

Initiatives Moving in Europe for Decarbonization of Natural Gas

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In my previous column “A Japanese Perspective on the International Energy Landscape (418),” I pointed out that interest in and hopes on hydrogen are globally growing. I also noted that energy policy and industry stakeholders in Europe are growing interested in green hydrogen that is made from renewable energy and in blue hydrogen that is produced from fossil fuels with CO₂ being captured and stored with carbon capture and storage technology. I then cited a background factor that Europe has had initiatives to decarbonize natural gas as one of its mainstay energy sources. I here would like to further discuss the decarbonization of natural gas in Europe.

Natural gas decarbonization is related to ambitious long-term greenhouse gas emission reduction plans advocated by major European industrial countries. The United Kingdom plans to cut GHG emissions in 2050 by more than 80% from 1990, France by 75% and Germany by 80-95%. Cutting GHG emissions by more than 80% amounts to decarbonization rather than low-carbonization. These European countries are not necessarily committed to attaining these GHG emission reduction targets. Given that such large-scale emission cuts are required to achieve the Paris Agreement target of limiting the global average temperature rise to well below 2°C above pre-industrial levels, European industrial countries known for their aggressive attitude toward climate change countermeasures have voluntarily declared such ambitious emission reduction targets.

In this sense, it is difficult at present to determine whether such ambitious targets could be realized. In European industrial countries that have come up with these targets and vowed to take aggressive initiatives to prevent climate change, however, the emphasis in policy discussions is put on strong decarbonization initiatives. If GHG emissions were to be cut by more than 80%, energy consumption would have to be minimized through fundamental energy efficiency improvements, with energy consumption being decarbonized. The transformation of the power generation sector into a zero-emission sector, which has been a focus of discussions on emission cuts, is a “must” for decarbonization. The electrification of energy consumption on precondition of a zero-emission power generation sector is also important for overall decarbonization. However, the elimination of emissions in the power generation sector alone will not be enough. In all of transport, buildings and industry sectors, energy consumption will be required to be decarbonized.

Then, a challenge looming in Europe is the decarbonization of gas. Natural gas accounted for 24% of primary energy consumption in the European Union in 2017, serving as the second most important energy source after oil. While coal, which accounted for the third largest share of 13%, has been criticized for emitting massive GHG and remained under decarbonization pressure over a long time, natural gas known as the cleanest fossil fuel has also come under decarbonization pressure in Europe. To realize the abovementioned ambitious GHG emission cut, the world must choose to reduce natural gas and other fossil fuel consumption indefinitely or continue consuming fossil fuels

after their decarbonization. One decarbonization option is CCS technology to capture and store CO₂ emerging from fossil fuel consumption. Another option is to decarbonize fossil fuels before consumption. Various options or possibilities have become subject to consideration in Europe. It must be reiterated that decarbonization is indispensable for cutting GHG emissions by more than 80%.

Natural gas commanding 24% of EU primary energy consumption has been supported by international and domestic infrastructure and value chains that widely cover from the upstream sector to the midstream and downstream sectors. To continue using the existing infrastructure and value chains, which have been developed at massive costs over a long time, gas industry stakeholders have come under decarbonization pressure. Traditionally, natural gas has been viewed as a contributor to emission reduction through a switch from coal to gas and as an eco-friendly energy source making up for the intermittency of renewable energy. These views can be said as right and logical. As calls have grown for decarbonization across society in Europe, however, arguments taking natural gas as “just one of the fossil fuels” are exerting influence on the gas industry’s preparation for the future.

As options to decarbonize gas for consumption, the European gas industry has paid attention to (1) biogas produced from various kinds of biomass, (2) synthetic natural gas produced through the gasification of waste, (3) green hydrogen produced from renewable energy and (4) blue hydrogen produced from fossil fuels. In Europe, the endowment of relevant resources and existing infrastructure conditions differ widely from country to country. Therefore, priority options differ from country to country and from industry to industry, resulting in various initiatives. By demonstrating their serious initiatives for any of these options, the gas industry is trying to respond to European decarbonization in a strategic manner to survive in a future decarbonized society.

I would like to emphasize once again that these initiatives are required in a world where GHG emissions must be cut by more than 80%. Even European industrial countries have difficulties in determining whether and how they could realize or attain such ambitious GHG emission reduction targets. In efforts to suggest possible developments in a world of fundamental GHG emission reduction, however, we must pay much attention to the fate of gas decarbonization in Europe. This is because how the four gas decarbonization options would be realized would imply how the European gas industry would survive. The implication would be useful for the whole world.

Europe is pioneering gas decarbonization in the world. In many non-European countries, gas demand is expected to increase with priority given to the abovementioned switch from coal known for heavy GHG emissions to gas and other cleaner energy sources. They include Asian countries where gas demand is expected to substantially increase under economic growth. However, non-European countries cannot be indifferent to European gas decarbonization initiatives. The extent to which low-carbonization efforts would be enhanced remains uncertain along with prices and costs of energy sources competing with gas. At a time when there are various uncertainties about the future course of natural gas, the European case may be useful for considering future scenarios. If the European gas market goes in the direction of decarbonization, existing gas/LNG supply and international trade may have to become less dependent on Europe and more dependent on other regions including Asia. In this way, the Asian market may grow even more important for global gas/LNG suppliers. The sound development of the Asian gas/LNG market will become even more significant for the global gas industry. In this sense, I would like to keep close watch on Europe’s pioneering gas decarbonization.

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