since a drop in 2013, have continued to grow year-to-year to \$79 million in revenues in 2015. This reflects a five-year CAGR of just over 12 percent.

As the country's transmission and distribution infrastructure is modernized, commercial and industrial scale consumers will also seek to capitalize on potential energy efficiency gains through investments in smart grid and smart building technologies and services. The market potential for residential and industrial energy efficiency products and services is projected to grow rapidly as a result, and a wide range of opportunities for U.S. companies in the green building and energy efficiency subsectors are expected to open up.

Opportunities and Challenges for U.S. Companies

SEC has become more open to public-private partnerships and private investment in recent years.

Opportunities

- Some of the needed smart grid solutions that have been identified in Saudi Arabia include: system monitoring, outage management, substation automation, synchrophasor technology, wide area network management and distribution automation.
- Working to curb energy demand and preserve domestic fossil fuel resources makes demand response and other energy efficiency programs attractive.
- The goal to achieve a reliable and interconnected transmission network will drive expanded short and

medium-term opportunities for high voltage transmission systems and related equipment.

Challenges

- Reduced loss of capital for purchases resulting from a sustained period of low oil prices

Know Your Buyer

Although American exporters are not required to appoint a local Saudi agent or distributor to sell to Saudi companies, ITA strongly recommends that all new-to-market U.S. companies consider partnering with a local company for the purposes of monitoring business opportunities, navigating import and standards testing regulations, and identifying public sector sales opportunities.

Summary of Resources

- U.S. Department of Commerce Saudi Arabia Country Commercial Guide: <http://www.export.gov/ccg/saudiarabia090959.asp>
- Ministry of Water and Electricity: www.mowe.gov.sa
- Saudi Electric Company (SEC): www.se.com.sa
- Saline Water Conversion Corporation: www.swcc.gov.sa
- Water and Electricity Company (WEC): www.wec.com.sa
- Power and Water Utility Company for Jubail and Yanbu: www.marafiq.com.sa
- Electricity and Cogeneration Regulatory Authority: www.ecra.gov.sa

¹ Business Monitor International, *Industry Forecast – Saudi Arabia Power Forecast Scenario*, 25 September 2015

² Business Monitor International, *Industry Forecast – Saudi Arabia Power Forecast Scenario*, 25 September 2015

³ Business Monitor International, *Industry Forecast – Saudi Arabia Power Forecast Scenario*, 25 September 2015