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Possibility and Impact of Accelerated U.S. Oil Output Expansion

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On April 7, the U.S. Energy Information Administration issued its Annual Energy Outlook 2014 (AEO 2014) forecasting long-term U.S. energy supply and demand. Last December 16, the EIA published an Early Release version of AEO 2014, just focusing on an overview of key findings. In giving the full report, the EIA interestingly began the first of its staged releases to take place from April 7 to 30.

Through the "staged release," the EIA offered to provide each part focusing on a specific topic. The full report's release will thus be completed on April 30. The first part that came out on April 7 focuses on long-term U.S. oil output expansion. The topic is very relevant and interesting at a time when the future course of U.S. oil and gas production under the shale boom has become one of the largest factors influencing the international energy situation.

Given that U.S. shale oil (light tight oil, or LTO) production expanded rapidly from less than 1 million barrels per day (mb/d) in 2010 to more than 3 mb/d in the second half of 2013, the EIA analysis provides the Reference case where LTO production will continue to expand before peaking at 4.8 mb/d in 2021 and being phased down later. (The Early Release version gave the similar projection.) But the analysis points out that the growth potential and sustainability of U.S. crude oil production hinge around uncertainties in key assumptions such as the geologic extent of the base for production, and technological improvement potential and speed, and that future production could change greatly depending on differences in the assumptions. Therefore, this analysis provides High and Low Oil and Gas Resource cases to examine the effects of alternate assumptions on U.S. oil production and imports and on international crude oil prices under a sensitivity analysis approach.

In the High Oil and Gas Resource case in which estimated ultimate recovery of shale gas, LTO and other unconventional resources will be 50% higher than in the Reference case, LTO production will continue expanding over a long time. The production peak is estimated at 8.5 mb/d and is expected to come in 2035, far later than 2021 projected in the Reference case. The LTO production expansion is projected to bring total U.S. oil output in 2035 up to some 13 mb/d, about 5 mb/d higher than the level (8 mb/d) projected in the Reference case.

Projected net oil imports into the United States also differ from case to case. The share of net imports in total U.S. liquid fuel consumption rose from 27% in 1985 to 60% in 2005 and fell to 40% in 2012 due to slack oil consumption and growing LTO production in recent years. In the EIA Reference case, the net import share is projected to fall to 25% in 2016 and then start to rise gradually (in line with a fall in oil output) to 32% in 2040. This means that the United States may fail to completely escape from its dependence on oil imports. In the High Oil and Gas Resource case, however, the net import share is projected to continue declining and reach about zero from around 2036. The United States is thus expected to achieve self-sufficiency in oil. The substantial U.S. oil output expansion and declining U.S. oil imports (the achievement of self-sufficiency in oil) are expected to exert downward pressure on crude oil prices in the international market. The Brent crude oil price in 2040 is predicted at $125 per barrel (a still high level) in 2012 dollars in the High Oil and Gas Resource case, far lower than $141 per barrel in the Reference case.

As a matter of course, the trend is reversed in the Low Oil and Gas Resource case. In this case, U.S. oil production is projected to peak at 9.1 mb/d in 2017 and decline to less than 7 mb/d in 2040. The share of net imports in total U.S. liquid fuel consumption is predicted to turn upward after falling to 27% in 2016 and rise back to 40% (close to the present level) in 2040. The Brent price in this case is expected to undergo upward pressure and reach $145 per barrel in 2040. Given uncertainties about the future course, it is not easy to accurately predict future developments. In this sense, the analysis of the High and Low Oil and Gas Resource cases depicting different pictures of the future may be useful.

The two cases' comparison with the Reference case indicates that the High Oil and Gas Resource case deviates from the Reference case far more than the Low Resource case does. If actual developments come closer to the High Resource case, we will enter a world far different from the “conventional wisdom” tells us now. Uncertainties surrounding the High Resource case may be interpreted as greater than those for the Low Resource case. This interesting High Resource case seems somewhat similar to the Enhanced Unconventional Resource Development (EURD) Scenario in our IEEJ's Asia/World Energy Outlook 2013 published in October 2013. The IEEJ's U.S. oil production projections in the EURD scenario in the United Sates and the rest of the world are close to the EIA projections for the High Resource case. The IEEJ scenario and the EIA High Resource case commonly indicate that the enhanced development of unconventional oil and gas resources would help ease the supply-demand balance and exert downward pressure on oil and gas prices.

The degree of how long and how strongly U.S. oil and gas production expansion would continue is likely to greatly influence the international energy supply-demand balance as well as individual economies and their industrial competiveness, as the degree can affect future development of energy price gaps between regions which is attracting global attention. In response to the recent tense Ukraine situation, the expansion of U.S. oil and gas supply is also attracting attention as a

factor influencing global energy geopolitics. We will have to keep close watch on policy discussions related to the U.S. energy situation.

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