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Natural Gas/LNG in a Decarbonization Trend

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In the first half of June, I had an opportunity to participate as a presenter in two webinars sponsored by famed U.S. think tanks. Both dealt with the impact of global decarbonization on natural gas and LNG. One was cosponsored by the Center on Global Energy Policy at the Columbia University School of International and Public Affairs and the Belfer Center for Science and International Affairs at the Harvard University Kennedy School to discuss the geopolitics of energy transition from the viewpoint of the impact on the natural gas market. The other was sponsored by the Atlantic Council and led by the Energy Futures Initiative to discuss a study on the roles of natural gas in global decarbonization. After the International Energy Agency released a report in May on a scenario for net-zero global greenhouse gas emissions in 2050 depicting the great impact on demand for and production of fossil fuels including natural gas, the two webinars attracted high interests with participants being conscious of the IEA report (see "A Japanese Perspective on the International Energy Landscape (533)" on how to read the IEA report).

Over more than a half century, natural gas supply and demand have expanded globally, smoothly, substantially and stably. According to BP statistics, global natural gas consumption increased six-fold from 1965 to 2019. The consumption volume increase during the period was the largest among energy resources, rivalling the oil consumption volume growth. Oil consumption has substantially increased but widely fluctuated around the oil crises. In contrast, natural gas consumption has increased almost persistently. Natural gas has differentiated itself from other fossil fuels and from non-fossil energy sources like hydro, nuclear and renewable energy by featuring substantial and stable consumption growth over a half century. Behind the remarkable consumption growth, natural gas has continued to be chosen as a clean fossil fuel in the world, supported by abundant resources and robust supply. We should pay attention not only to the substantial natural gas consumption expansion but also to a dramatic increase in international trade of natural gas while in the early days of the world natural gas market had been rather self-sufficient. International natural gas trade has been dominated by pipeline trade, but LNG trade has rapidly expanded in recent years and is now expected to grow dominant in the future.

After its extremely smooth expansion, however, the global natural gas and LNG market is now plagued with great uncertainties. Over the short term, natural gas consumption plunged under the great impact of the COVID-19 pandemic in 2020. The plunge, which has yet to be specified by the official statistics, might have been steeper than a 2% decline in 2009 amid the global financial crisis. Since early 2021, however, natural gas and LNG demand has got on a recovery path in line with a global economic rebound. The impact of the COVID-19 pandemic on natural gas and LNG was great but short-lived. In contrast, the decarbonization trend is expected to exert a greater impact on natural gas and LNG demand over the long term. If the world goes in the direction of carbon neutrality or net-zero emissions, an extremely great or dramatic impact is expected to arise on how to use natural gas and LNG, which is a fossil fuel though being cleaner than other fossil fuels.

The abovementioned IEA report estimates that global natural gas consumption in 2050 would decrease by some 60% from 139 exajoules in 2019 to 60 EJ including consumption with carbon capture, utilization and storage. However, the estimate represents one of various views. Even if the world reaches net-zero emissions, there would be various potential pathways and energy mixes. Nevertheless, we must take note of the possibility that a great impact could arise on natural gas demand in any net-zero emissions scenario.

Participants in the two webinars discussed how global natural gas and LNG consumption would change from the viewpoint of present realities, as well as the backcasting approach based on the goal of net-zero emissions by 2050. A particular view presented in the webinars was that natural gas and LNG demand would continue expanding over a considerably long term in Asian emerging market and developing economies that are expected to become the center of global energy demand growth and see a robust increase in natural gas and LNG demand. This is a traditionally mainstream view that may be described as conventional wisdom. However, it could be positioned as a view derived again from a reanalysis of natural gas and LNG demand for a world where the decarbonization trend would accelerate.

Asia as well will make an energy transition. The transition will be undoubtedly to a cleaner energy system seeking to reduce GHG emissions. Asia including China and India depends structurally on coal resources that are abundant and cheap. A transition from conventional coal consumption is one of the largest energy transition challenges in Asia. Then, a significant option would be the expansion of natural gas and LNG consumption. While energy efficiency improvements, renewable energy expansion and nuclear energy promotion are important, natural gas and LNG may play a key role in meeting growing energy demand in developing economies at affordable prices. The role of natural gas and LNG will remain important until or beyond 2040. The Asian situation after 2040 is more uncertain. It may be realistically difficult for Asian emerging market and developing economies to realize net-zero emissions by 2050 along with advanced economies including Japan, the United States and Europe. If they come closer to net-zero emissions, however, a great impact will be exerted on natural gas and LNG. If they position the net-zero emissions as a longer-term challenge and seek to reach the goal by 2070 or later, however, natural gas and LNG may remain important until the middle of this century.

Anyway, great changes and challenges will arise regarding Asian natural gas and LNG consumption. Even as natural gas and LNG remain important, however, more appropriate climate change countermeasures such as carbon-neutral LNG utilization and adequate measures to reduce methane and other GHG emissions through natural gas and LNG development will be required. Hydrogen/ammonia, methanation utilization and other innovative technologies or approaches will grow important. As future rulemaking for such initiatives is important, it will become significant to reflect opinions in Asia as a major natural gas and LNG user or player in such rulemaking. As the future of the global natural gas and LNG market becomes uncertain, it will become important to secure appropriate investment meeting future demand. As the future course is uncertain, natural gas and LNG market players in supply side may increasingly be limited to those who have financial capacity and low-cost supply sources for investment decisions. The market may thus be occupied by a small number of players in supply side. As oil majors and other international companies are exposed to decarbonization requirements and pressure in politics, society, financing and stock markets, they may be plagued with various challenges regarding fossil fuel business investment decisions. This could become an important matter to be considered. In this respect, a key issue would be how to position U.S. LNG that has offered diversity and flexibility as a new supply source for the international market in the past decade.

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