Special Bulletin

A Japanese Perspective on the International Energy Landscape (662) November 10, 2023

Considering the Issues Related to the Costs of Energy Transition

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The energy transition requires the cost of reforming the energy supply and demand structure itself and the entire social energy infrastructure into what is significantly different from the current ones and transforming society as a whole. It is easy to imagine that the costs involved in all transitions, including social infrastructure transformation, will be enormous.

It is sometimes argued that the energy transition will not cost so much because technological innovation is expected to reduce costs for new technologies. However, I do not subscribe to such an argument. This is because I believe that transforming the entire energy system will require a huge investment that will inevitably cost a lot of money.

If we go back to the very basics and think about why the energy supply and demand structure that currently exists in the world and the infrastructure that supports it have been developed, one clear fact emerges. The fact is that the current system is a combination of choices and decisions made by various actors to basically select the most cost-competitive, accessible, and convenient system.

In today's world, fossil fuels account for more than 80% of primary energy supply. The main reason for this reality is that fossil fuels have been the best energy source in terms of cost competitiveness, accessibility, and convenience, making it a natural choice to use them. Of course, there have been huge changes in resource allocation and development among fossil fuels, such as a major shift in energy consumption from coal to oil. When we look at fossil fuels as a whole, however, the reality is that they are where they are today because they are highly competitive, supported by huge supply chains and infrastructure that stretch across the globe and make them competitive.

Given this current situation, a fundamental change in the energy supply and demand structure inevitably means that we will deviate from the system that has been considered the most competitive and selected to date. Why should we change the supply-demand structure despite such deviation? The answer is that we decide to intentionally try to reform the current situation to solve a problem that cannot be solved if it is left to natural selection. In order to enhance energy security and prevent climate change, the choice is made to transform the current system, leading to the promotion of energy transition.

Both energy security and climate change issues are the externalities to the market. They cannot be expected to be solved simply if they are left to market forces alone that select the most cost-competitive option. In the past 50 years, the world has experienced two global energy crises. The first was the oil crisis 50 years ago. An important factor behind the crisis was the world’s excessive dependence on Middle Eastern oil. The second is the Ukraine crisis since last year, which has been caused by Europe’s excessive dependence on Russian energy sources. The precise reason for the excessive dependence is that Middle Eastern oil or Russian energy sources are highly competitive. In

the face of the oil and Ukraine crises, countries around the world promoted energy security policies even at high costs. Although coal is the most cost-competitive energy source in many cases, developed countries have taken leadership in phasing out coal consumption through a transition to cleaner energy sources due to concerns about CO_2 emissions from coal consumption that contribute to climate change. However, the coal phaseout is not an easy choice for countries that depend heavily on coal, including emerging and developing countries known for their relatively lower income levels. This is especially true after the Ukraine crisis caused a surge in energy prices and made it important to secure inexpensive energy sources as much as possible.

Since the Ukraine crisis turned around the international energy situation, however, balancing energy security enhancement with decarbonization has become an important energy policy challenge. The promotion of energy transition to strike a balance between energy security enhancement and decarbonization has become a top priority challenge regarding energy for the future world. After the upheaval of the Ukraine crisis, however, I feel that the balancing has become more complex and difficult than ever. This is because society's sensitivity to and tolerance of rising costs associated with the energy transition have changed, making it more uncertain whether society can easily accept such cost increases even while understanding the necessity of energy transition.

One major trend or change regarding uncertainty can be seen in the introduction of energy subsidies in developed countries. Since October 2021, energy subsidies in the European Union have prompted Japan to introduce an energy-related subsidy system. Earlier, energy subsidies had been difficult to think about in developed countries, although they had been found in developing countries. In consideration of the importance of energy and the regressive effects of soaring energy prices, however, developed countries have concluded that it is politically, socially, and economically impossible to overlook energy price hikes. Society has become more sensitive to rising energy prices and costs.

Furthermore, Europe has recently made moves to postpone the implementation of decarbonization enhancement policies, such as a ban on sales of new internal combustion engine vehicles and the regulation or prohibition of boilers. There have been cases where new auctions mainly for wind power generation projects end up unsuccessful in the absence of bids. While there may be various factors behind these developments, Europe's economic hardship and difficulties have led to a more cautious attitude toward policies or initiatives that could lead to higher energy costs.

Even under these new social conditions, it is necessary to promote an energy transition that aims to promote both energy security and decarbonization. One of the keys to their successful promotion is how to minimize or control a rise in costs required for energy transition. Of course, technological development and relevant cost cuts are important for this purpose. At the same time, however, it is important to take into account differences in national circumstances, energy resource endowments, and energy supply and demand structures, recognize various energy transition pathways, and adopt optimal methods or approaches that suit each country. It is unlikely that some countries' moves to impose only one pathway on others in a top-down manner will produce constructive or effective results.

When the world promotes initiatives to maximize global interests such as the prevention of climate change even amid deepening global divisions, the recognition of various pathways to the energy transition is important for minimizing cost hikes and enhancing international cooperation and collaboration beyond divisions. While priority has been given to the principle of "common but

differentiated responsibilities" in the prevention of climate change, I think that the recognition of "various pathways" is becoming a new important principle in the current international situation.

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