

Reconsidering Energy Mix Issue in New International Energy Situation

Ken Koyama, PhD
Chief Economist, Managing Director
The Institute of Energy Economics, Japan

In the world pursuing carbon neutrality, the key point is what energy mix each country would seek to achieve carbon neutrality in accordance with its national conditions, energy resources endowment, technological capabilities and economic power. As the Glasgow Climate Pact was adopted at the 26th Conference of Parties to the United Nations Framework Convention on Climate Change, or COP26, to reaffirm the significance of limiting global warming to 1.5°C, each country is required to work out its energy mix goal and promote specific initiatives for realizing the goal to enhance decarbonization.

Meanwhile, some developments this year indicate that the stable energy supply is significant. As energy prices shot up simultaneously, major countries reaffirmed the significance of stabilizing energy markets and suppressing price hikes and implemented and enhanced relevant domestic and foreign policies. In a symbolic development, an unusual coordinated release of oil reserves led by the United States was announced on November 23. The development shows that how to secure energy as a strategic good for national life at stable, reasonable and affordable prices is a key policy challenge for emerging market and developing economies, as well as advanced economies.

Japan and other countries in the world will pursue energy policies and mixes to address the abovementioned challenge. Japan's sixth Strategic Energy Plan depicts an energy mix goal for 2030 while falling short of specifying a goal for 2050. Initiatives to realize the 2030 energy mix goal and develop and achieve a 2050 energy mix goal are central future energy policy challenges.

In considering the energy mix issue, we must pay attention to present changes in the international energy situation and subsequent energy mix policy revisions. The biggest recent matters of interest to me include a potential change in Europe. As noted in A Japanese Perspective on the International Energy Landscape (556), European Commission President Ursula von der Leyen on October 22 said that the European Union would need nuclear as a stable energy source and natural gas as a transitional source while giving top priority to the promotion of renewables. She was discussing the energy price hikes and the future EU energy mix. In a manner to respond to the remark, French President Emmanuel Macron offered France's resumption of new nuclear power plant construction in his country on November 9 amid COP26. East European countries are giving priority to nuclear in considering enhancing climate change and energy security measures. Specific initiatives to develop small modular reactors and other innovative nuclear power generation technologies as future options are seen in some countries including Canada and the United States.

In Japan, nuclear energy issues have become politically and socially difficult and sensitive due to the 2011 Fukushima Daiichi nuclear power station accident. In such situation, Japan has been plagued with various challenges regarding the restart of existing nuclear power plants, the extension

of their service lives, their replacement, new plant construction and the nuclear fuel cycle. Toward the realization of the 2030 energy mix goal and the development of the 2050 goal, Japan will be required to closely watch the global situation regarding nuclear energy and promote domestic nuclear energy policy discussions to restore the social acceptability of nuclear plants under nuclear regulations that simultaneously pursue safety and efficiency.

Natural gas as a transitional energy source, as given in the von der Leyen remark, is the key to considering the energy mix issue in Japan and Asia, as well as in Europe. The energy transition to decarbonization will take a long time. Advanced economies' goal of decarbonization in 2050 indicates that the energy transition will take at least 30 years or a longer time depending on future conditions. Given realities in developing economies, the transitional period would be far longer. How to secure stable supply of not only natural gas and liquefied natural gas but also oil and coal during the transitional period while seeking to achieve energy mix goals may remain an extremely important issue for Japan and the world. Investment to secure their stable supply will be required. Europe, the Americas, Asia and Japan should pay attention to the reality and share the recognition that adequate investment is required.

The decarbonization of fossil fuels is another important viewpoint for positioning fossil fuels including natural gas and LNG as well as oil and coal in a future energy mix. As noted in the IEEJ Outlook 2022, the flagship product of the Institute of Energy Economics, Japan, the world could substantially reduce CO₂ emissions and continue to use fossil fuels by promoting the decarbonization of fossil fuels and the use of blue hydrogen and ammonia. There are numerous technological, economic and social challenges to overcome for the promotion. A long-term strategic energy challenge is to develop international supply chains for CO₂-free hydrogen and include such hydrogen into each country's energy mix. Technological advancement and cost cuts are indispensable for resolving the challenge and should be considered along with how to secure necessary infrastructure investment and how to price CO₂.

Regarding the decarbonization of fossil fuels, the position of coal in the energy mix is important. The COP26 pact called for phasing down unabated coal power, but European and U.S. pressure on Asia and Japan to shift from the coal phasedown to a phaseout may grow in the future. Then, it may be important for Asia and Japan to depict and demonstrate to the world a future energy mix picture to substantially reduce CO₂ emissions while mixing CO₂-free ammonia with coal for power generation.

While blue hydrogen from fossil fuels and green hydrogen from renewable energy are attracting global attention regarding the use of CO₂-free hydrogen or ammonia, yellow hydrogen using nuclear power generation may also be conceivable. These hydrogen options' economic efficiency and environmental effects should be analyzed to allow CO₂-free hydrogen to be included into an energy mix that meets the characteristics of each country or actor.

As a matter of course, it will be important for Japan and the world to promote renewable energy such as solar and wind power as much as possible and position renewables as a major component of a power generation mix. Global hopes are placed on renewables that feature falling power generation costs, domestic availability and the absence of CO₂ emissions. At the same time, electricity storage systems and backup power sources will grow important for preparing for cold waves, long windless periods and other natural phenomena that would destabilize solar and wind power generation. How to hold down costs for these measures to integrate renewables into the

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electricity system is the key to promoting renewables and depicting a future energy mix picture. Initiatives to develop and realize energy mixes based on the latest energy situation and policy challenges will remain important.

Contact: report@tky.iecej.or.jp

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