論説 Commentary

Middle Eastern petrochemical industry strategy and Japan's role

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Movements toward democratization and the positioning of the petrochemical industry

The Arab Spring (Jasmine Revolution) that started in Tunisia at the end of 2010 has spread broadly throughout the Middle East[1] from Egypt, Libya, and Algeria to Syria, Bahrain, Yemen, and even Iran. Long-standing regimes in Tunisia, Egypt, and Libya have collapsed and the process toward democratization has begun. There are concerns about the impact to gulf coast oil-producing countries, which Japan, with its energy situation of nearly 90% reliance on Middle Eastern oil, is also unable to ignore. Qatar is the world's top exporter of liquefied natural gas (LNG), and Japan is its top importer, leaving Japan heavily reliant on the Middle East that it must keep an eye on such developments.

The economies of the Middle East remain strong thanks to a high level of revenue from oil. At the same time, the greatest issues for the region are job creation and utilization of the resources it has, with each country taking its own initiatives to develop its various industries. The petrochemical industry is the most competitive among them, and is being emphasized as a promising industry.

Overwhelming competitiveness via low-cost feedstocks, exports absorbed by Asia

Full-fledged ethylene production[2] in the Middle East began in 1985 in Jubail and Yanbu, Saudi Arabia. Since oil prices started to rise in 2004, major new petrochemical plants and expansions of existing plants have been planned one after another, with the total ethylene capacity of the Middle East reaching 27.7 million tons per year (18% of the global total) as of the end of 2011. Japanese corporations such as Mitsubishi Corporation and Mitsubishi Chemical have formed the joint venture Sharq with Saudi Basic Industries Corporation (SABIC), while Sumitomo Chemical and Saudi Arabian state-run oil company (Saudi Aramco) have formed the joint venture PetroRabigh, both of which manufacture ethylene.

Since the main feedstocks for petrochemicals in the Middle East is natural gas, the region possesses overwhelming cost competitiveness. In Saudi Arabia, ethane is fixed at 75¢ per MMBtu[3] ($37 per ton), which has made it an order of magnitude cheaper than naphtha, which itself has increased in price roughly in proportion to the price increase for crude oil. Moreover, with the world's leading companies coming on-stream with state-of-the-art technologies at maximum capacity, cost competition is about to heat up. Despite this, besides Qatar and Iran, the countries of the Middle East are finding it difficult to secure new ethane for their expanding petrochemical plans, and so they are channeling resources into natural gas development.

On the other hand, due to the advancement of extraction technologies in the "shale gas revolution," in which development on shale gas is proceeding rapidly in North America, the region's petrochemical industry is being re-empowered as the gas price that had for a time risen to $12 per MMBtu is now down to around $3.50.

In recent years, most of the increase in the world's production capacity of commodity petrochemical products has been in the Middle East and China. The problem is that the Middle Eastern market is small, so almost all of the additional production in the Middle East is exported. Initially, since production launches were concentrated in 2008, Middle Eastern petrochemical products flooded Asia in bursts and led to oversupply fears, but as of 2011, healthy demand in China and other Asian countries is preventing oversupply from emerging. However, the augmented petrochemical facilities in the Middle East are exerting a gradual downward effect on Asian petrochemicals.

Internationalization and forays into the consumption region of Asia

In the past, the Middle Eastern oil-producing countries had pursued major petrochemical projects themselves by taking advantage of low-cost feedstocks, but the enormous revenues derived from oil and gas are recently being used to buy out companies and actively enter the consumption region of Asia.

Since 2002, SABIC has acquired Holland's DSM petrochemical business, the United Kingdom's Huntsman Petrochemicals, the United States' Scientific Design and GE Plastics, and others, in order to internationalize.

Moreover, to participate directly in the Chinese market, SABIC has formed a joint venture with Tianjin Petrochemical of China Petrochemical Corporation (Sinopec) and has been operating ethylene facilities since May 2010.

Meanwhile, Saudi Aramco has established a joint venture with Sinopec/ExxonMobil and has been operating an oil refining and petrochemical complex since 2009. In addition, Borouge of the UAE is operating a compound plant in China.

Furthermore, in March 2011, Kuwait Petroleum Corporation (KPC) was approved for oil refining and petrochemical planning, owing to a joint venture with Sinopec, and has started the construction. Refinery construction is also planned in Indonesia and the right to take a tax holiday (temporary exemption from taxes) has already been obtained.

The move toward high value-added products, the construction of industrial clusters and privatization

In recent years, in an attempt to create jobs, the government of each Middle Eastern country has been focusing on moving toward high valued-added products and the nurturing of downstream industries.

SABIC set up a Specialties SBU (strategic business unit) in

2007 and is making it clear that it plans to raise the sales percentage of polycarbonate and other performance chemical products to 25-30% of sales by 2020. SABIC has already decided to engage in joint ventures with ExxonMobil for carbon black, synthetic rubber, and special thermoplastic polymers, with Asahi Kasei/Mitsubishi Corporation for acrylonitrile, and with Mitsubishi Rayon for methyl methacrylate/acrylic resin molding materials.

Although the Middle Eastern petrochemical industry started off with state-run corporations such as SABIC and Iran's National Petrochemical Company (NPC), privatization is advancing with a focus on downstream products in order to invigorate the economy and boost the dynamism of the private sector. Particularly in Saudi Arabia, Sipchem and Sahara of the Zamil group, Tasnee, and other major private corporations are being cultivated. Tasnee and Sahara have decided to engage in a joint venture with Rohm and Haas on acrylic acid/ester, and with Evonik on super-absorbent polymers.

Moreover, through structural reforms from a long-term perspective, the Saudi government has set a target of creating an internationally competitive industry and is formulating a National Industrial Clusters Development Program (NICDP). Presently, the construction of six industrial clusters (automobiles, durable goods, metal processing, construction materials, packaging materials, solar) is being dynamically advanced. However, achieving this target will require technical development capabilities, cultivation of supporting industries, and an industrious national character, and on account of this the task ahead is anticipated to be rather difficult. For this reason, aid is expected from other countries, especially from Japan.

An increasingly influential GPCA

In order for the companies of the petrochemical industry in the gulf coast of the Middle East to discuss shared challenges, the industry established the Gulf Petrochemicals and Chemicals Association (GPCA) in 2006. Currently, the 35 full members include SABIC, Qatar Petroleum (QP), Tasnee, Borouge, Equate, NPC, and other major Middle Eastern petrochemical corporations, with 135 companies joining from around the world as associate members. The GPCA is becoming an important association on a par with the U.S. National Petrochemical & Refiners Association (NPRA), the European Petrochemical Association (EPCA), and the Asia Petrochemical Industry Conference (APIC). The rapid expansion of petrochemical products exported by Gulf oil-producing countries is increasing the influence of these countries year after year.

Moving forward, the GPCA plans to provide database information on the production capacities and production quantities of main petrochemical products to full members, which will be compiled by Mitsubishi Chemical Techno-Research (MCTR).

Future challenges and Japan's role

The Middle Eastern petrochemical industry is currently undergoing a major transition phase. In the past, the industry expanded production of general-purpose petrochemical products, but now major petrochemical projects are slowing down due to the ethane shortage. However, in July 2011 Saudi Aramco and Dow Chemical established Sadara Chemical, under which the world's most expensive, super-large-scale, $20-billion petrochemical project is in progress, to be completed in 2015. The plan is to use an ethane/naphtha combination for the raw materials. In addition, including major petrochemical projects in Qatar, the UAE, Kuwait, and elsewhere, oversupply of petrochemical products could be an issue around 2016.

Japanese companies have strong technical capabilities, so they must accelerate their moves toward high-performance and high value-added products. They also have the advantage of being near the consumption regions of China and Southeast Asia where demand is surging, and they must further strengthen their highly processed products for high-performance chemicals and for the automotive and electrical equipment industries while making use of their unique characteristics, such as butadiene derived from naphtha.

Following the Great East Japan Earthquake, Saudi Arabia and Kuwait have provided crude oil and other materials to Japan free of charge, and Qatar has assisted with additional supplies of LNG. This is surely the result of the friendly relations Japan has cultivated with the countries of the Middle East for a long time. Moving forward, Japan needs to maintain its cooperation with the Middle East, differentiate itself from the Middle East in terms of petrochemicals, which still have much scope to grow globally, and advance each company's efforts with focus on dynamic projects with a clear global strategy.

1) The "Middle East" here refers to the generally adopted regional concept (mainly in the Arabian peninsula, Afghanistan in the east, Morocco and Mauritania in the west, Turkey in the north, and Sudan in the south).
2) Ethylene-producing countries are the following 11, in order from highest capacity to lowest: Saudi Arabia, Iran, Qatar, UAE, Kuwait, Turkey, Libya, Egypt, Israel, Iraq, and Algeria.
3) Millions of British thermal units

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