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Is Hydrocarbon the Enemy or Ally to Climate Change Countermeasures?

－What Should We Consider When Measures to Achieve Zero Emission Status are Key Factors?－

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Introduction

The focus of climate change policies is shifting from short to medium-term approaches to initiatives based on long-term targets. This has been indicated by the long-term target put into the Paris Agreement, requests for national strategies, high evaluation of the special report by the Intergovernmental Panel on Climate Change (IPCC), the United Nations' requests for each country's zero-emission initiatives, growing international opinion for the significance of long-term targets, and European, Chinese, and other offers to enhance initiatives to achieve specific long-term targets. As it is widely shared that substantial transition from existing systems and technological innovations would be indispensable for realizing a zero-emission society, desirable or potential future pictures of energy supply and demand and other sectors are being considered. The problem is what specific actions would be required to achieve zero emissions. Various views are identified about what energy would be required to realize decarbonization, whether fossil fuels should be restricted or used jointly with decarbonization technologies, and other questions about future pictures. If 2050 is set as the target year for achieving zero-carbon status, 30 years are left. What actions would be feasible to achieve zero-carbon status within 30 years should now be considered along with relevant economic and social impacts.

This paper discusses what zero-emission actions should be considered now, while touching on recent international trends regarding zero-emission actions and referring to views given by foreign experts at the International Energy Symposium[1] sponsored by the Institute of Energy Economics, Japan (IEEJ), and the Asia Pacific Energy Research Center (APERC) in September 2020.

Climate Change Policy Trends under COVID-19

While the COVID-19 pandemic is spreading throughout the world, major economies are considering how best to promote long-term initiatives to reduce greenhouse gas emissions. As the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change,

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[1] 5th IEEJ/APERC International Energy Symposium: "Energy Trilemma in the Post-Corona world -- Can Innovation and Soft Power be the Solutions?" September 18, 2020
https://eneken.ieej.or.jp/whatsnew_op/200918jointsympo.html

known as COP26, has been postponed until late 2021, the current situation is feared to lead priority to be lowered for climate change policies. Given growing discussions on Green Recovery initiatives to take advantage of climate change countermeasures for economic recovery, however, we see a momentum for promoting climate change countermeasures. These initiatives can be seen as moves designed to combine sustainable economic growth with environmental conservation using funds for climate change countermeasures, which may produce win-win effects. Such initiatives may be sustained for the immediate future.

Zero-emission Targets

On September 22, Chinese President Xi Jinping in his general speech at the United Nations stated that China would try to lead CO_2 emissions to peak by 2030 and achieve carbon neutral status by 2060, sending a strong message to the international community. The European Union is in final talks to agree on the enhancement of its 2030 emission reduction target and on the 2050 zero-emission target, acting as a driver of global moves towards zero emissions. After his inauguration, U.S. President-elect Joe Biden is expected to take procedures for the United States' comeback to the Paris Agreement and promote initiatives to implement campaign promises to (1) cut GHG emissions to zero in the United States by 2050, (2) achieve net zero GHG emissions in the power sector by 2035, and (3) invest $2 trillion (about JPY210 trillion) in four years to create jobs and achieve environmental justice. Japan's Prime Minister Yoshihide Suga in his policy address declared that Japan would cut GHG emissions to zero by 2050 or achieve carbon neutral status or a decarbonized society in 2050. Major economies are seemingly keeping step with each other in trying to achieve zero-emission status in 2050.

Zero-emission Actions and Fossil Fuels

While major economies declare decarbonization targets, specific energy choices to achieve a zero-emission society are attracting attention. Fossil fuels such as oil, coal, and gas supported global economic growth from the 19th century to the 20th century and still account for more than 80% of global primary energy consumption (as of 2018) even at a time when climate change policies are viewed as important. Given an assumption that the world's dependence on fossil fuels in 2050 will decrease only slightly from 2018 if present energy technologies and relevant policies are maintained with population growing in emerging market and developing economies, the world will have to break away from the past trends to achieve zero-emission status[2].

Given such situation, the second session of the IEEJ/APERC International Energy Symposium discussed how to handle fossil fuels in zero-emission actions under the title "Is Hydrocarbon the Enemy or Ally to Climate Change Countermeasures?" Foreign experts agree that each country should improve energy efficiency and promote renewable and low-carbon energies while

[2] Institute of Energy Economics, Japan, "IEEJ Outlook 2021－Energy Transition in the Post Corona World," 436th Forum on Research Work, October 16, 2020

recognizing that energy supply and demand conditions differ by country. Particularly important technologies in this respect include hydrogen, carbon capture, utilization, and storage (CCUS), bioenergy, and batteries. Initiatives to decarbonize and utilize existing infrastructure are also indispensable. While technology combinations and needs differ by region or country, all potential technologies should be mobilized to realize net zero-emission status. Regarding renewable energy that is expected to play a central role in decarbonization, fossil fuels should be used for energy system supply chains to some extent from the viewpoint of economic efficiency for the energy system. The so-called Circular Carbon Economy (CCE) approach to manage carbon emissions from the global energy mix has been suggested along with the 4Rs (Reduce, Reuse, Recycle, and Remove) approach that seeks to introduce a mechanism for assessing all decarbonization options from the 4Rs viewpoint and build a decarbonized society combining CCUS with fossil fuel use.

While it is generally pointed out that it is important to transition from fossil fuels to renewable energy and other zero-emission resources to achieve decarbonization, the feasibility of a decarbonization path in which fossil fuels would be used along with technologies that capture and/or utilize CO_2 such as CCUS is expected to be discussed for future zero-emission initiatives.

Japan's long-term strategy

At a meeting of the Growth Strategy Council on December 1, 2020, Japan compiled a draft growth strategy action plan[3] that gives specific initiatives of a growth strategy designed for recovering from the COVID-19 disaster. After Prime Minister Suga declared the 2050 zero-emission status target in his policy address in October 2020, the draft action plan includes a green growth strategy towards the 2050 carbon neutral status. It calls for considering specific fiscal and tax measures to support private enterprises to develop innovative technologies under national projects and for formulating a draft plan including specific target years for green initiatives within 2020.

Regarding technological development, the draft plan recognizes that existing technologies alone would not be enough to achieve carbon neutral status by 2050 and that innovative technology development would be indispensable. It identifies three priority technology areas – (1) electricity and green electricity (next-generation storage batteries, etc.), (2) hydrogen (technologies for massive hydrogen supply to decarbonize the heat and power sectors and for hydrogen use), (3) CO_2 capture and recycling (carbon recycling, biomass power generation with CO_2 capture/storage technology, etc.) and calls for enhancing government support for technological development. The draft action plan also indicates the directions of specific initiatives for hydrogen, automobile batteries, carbon recycling, offshore wind power generation, semiconductors, and information and communication technologies that are indispensable for achieving carbon neutral status, seeking to expand government-wide initiatives. It also suggests that relevant government organizations be united to formulate action plans for aircraft and ships, nuclear, solar photovoltaics, logistic systems, lifestyles, and other areas where the virtuous cycle of economy and environment is expected.

[3] https://www.cas.go.jp/jp/seisaku/seicho/pdf/jikkoukeikaku_set.pdf

In this way, the Japanese government has indicated an attitude of adopting European and other strategies to promote zero-emission actions as part of measures to recover from the COVID-19 disaster. Specific zero-emission actions include not only the further diffusion of renewable energy, energy efficiency improvement, and other existing technologies but also the utilization of all future technologies such as hydrogen and carbon recycling. This basic approach will be reflected in the new Strategic Energy Plan and the Global Warming Countermeasure Plan to be formulated in the future.

Conclusion

At a time when countries in the world are urgently required to take measures to recover from the COVID-19 disaster, Europe and Japan demonstrate an attitude of promoting funding for zero-emission technologies to resolve both economic and environmental challenges. Given that the United States is expected to consider a similar attitude under new President Biden from 2021, the international community is likely to sustain zero-emission actions. As it is difficult for existing technologies alone to achieve a zero-emission society, the feasibility of all potential technologies may be tested in the future. Particularly, major countries will consider their technology strategies meeting their respective conditions from the viewpoint of securing their industries' international competitiveness.

When global zero-emission status is considered, we must recognize that zero-emission technologies developed by competent major countries should be spread to other countries including developing economies. While the COVID-19 pandemic is assessed as leading the international community to be divided into blocs, international collaboration and cooperation may be indispensable for realizing global zero-emission status. At the abovementioned IEEJ/APERC international symposium, participants indicated that each country should advocate long-term policies to pave the way for enterprises to easily implement investment in zero-emission actions, that all countries in various conditions regarding fossil fuels should cooperate and share best practices, and that it is important whether the world could have a disciplined manner to transition to a decarbonized society benefitting the global economy.

While major countries are now considering actions to promote all potential technological innovations to achieve zero-emission status, it is expected that the international community develop a path to zero-emission status through cooperation.

Writer's Profile

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Mr. Kudo has served as ISO/TC207/SC7/WG5 (ISO 14064-2: Guidance for the GHG project) Convener, ISO/TC17(Steel)/WG24(ISO 20915) Convener (Life Cycle Inventory Calculation Methodology for steel products), and a committee member/working group members related to climate change policy (including emissions trading scheme) and renewable energy policy organized by central and local governments. Former UNFCCC, The Joint Implementation Supervisory Committee (JISC) member. He is an expert in Global Warming, Energy Conservation and Renewable Energy Policy, Standardization for GHG related activities and Sustainable Finance (ISO).