Electrical Power Systems in Saudi Arabia

Overview

Power demand is rising rapidly in the world’s top oil exporter of more than 24 million people, as oil revenues fuel economic expansion in the vast desert state. According to experts Power generation capacity in the kingdom needs to grow threefold over the next 25 years to meet future demand. Capacity needs to rise to 115,000 megawatts in 2032, from current capacity or around 35,000 megawatts. Saudi Arabia has embarked on a program to boost the kingdom’s electricity generating capacity, with a huge program to build new power plants and expand existing ones. Annual growth in demand is running at up to 8 per cent and the kingdom’s power sector regulator, the Electricity & Cogeneration Regulatory Authority (ECRA), says an additional 35,000MW will be required over the next 10 years to meet projected demand and to build up reserves of 15 per cent of generating capacity. This will require capital expenditure of $53 billion.

Saudi Electricity Company (SEC) is in the front line in the government’s efforts to build power capacity as quickly as possible, and the long-mooted move to break the company down into its constituent parts is now imminent.

Saudi Arabia plans to encourage the private financing of future power plants, but state-run SEC remains at the heart of the government’s efforts both to expand generating capacity and liberalize the power sector. SEC currently owns power plants generating more than 84 per cent of the kingdom’s electricity.

Currently, the SEC owns 49 generating plants around the country and generated 30,670MW of power in 2007. Formed in 2000 following a royal decree that merged Consolidated Electrical Companies and the projects of the Electricity Corporation into one company, more than a quarter of SEC was subsequently sold off and the company is now owned 74 per cent by the government, 7 per cent by Saudi Aramco and 19 per cent by the Saudi public. It is listed on the Saudi stock exchange (Tadawul).
Such is the SEC’s size that it has a virtual monopoly in generation, transmission and distribution within Saudi Arabia, and is one of the largest corporations in the country. It is by far the largest utility provider in the Gulf.

**Best Prospects/Services**

In September 2009, SEC released its own forward projects plan, which details its work program up until 2023. Between 2010 and 2018, the company intends to issue 33 tenders for new or expanded power plants, which will add a total capacity of 21,065MW to its current load. It is a huge program, covering all regions of the country, but initially concentrating on the northwest. The first projects – expansions of the Tabuk, Al-Wajh and Tabarjal power plants – are expected to come on line in 2012, with additional capacity at Rabigh and Duba coming on line soon after. But over the course of the program, the bulk of the additional capacity will be added in the east of the country, in the industrial Al-Jubail/Ras al-Zour/Al-Uqair triangle, and in the west near Jeddah.

From 2010 on, the plan includes extension work on new IPPs the SEC has already initiated. The first of these is at Rabigh, which will provide 1,200MW of new capacity by 2013. Separate projects at Riyadh and Qurayyah will come on line in the following two years.

The SEC and its advisers continue to evaluate developers’ bids, opened on 21 December 2009, for the Riyadh PP11 independent power project (IPP). Five consortia bid for the build-own-operate (BOO) plant, which is expected to produce up to 2.0gw of electricity. The lowest bidder for the plant was the Marubeni consortium at 7.7721 hals/kwh, which considerably undercut the others ranging from 10.79 hals/kwh 12.99 hals/kwh

In addition to a massive expansion of its power generation capabilities, Saudi Arabia requires substantial investment in power transmission and distribution (T&D). Saudi Arabia’s vast size, harsh climate, and rugged terrain have put constraints on the type of power lines that can be utilized to link the country’s four power regions. The SEC has therefore embarked upon a series of projects to overhaul outdated segments of the network and lay the groundwork for a modern T&D system. The SEC plans to spend nearly $14.7 billion for the transmission of electricity and $10.7 billion for the distribution of electric power in the next 10 years.

The Saudi Government seeks private investment to expand generation capacity, unify its national electricity grid, and switch its power plants from heavy oil to natural gas. The market for power generation, transmission, and distribution in Saudi Arabia is currently one of the fastest growing
and most lucrative in the Middle East. Saudi Arabia has embarked upon an ambitious national development plan that aims to bolster operations and investment opportunities across all key economic sectors.

Saudi Arabia’s development plans over the next decade include the construction of whole new cities and a significant expansion of the petrochemical, mining and petroleum industries. Power generation and its related infrastructure form the backbone of the development plans. Moreover, the power industry will serve as a crucial determinant of whether Saudi Arabia will meet its development goals and become one of the top 10 most competitive economies.

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) in 2001. A new electricity law was passed in 22 November 2005, and was published in late 2007. The new law is central in the regulation and development of the electricity sector in the Kingdom. The general features of the law cover provision of reliable services, protecting consumer’s rights including reasonable prices, while protecting the rights of investors in the sector to receive a fair return. ECRA has the responsibility of providing a clear, stable, non-discriminatory framework and creating a suitable environment to foster legitimate competition in the industry.

Generating Capacity Distributed by Technology in Saudi Arabia:

Steam units: 12,795 MW
Gas units 22,356 MW
Combined cycle units: 2,271 MW
Diesel units: 327 MW
Total SEC power capacity: 37,749 MW
Rented Diesel units: 558 MW
Contributed capacity (by others, SWCC, ARAMCO, and MARAFIQ): 6,595 MW Total capacity: 44,902 MW up to the end of 2009.

Below are some of the areas that will have good potential in the power generation sector:

• 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

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