

## **New Situation and Challenges Involving World's Downstream Oil Sector**

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On February 28, I had an opportunity to visit the headquarter of the Organization of Petroleum Exporting Countries in Vienna for an exchange of views with OPEC and Asian energy experts on future energy supply/demand and energy market trends. We had interesting discussions on a wide range of problems including the interpretation of world economic outlooks and other key assumptions involving energy supply and demand, major countries' oil supply and demand outlooks, challenges and prospects for shale gas development, and the Fukushima Daiichi Nuclear Power Plant accident's impact on Japan's energy supply and demand and on the fossil fuel market. Among problems to which I paid attention during the exchange of views was the new situation and challenges involving the world's downstream oil sector.

Among international oil market analyses, priority is frequently given to analyses from the macro viewpoint, focusing on the world economy and oil demand, non-OPEC production trends, OPEC production policy and geopolitical risks. Based on these issues, analyses on international crude oil price trends (including major benchmark crude oil prices) become a central topic. However, crude oil has value as far as it is refined into gasoline, kerosene, diesel oil and other final petroleum products to be used by final consumers. In this sense, analyses that cover not only the upstream sector including crude oil development and production but also the entire supply chain for refining crude oil into final products and providing them to consumers are indispensable. In this respect, I may be able to conclude that trends in the downstream sector, particularly the refining phase, include various and diverse moves to which we must pay attention.

First, we must pay attention to the features of the demand trends for petroleum products. This means that changes in demand for each petroleum product and relevant changes in the petroleum product demand mix, separated from increases and decreases in overall oil demand under economic trend changes, are more important when downstream problems are considered. Particularly, interesting changes have recently emerged in demand for gasoline and diesel oil. Demand for gasoline used as auto fuel has slackened on improvements in auto fuel efficiency. The change is remarkable particularly in the United States, the largest gasoline market in the world. U.S. gasoline demand has followed a downward trend. Diesel oil is used not only for passenger cars but

also for trucks for logistic services. Therefore, diesel demand is susceptible to economic trends. Diesel is also used for farming, power generation, industrial and other non-transportation purposes. Diesel demand has thus firmed mainly in developing countries. According to data from the International Energy Agency, oil demand in the member countries of the Organization for Economic Cooperation and Development in 2011 declined by 520,000 barrels per day from the previous year to 45.64 million bpd. While gasoline demand dropped by 390,000 bpd, diesel demand expanded by 30,000 bpd. In Asia that now drives world oil demand, middle distillates including diesel oil account the largest share of oil demand. Furthermore, the share is expanding. In the latest well known development, an increase in oil for power generation under electricity supply/demand adjustment measures in Japan has caused a remarkable change in the petroleum product demand mix. For the oil refining industry that refines a certain amount of crude oil into petroleum products, any change in the petroleum product demand mix is significant in respect to the operation of refineries, capital investment and crude oil choices.

Second, product quality standards have grown tougher globally, with cleaner products required, while petroleum product demand structure has changed. Industrial countries have taken the initiative and leadership in introducing tougher quality standards. But the introduction has spread throughout the world including developing countries. China and India have steadily introduced tougher European standards. As well as changes in the petroleum product demand mix, tougher product quality standards have become an important problem for the oil refining industry.

Third, various changes in the crude oil supply mix on the supply side are emerging for the oil refining industry in addition to those on the demand side. As production of existing crude oil grades is expected to peak out or decline, production and supply are likely to increase for various “new” liquid energy sources including unconventional oil as well as natural gas liquid increasing on the natural gas output expansion. The liquid energy supply mix (structure) is likely to change. No problem may arise on such changes as far as they match demand mix changes. But such matching cannot be guaranteed. Liquid energy supply mix changes have become a new challenge for the oil refining industry.

Under this situation, the business environment for the downstream sector including refining has been severe. In OECD countries where oil refining capacity surpluses have emerged, particularly, surplus capacity disposal has become a key challenge. Since 2011, refining capacity cuts and asset sales have expanded in Europe, which has been plagued with slumping demand under the economic crisis, and in the United States where gasoline demand has shrunk on improvements in auto fuel efficiency. On the other hand, the United States has substantially increased petroleum products exports to Latin American and other countries in the face of the domestic demand decline. In late 2011, nearly 3 million bpd in final petroleum products were exported, causing changes in the petroleum product flow.

Meanwhile, large-scale oil refining capacity expansion plans have been made in the Middle East and Asian emerging countries such as China and India, where overall oil demand is expected to increase. Such imbalance between regions has emerged along with the abovementioned three supply-demand imbalances, becoming a major challenge for the world's downstream oil sector.

As challenges and relevant responses in the downstream oil sector are expected to further change crude oil and petroleum product flow in the world and the business environment for the oil refining industry, the implementation of analyses on present information and future planning efforts based on such analyses may have great significance for the world's downstream oil sector including the relevant Japanese sector.

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