

Reconsidering the Significance of Long-term Energy Outlook based on the discussion in Europe/U.S.

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

From January 20 to 24, I visited Paris and Washington and gave presentations at the Paris-based International Energy Agency (IEA) in Paris and at the Washington-based Center for Strategic and International Studies (CSIS) on the IEEJ Outlook 2025, a long-term global energy outlook by the Institute of Energy Economics, Japan. I had opportunities to exchange opinions with the participants in the above-mentioned meetings for my presentations. At the IEA, about 30 IEA executives participated in the presentation meeting. At the CSIS conference, a total of more than 500 participants gathered on a face-to-face or online basis. I thus hope the presentations and the discussion were meaningful.

Since its publication in October last year, the IEEJ has conducted presentations on the Outlook in Japan and other countries. Overseas, I have made presentations and discussions on the Outlook at the Secretariat of the Organization of the Petroleum Exporting Countries, the London Office of the Japan External Trade Organization, and the Center for Global Energy Policy at Columbia University in the United States. As uncertainty about the future international energy situation increases and makes it more difficult to predict the future, interest in the long-term energy outlook is actually growing worldwide. I feel that the fact that our think tank in Japan continues to independently analyze and disseminate the future vision of the world's energy every year is attracting attention around the world. Of course, there is growing interest in its content and characteristics.

For the content and characteristics of this Outlook, please refer to my essay "A Japanese Perspective on the International Energy Landscape (711)." What left a particular impression on me through my discussion in Europe and the United States this time was the significant concept for our analysis of the future vision of energy in the world. This Outlook depicts how global energy supply and demand will change toward 2050 under two scenarios, the "Reference Scenario" and the "Advanced Technologies Scenario." These two scenarios are analyzed annually as a regular exercise. They represent forecasts that are based on ongoing trends and various assumptions for the future. In this respect, I would like to emphasize the important point that we regularly review these future assumptions in light of changes that are actually taking place in the world.

With regard to the assumptions, IEEJ experts in various fields make expert judgments based on their information gathering and analysis. Such judgments are influenced by what is happening, about to happen, or even expected to happen in the future. For example, assumptions regarding the pace of renewable energy penetration, the speed of progress in energy efficiency improvement, and the degree of electric vehicle penetration may change every year. Therefore, the Reference and Advanced Technologies Scenarios in the current Outlook may differ from those in the previous annual Outlook. Expert Judgments on assumptions may affect forecasts.

The basic concept of the Reference Scenario is that the current trends will be sustained,

representing an image of a “business as usual” future. Here, how to judge the current trends is important. The basic concept of the Advanced Technologies Scenario is that advanced energy technologies will be introduced to the maximum extent possible in order to strengthen measures to address climate change and energy security. The key here is to make a judgment to the maximum extent possible. Anyway, however, the Outlook depicts how the world will change under the judgment of important assumptions for looking into the future.

This forecasting analysis has the advantage of being able to objectively show how the world will change under specific assumptions. Depending on how the assumptions are placed, it is suitable for drawing a future image based on the sense of reality. On the other hand, this forecasting approach has difficulties in covering discontinuous or innovative changes. This is because it is difficult to take into account discontinuous changes when judging assumptions. In the past, there have been dramatic technological advances in the international energy market that have significantly changed the future, as well as innovations that have been realized at a speed and degree that has far exceeded expectations. They include the discovery and expansion of the Middle East's vast and low-cost oil resources, the rapid spread of internal combustion engine vehicles, and the progress of the U.S. shale revolution.

Contrasting with the forecasting analysis is a backcasting analysis. The Net Zero Emissions (NZE) Scenario in the IEA's World Energy Outlook known as the world's most authoritative long-term energy outlook is the most prominent representative backcasting analysis. The backcasting analysis of NZE scenario is a normative analysis that first sets the goal for the world to achieve net zero GHG emissions by 2050 and indicates how the world must change in order to reach the goal. Its strength is that it can show how far the goal deviates from the present status and what should be implemented to fill the deviation. The backcasting analysis can provide policymakers and decision-makers with the path and milestones to a goal. It can also overcome the forecasting analysis's difficulties in covering discontinuous and innovative changes. On the other hand, the weakness of the backcasting analysis is that if the deviation between the goal and reality becomes excessively large, the adequacy and feasibility of the analysis may be impaired. Its other weakness is that the analysis, though designed to indicate a path to a goal, may be misunderstood as an “outlook” and mislead decision making.

The forecasting and backcasting analyses have their respective advantages and weaknesses and are useful for envisioning the future of energy and considering energy policy measures. The important point is that policymakers and decision-makers should understand the advantages and weaknesses of both analyses and use them correctly and adequately. What we must avoid is failing to understand the weaknesses of each of them or daring to ignore any weaknesses and fall into error.

It is becoming increasingly difficult to predict the energy situation in Japan and the rest of the world. As geopolitical risks are growing, cyber risks and other new threats to energy security are emerging in addition to traditional risk factors. A new information revolution is progressing rapidly, leading to a new challenge of rising electricity demand that could not be imagined in the past. While the enhancement of decarbonization efforts is urgently required amidst climate change's serious effects, the enhancement leads to energy cost hikes that affect livelihoods and economies, exerting significant effects on elections and political decisions. Industrial policy, though being enforced strongly to promote innovation indispensable for energy transition, is feared to intensify competition between nations. The issue of economic security related to strategic materials required for innovation and clean energy investment has come to the fore and become more difficult due to the deepening division of the world. The just inaugurated second Trump administration in the United States is exerting diverse and complex impacts on all of these challenges. In this complex, difficult situation, a long-term outlook based on objective and scientific analysis is important for making appropriate decisions for the future.

In the face of these difficult challenges, we have strongly recognized that we should accumulate studies further and conduct better analyses to contribute to the world.

Contact: report@tky.ieej.or.jp

The back issues are available at the following URL.

http://eneken.ieej.or.jp/en/special_bulletin.html