

## **How to Respond to Increasingly Diverse and Complex Energy Security Risks**

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Energy is an indispensable commodity for day-to-day life, economic activities, and even state management. Energy security to ensure a sufficient and stable energy supply at affordable or reasonable prices is the most important and fundamental requirement in energy policy for all countries. In reality, however, the energy supply and demand structure differs widely by country. Some countries are rich in resources and export energy, while others import energy. Resources endowment varies by country. Some countries, including Japan, rely heavily on energy imports from overseas. By nature, the international energy market is greatly influenced by international political and geopolitical conditions. Daily energy trade and transactions, which depend on the sound and stable operation of huge global supply chains, are always exposed to the influence of various factors.

Therefore, energy security has always been fraught with various challenges. Energy crises, which represent energy supply in extremely serious situations, have frequently occurred in the international energy market, shaking the world. In the latest crisis, Russia's invasion of Ukraine in 2022 triggered a sudden destabilization of the international energy market, causing unprecedented energy price hikes and significant supply instability, especially in the European market. The crisis has become an extremely serious problem for the whole world.

The reason why energy crises shake the world is that they have two important impacts: physical shortages and price hikes. The two may interact, or either may appear alone. Although physical shortages are always accompanied by price hikes, price hikes may occur even without a real physical shortage. Because energy is an indispensable commodity, both impacts can be enormous. However, physical shortages may be more serious than price hikes. In some cases, a physical shortage of energy as an indispensable commodity may interfere with the most basic and important requirements such as life, safety, and health. In the long history of the international energy market, physical shortages have rarely occurred in reality. Physical shortages are extremely infrequent. Once a physical shortage occurs or is feared to occur, however, the impact may be enormous. In the midst of the Ukraine crisis, gas prices in Europe soared to unusually high levels, close to \$600 per barrel of crude oil equivalent, driven by concern that gas would not be available in winter (that there would be physical shortages).

Another important perspective for considering the issue of energy security is that the world is exposed to potential risk factors that threaten energy security. They are only potential risk factors, meaning that only when risk factors are realized, energy security may actually be threatened. In this regard, it can be said that today's international energy market faces a wide variety of risk factors that have the potential to be realized. As discussed in my essay "A Japanese Perspective on the International Energy Landscape (340)", various risk factors for energy security can be roughly divided into emergency and contingency risks and structural ones.

The emergency and contingency risks mean that risk events may come as emergencies suddenly or accidentally. Typical examples include (1) energy supply disruptions through events such as war and revolution, (2) energy supply disruptions through accidents or natural disasters that hit supply chains, and (3) market disruptions through panicked consumer behavior. Cyberattack-caused energy supply disruptions, which are included in the second category, are important as a risk factor today.

In contrast, structural risks cause problems over a certain period of time. Typical examples include (1) a structural supply-demand crunch in which supply cannot keep up with demand for some reason, (2) market domination by powerful suppliers, (3) resource constraints or depletion, and (4) supply constraints as a side effect of policy changes, environmental regulations, and market liberalization. Both emergency/contingency and structural risks have often been seen to exist, materialize, and exert a significant influence on the international energy market.

The problem is that there have been various risks that fall under these categories in the international energy market up to the most recent time and are likely to materialize in the future. With regard to emergency/contingency risks, I would like to begin with geopolitical risks related to the first category. The destabilization of the Middle East situation through the emergence and escalation of Iran-Israel confrontation, which suddenly attracted global attention in April, as well as its impact on oil supply, remains an important issue that could affect international energy security. Also attracting attention is the impact of the Ukraine-Russia war, which has been prolonged and stalemated with both sides intensifying attacks on energy-related infrastructure. In addition, we must keep an eye on the impact of East Asian geopolitical risks regarding China-Taiwan relations after the inauguration of a new administration in Taiwan, the Taiwan Strait issue, and the North Korea situation.

Accident and natural disaster risks in the second category, though difficult to predict, came frequently in the past few years, including the suspension of liquefied natural gas shipments due to a fire at the U.S. Freeport LNG export terminal, the adverse effects of extreme heat and drought on electricity supply in Europe amid the Ukraine crisis, and the electricity supply-demand crunch amid cold waves in the United States. In addition, the world witnessed an extraordinary surge in spot LNG prices and market turmoil amid European companies' frantic buying of LNG during the Ukraine crisis. These risk factors, including potential cyberattacks, are real and have the potential to materialize at once in an unpredictable way.

With regard to the first category of structural risks, I would like to point out that there is concern that the supply-demand balance for fossil fuels, which are expected to play an important role in the immediate future and for a considerable period of time, may tighten due to underinvestment that may occur as energy transition progresses. As for the second category, grave energy and economic security issues include the world's high dependence on limited supply sources for critical minerals for which the supply-demand balance is expected to tighten amid the promotion of the energy transition, as well as oil supply and demand adjustment by OPEC-plus and other oil-producing countries and its impact on crude oil prices that have attracted global attention. Regarding critical minerals, there is also concern that the issue of resource constraints in the third category will emerge in some cases. Under these circumstances, it is necessary to pay attention to the rise of resource nationalism, resource enclosure, and the growing power of resource-rich countries. With regard to the fourth category, it is noteworthy that challenges include the energy market's growing vulnerability to surplus capacity declines amid market liberalization and difficulties for new investment and long-term contracts.

In light of the abovementioned situation, it is necessary to carefully examine realities,

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potential future developments, and the impacts of events regarding a wide variety of complex risk factors and consider comprehensive measures based on the examination, as well as priority and balance.

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