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Future Energy System - Viewpoints of Decarbonization, Energy Security and Industry

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Abstract
Given the recent instability and the future uncertainty of the global situation, the future energy system needs to be restructured or even be reshuffled from a variety of viewpoints other than decarbonization. Though Japan and Taiwan, as being scarce in conventional energy and natural resources, need a certain amount of import of decarbonized energy such as hydrogen or its derivatives in the context of decarbonization, the development of domestic renewable energy and renewable hydrogen is also essential considering the potential risks of hydrogen import and the enhancement of energy security. Not taking the energy imports for granted, but it is quite important to address the possibility of what can be done domestically, such as larger deployment of renewable energy and recycling of critical materials.
Starting from renewable energy, the electrification of final demand should come first as being the most efficient option. At the same time, hydrogen should be prioritized for hard-to-abate applications. Based on the uncertain world situation, not only decarbonizing but constructing efficient and resilient energy system should also be discussed. Electrification, hydrogen and e-gas/fuels are the major options, and these options should be chosen for applications and delivery systems through careful assessment with deep discussions on how to establish future energy system and domestic industrial structure. Industrial policy should also be developed addressing circular economy based on critical minerals recycling that can contribute to the domestic economy.