World Economy Brief

February 8, 2018 | Vol. 8 No. 4 | ISSN 2233-9140

Electricity Industrial Policies in the Middle East and their Implications for Korean Companies

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I. Introduction

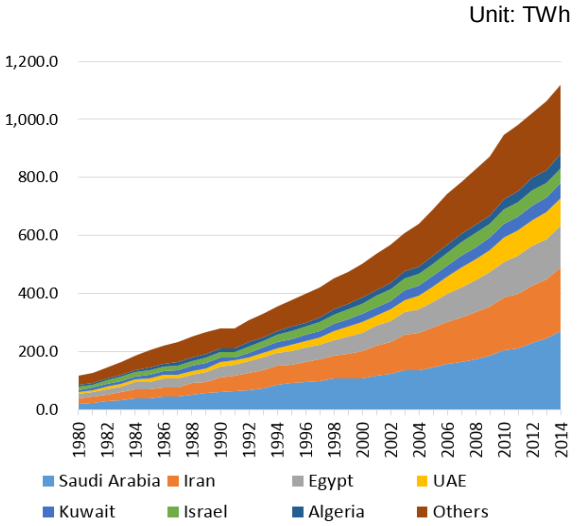
The electric power industry plays a significant role in promoting the diversification of the economic structure in Middle Eastern countries as a stable supply of electricity is necessary for the operation of manufacturing and logistics facilities. Towards this, construction projects for renewable power plants and other new power plants should be continued in accordance with the increasing demand of electricity in the industrial sectors. Various projects for the modernization of transmission and distribution networks and the establishment of a smart grid system should also be promoted to enhance energy efficiency in the use of electricity. Recently regulatory measures prohibiting inefficient electric products are being implemented to reduce waste of electricity across the region.

Considering these industrial trends and new business opportunities in the region, it is necessary to examine sectoral policies and industrial environments for broader cooperation between Korea and the Middle East in the field of the electric power industry. In particular, the industry can offer more policy implications to small- and medium-sized enterprises that are aiming to expand their businesses into the Middle East, as many of the projects mentioned above involve ICT (information and communication technology) and electric components.

II. Demand and Supply of Electricity in the Middle East

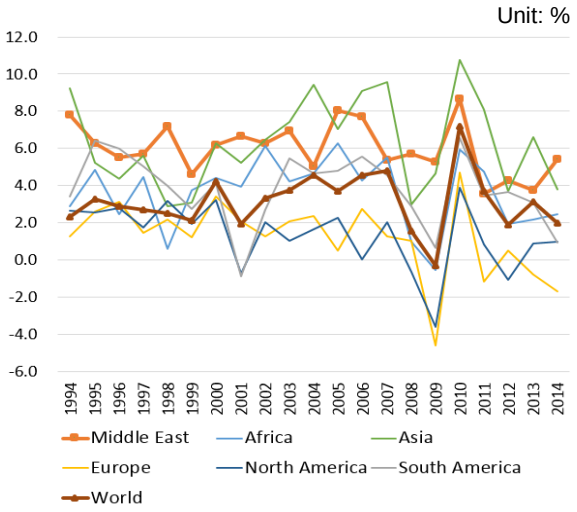
Electricity demand in the Middle East, including the five North African countries, has been soaring rapidly for the past 20 years or so. The total electricity demand of the region reached 1,118 TWh in 2014, climbing two times higher than the usage in 2000 and four times higher than the usage in 1990. The compound annual growth rate (CAGR) of the demand for electricity in the Middle East recorded 5.8% from 2004 to 2014, with Bahrain (12.6%) and Oman (11.2%) showing the fastest growth within the region. The CAGR of electricity demand in the Middle East exceeded that of the world and other emerging regions, including Africa (2.7%) and South America (3.1%).

Figure 1. Changes in Electricity Demand of the Middle East



Source: EIA, International Energy Statistics (accessed March 21, 2017.).

Figure 2. Annual Growth Rate of Electricity Demand by Region

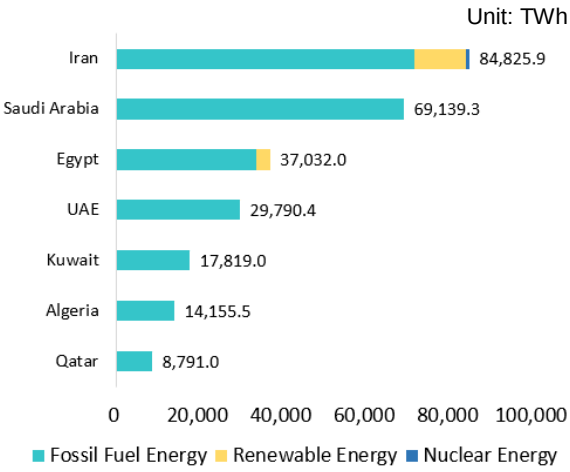


Source: EIA, International Energy Statistics (accessed February 15, 2017.).

Meanwhile, the per capita and household electricity consumption of the Middle East is generally higher compared to those of other regions. This is mainly due to the fact that, while the industrial base of the region is relatively weaker, the cheaper price of electricity – caused by huge governments' subsidies – results in excessive consumption in the household sector.

At a similar rate with the demand, electricity supply has been sharply increasing in the Middle East as well, from 311 TWh to 1,293 TWh between 1990 and 2014. This is a result of the fact that many countries in the region have adopted policies to expand their generation capacities in order to respond to the rapidly increasing demand for electricity. The Middle East has shown an average of 6.6% generation capacity growth over the course of a decade, reaching 333,751 MW in 2014. Iran and Saudi Arabia have the largest generation capacity among the nations within the region, at 84,825 MW and 69,193 MW respectively, followed by Egypt (37,032 MW) and UAE (29,790 MW).

Figure 3. Generation Capacity of Major Countries in the Middle East (2015)



Source: BMI (2015), p. 15, BMI (2016a), p. 17, BMI (2016b), p. 17, BMI (2016c), p. 17, BMI (2016d), p. 16, BMI (2016e), p. 26, BMI (2016f), p. 21.

The Middle East is yet highly dependent on fossil fuel energy. Fossil fuel energy accounted for 96.5% of total electricity generation in the Middle East in 2014, while that of the world only recorded 65.9%. Moreover, rela-

tively higher electricity distribution losses due to the deterioration of related equipment have been a feature of the Middle East electricity sector as well. In 2014, 14.4% of the total electricity generated in the region was lost during the distribution process.

III. Policy Changes in the Generation Sector and Their Implications

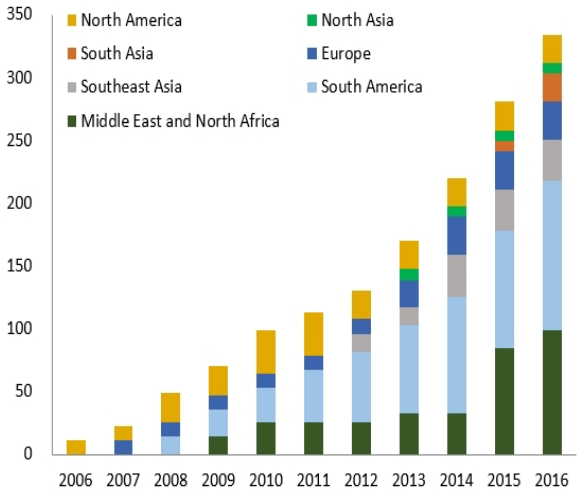
Middle Eastern countries including Saudi Arabia, UAE and Egypt have been expanding their power infrastructure. Although thermal power plants using oil and gas are prevalent in these nations, accounting for more than 90% of total generation, these countries are trying to increase their share of alternative energy power plants including renewable and nuclear energy. Moreover, decreasing costs associated with solar and wind power generation have led these countries to be more active in expanding renewable power generation.

While companies in Europe, the United States, Japan, and China have been leading the renewable energy and nuclear energy projects in these countries, Korean companies are showing a relatively low level of participation, particularly when compared to thermal power generation projects. As the proportion of alternative energy projects is expected to increase in the future, Korean companies will also need to diversify their fields of business. Moreover, Korean companies with technological capabilities will need to develop customized technology considering local market characteristics, find reliable local partners, and expand strategic alliances.

Meanwhile, the increase in gas demand is making gas-importing countries consider constructing FSRU (Floating, Storage, Regasification Unit) facilities, a promising field for Korean shipbuilding companies with competitive edge. In addition, fostering shipping companies for operation of FSRU will be necessary to generate new revenue streams.

Figure 4. Floating LNG Regasification Capacity by Region

Unit: million cubic meter per day



Source: EIA, International Energy Outlook 2016, Natural Gas (accessed April 11, 2017.)

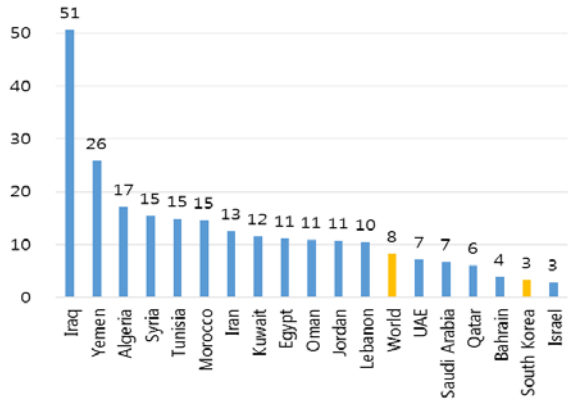
With the economic slowdown and fiscal aggravation in Middle Eastern countries since the drop in oil prices in the second half of 2014, heavier reliance on private investment is expected, eventually leading to the expansion of IPP (Independent Power Producer) and IWPP (Independent Water and Power Producer) projects in the region. With priority being placed on investment to the power sector, Korean companies will have more opportunities to enter into the Middle East power market. With the share of IPP and IWPP projects growing in the power sector, in particular, Korean companies need to transform their role into that of a developer in charge of overall operation of projects, including financing.

IV. Energy Efficiency Policies and Their Implications

GCC countries such as Saudi Arabia and UAE are working to connect each country with a power grid that applies a 400 kV HVDC (High Voltage Direct Current) transmission scheme to improve the efficiency of electric supply. It is expected that the GCC countries will introduce a sophisticated power trading system and expand this grid to Egypt, Jordan and other Middle Eastern countries. Egypt is also concentrating on modernizing its local transmission and distribution lines to reduce distribution losses.

Figure 5. Electric Power Transmission and Distribution Losses

Unit: %



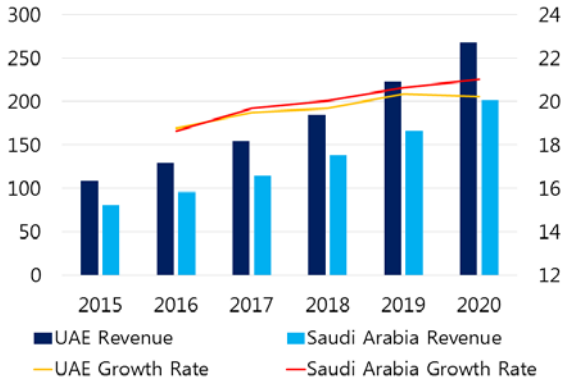
Source: World Bank. Data. Electric power transmission and distribution losses (% of output) (accessed May 2, 2017).

Middle Eastern countries are not only trying to modernize their electricity distribution and transmission infrastructure but also aiming to introduce a smart grid that incorporates information and communication technology in their power grid. In the smart grid sector, most policies and business projects are focused on AMI (Advanced Metering Infrastructure) test projects or the introduction of smart meters. In particular, UAE is carrying forward smart grid projects that combine renewable energy and ESS (Energy Storage System).

In the area of improving energy consumption efficiency, policies to grade and regulate energy efficiency standards, or to improve public awareness on energy savings, are being promoted. For the efficient management of energy consumption, Middle Eastern countries are introducing BEMS (Building Energy Management Services), with Saudi Arabia and UAE showing higher growth in the field.

Figure 6. BEMS Market in UAE and Saudi Arabia 2015-2020

Unit: Millions of U.S. Dollars(LHS), %(RHS)



Source: Technavio (2015), Building Energy Management Services Market in Middle East, p. 40, 42.

It will be necessary to develop high value-added products to advance into the market for electric power equipment in these countries. This is because local companies in Saudi Arabia and UAE are producing general electric equipment and their governments are encouraging construction companies to use local products to nurture the domestic industry. In addition, Korean companies should consider joint ventures with local power companies, and conduct OJT (On the Job Training) programs and technology transfer with local companies to establish favorable business condi-

tions for their advance into the region.

V. Concluding Remarks

Government policies that help Korean companies expand their market in the Middle East can be suggested as follows. First, financial support policies should be considered, to help these companies deal with project-developing costs incurred, for instance, for feasibility studies. More financial incentives could also be provided as more Korean contents are used in the projects.

Second, more support should be considered for small- and medium-sized enterprises that cannot advance into the Middle Eastern market by themselves due to a lack of financial resources and track record in the region. Cooperative relations between large companies and SMEs are necessary for SMEs to expand exports of equipment and materials used in the power plant projects. The sharing of information on the projects among large companies and SMEs could be helpful in strengthening their cooperation. Joint ventures between SMEs and local companies need to be supported with policy loans.

Third, new business projects that incorporate ICT in the electricity industry, such as smart grids, AMI (Advanced Metering Infrastructure), ESS (Energy Storage System) should be systematically developed in the region. Initially, consulting projects should be promoted with government officials including a master plan for smart grid establishment and energy efficiency improvement programs. This should be followed by test-bed programs to examine the feasibility of the masterplan. A Korean consortium between large companies and SMEs could be awarded orders based on consulting and test-bed results.

Fourth, a control tower should be set up in order to coordinate different interests among companies, banks and supporting institutions. It could also work as a platform to build a strategy to win government contracts. In addition, a corporate cooperation system should be established to share information on various projects, financial sources, success and failure cases of winning orders, and so on. This would be helpful to expand cooperation among Korean companies and financial institutions, exploring new business opportunities in the Middle East. KIEP