

Report by the Expert Panel on Climate Change

Introduction

In October 2020, Japan formally declared to achieve net-zero by 2050, unveiling a policy of proactively tackling global warming in ways that will bring transformation of industrial structures as well as economy and society, leading to economic growth. Then in April 2021, Japan has also set a new target to reduce greenhouse gas emissions by 46 percent in fiscal year 2030 from its fiscal 2013 levels. Furthermore, Japan expressed its intention to continue strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by 50 percent, and decided to demonstrate its leadership for world-wide decarbonization that will meet Japan's responsibility to future generations.

Today we stand at a crucial turning point in human history. While nations around the world are moving to boost their climate policy measures, the government's decision is a momentous commitment for Japan's economy and society. The path on the way to realizing this commitment is by no means smooth, nor are there firm solutions; but the problem will need to be engaged with strong resolve. David Brower, a leading light in building the environmental movement, used to say, "There is no business to be done on a dead planet"; but on a dead planet, there is no hope even for life itself.

2030 is less than a decade away. This will be a decisive decade as to whether net-zero can be achieved by 2050.

- *As major social trends are formed, people come to prefer new lifestyles from shared concerns.*
- *As industrial structures are changed, corporations oriented to symbiosis with the environment gain favor with investors and consumers, becoming profitable.*

To transition to such a socio-economic system as quickly as possible, the government must mount a united effort across a broad range of fields, involving public and private sectors.

This report summarizes the thinking of the Expert Panel, based on the above awareness of issues, regarding the vision and approach by the Japanese government in undertaking initiatives to achieve the 2030 and 2050 targets.

Recent years have seen a spate of reports on the results of scientific research on climate change policy measures. In the United Kingdom, the Climate Change Committee was established as an independent body from the government to provide scientific analysis and check the progress of initiatives. Considering such examples, we would hope that the wisdom of scientists and other experts is continually drawn on and reflected in policies also in Japan.

1. Why Aim for Net-Zero?

(1) The necessity of “sustainable activities on the Earth” as an common issue for all humanity

Ever since the industrial revolution, human beings have been achieving dramatic economic growth through industrialization, making use of large quantities of fossil fuels; but it has also imposed an enormous burden on the global environment. The scale of this impact goes well beyond the history of any one nation or of humankind, extending to the history (geological eras) of the Earth, such that a new era division called the Anthropocene has even been proposed. It is feared that when human activities grow beyond a certain tipping point, the changes to the Earth will be irreversible. Climate change caused by the increasing concentration of atmospheric greenhouse gas is thus a problem shared by all of humanity.

With the rise of mean temperatures, in global, changes in the frequency of heat waves, melting of snow and ice, and sea level rises have been observed. In Japan, as well, rising mean temperatures, changes in the frequency of heavy precipitation, and adverse effects on agricultural products and on the ecosystem have been observed. There are predictions that if climate change proceeds, we face the possibility of further natural disasters along with ecosystem loss and enormous impacts on food security and in areas such as poverty and health.

In August 2021, the Working Group I report to the Sixth Assessment Report (AR6) by the Intergovernmental Panel on Climate Change (IPCC) was released. Here the assessment is reached for the first time that “it is unequivocal that human influence has warmed the atmosphere, ocean and land.” The report states that human-induced climate change is affecting frequency and intensity of weather and climate extremes such as heat waves, heavy precipitation, and droughts throughout the globe, but also that if the rise in temperature is limited to 1.5°C rather than reaching 2°C, climate change impacts can be significantly minimized.

Maintaining a desirable global environment and passing it to future generations is the responsibility of the present generation. The Earth is the precious asset of all of humanity. Passing it on to future generations will require confining human activity inside the planetary boundary. Japan Aerospace Exploration Agency (JAXA) astronaut Kimiya Yui, after returning from the International Space Station (ISS), said he was surprised by how thin the Earth’s atmosphere looked from outer space. If the concentration of atmospheric greenhouse

gas continues to rise, the tipping point may be exceeded. We do not have the luxury of simply sitting on our hands.

(2) Changes in corporate activities with rising global awareness of climate change

More than 130 nations, together accounting for around 40% of global CO₂ emissions, have committed to achieving net-zero by 2050. Since 2019, moves in Europe toward achieving the 2050 goal have become substantial, while the EU and United Kingdom have set ambitious targets also for 2030. In the United States, the inauguration of the new President in 2021 meant a change to a more active stance toward climate change, so that the goal of net-zero by 2050 and ambitious reduction targets for 2030 have been set. Moves by developing countries to set net-zero goals are also on the increase.

For corporations, as well, responding to climate change is seen as a precondition for doing business. The belief that a company must address this issue squarely to avoid missing out on future growth prospects has gradually become common. Already, leading global corporations are starting to make net-zero of the entire supply chain a new code of practice.

Among consumers, including the young with a sense of crisis about the future, voices are starting to be heard from those who prefer options with a low burden on the global environment. In the United States, for example, aluminum seals on packages are being shunned by young people; while in Japan, consumers are showing a growing preference for soy meat at supermarkets.

In such ways, the recognition is spreading that climate change is an issue needing our immediate attention. In the midst of the onrushing green wave, Japan has declared to achieve net-zero by 2050, and has also set a new target to reduce greenhouse gas emissions by 46 percent in fiscal year 2030 from its fiscal year 2013 levels. Furthermore, Japan expressed its intention to continue strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by 50 percent. Our panel strongly approves the setting of new reduction targets. We further believe society as a whole will need to be involved in achieving these targets.

(3) Making the initiatives for net-zero into opportunities to build a more abundant society

Initiatives have begun in many different fields toward achieving net-zero, as a theme necessary for maintaining a desirable global environment. We cannot agree, however, with limiting discussions solely to the objective of reducing greenhouse gas emissions. Achieving

net-zero need not mean adopting an ascetic approach to avoid imposing an environmental burden or to reduce the risk of natural calamities due to climate change.

If the effort to achieve net-zero is instead seen as an occasion for transforming to a sustainable new economy and society, it will become possible, while living in harmonious coexistence with nature, to greatly change socio-economic systems, from a linear to a circular economy, from a centralized to a decentralized system. Corporations can then realize more flexible management, regions can become more self-reliant, and individuals can enjoy richer lives. Our future is created by considering the effort to achieve net-zero as an opportunity for reform toward a new economy and society.

In Europe, the United States and elsewhere, from a national strategy standpoint such as the need for economic growth, economic and geographic diversity, and energy policy in each country, initiatives for achieving net-zero are taken and tied in with growth of domestic industry, jobs creation, and infrastructure provision.

As for corporations, carrying on activities geared to the notion that addressing climate change is an opportunity has given birth to products and services that provide the value of “initiatives for climate change plus alpha.” For example, Introducing high-efficiency home electronics is economical in that it saves electricity, and makes the living environment more comfortable, while car sharing provides convenience to those without a car.

Local areas, meanwhile, are starting to take up the challenge of regional revitalization through introduction of microgrids and distributed power sources, enabling local production of energy for local consumption while at the same time enhancing disaster resilience.

In such ways, if initiatives for achieving net-zero are redefined as an occasion to rebuild a more sustainable economy and society, large growth markets will emerge for restructuring the economy and society. This will in turn encourage new investment and innovation through challenges by corporations seeking to carve out a new future, strengthening the competitiveness of industry and growth dynamism of Japan’s economy, while at the same time a rich sustainable society will be achieved that preserves a desirable global environment.

To achieve this virtuous cycle, initiatives for realization of net-zero must be seen not as having the purpose only of solving climate change, which is a global-scale problem in the history of humankind. Rather, they need to be carried out in the spirit of being “good in every way,” aiming for the growth of our economy and society and for realizing a comfortable and enriching life for people at the same time.

2. What Approach Should Be Taken to Achieve Net-Zero?

(1) Approach from both demand and supply sides

Japan's approach to climate change issues up to now has been centered on initiatives from the product and service supply side. While corporations have continued making efforts for energy conservation and low carbon, there were limits to the amount of emission reduction that corporations could achieve on their own. Moreover, due to the persistence of the deflation economy, even as corporations have accumulated internal funds, investment levels have remained low.

The new targets set by Japan of achieving net-zero by 2050 and reducing greenhouse gas emissions by 46 percent in fiscal year 2030, while continuing strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by 50 percent, are highly ambitious goals; these cannot be achieved simply as an extension of the initiatives taken up to now. Further strengthening the supply-side approach is of course important; but an approach from the demand side must also be carried out actively, involving all of society in a united effort. In addition, while achieving the 2050 target will require innovation and implementation in society, there is less than a decade left for achieving the fiscal year 2030 target. To reach that goal, it will be necessary to proceed with both a planned approach and a sense of urgency, fully mobilizing all the relevant existing technologies.

If individuals see the value in decarbonizing and come to prefer a decarbonized lifestyle, or if investors give priority to net-zero in their investments, corporate activities will change greatly in response. By skillfully combining government regulations and incentives to change society's awareness and structures, the mechanisms by which "initiatives for net-zero are essential to growth" need to be reinforced, and green transformation which brings radical change to the economy and society should be carried out.

One of such instruments is carbon pricing, which is a method of changing the behavior of emitters through economic incentives by placing a price on carbon. This mechanism is being introduced in some other countries. Various types of carbon pricing methods exist, such as carbon tax, emissions trading system, and carbon credit trading; the hope is that by making skillful use of this mechanism, innovation will be spurred by price signals. Also, if carbon pricing results in government revenue such as through taxation, it can be utilized as a source of funding the costs of the transition to a decarbonized society. Japan, while seeking to achieve the reduction targets along with economic growth, should give substance to these

instruments as soon as possible so that they can serve as incentives for spurring business reform and innovation in corporations, toward early decarbonization.

To encourage individual behavioral changes, it would be desirable to establish broad understanding among the public as to why decarbonization is necessary to the extent of changing lifestyles, and why net-zero needs to be achieved in a rapid manner. To this end, along with thoroughgoing scientific, logical, and quantitative explanations, it will be necessary to exercise ingenuity in creating a shared awareness among each individual that these are not issues far in the future in a far-off place, but are issues in which they themselves have a direct stake; and to endeavor to shape out of this awareness a major social trend expanding to the entire public.

Also needed will be initiatives for motivating the public to go from this understanding to behavioral changes. Providing mechanisms to show people how changes in daily life can contribute to net-zero, such as visualizing the CO₂ emissions in everyday activities, and options that will make it easier to change daily life, is key. Use of digital technology, blockchain, AI and the like not only provides a base supporting visualization and consumer behavior changes, but also makes possible large-scale reductions in the demand for energy and materials through transition to a circular economy. It is therefore necessary to accelerate the transition to a digital society.

It is also important to engage regions in a united effort toward realizing a decarbonized society. Initiatives involving local regions in local production of resources for local consumption are now under way, drawing on the characteristics of each region, including introduction of renewable energy, aimed at realizing both decarbonization and regional revitalization. It is hoped that expanding this expertise horizontally will lead to the promoting of decarbonization throughout society as a whole.

A key to achieving net-zero by 2050 is to decarbonize the energy sector, given that more than 80 percent of Japan's greenhouse gas emissions are from energy. A major premise first of all is seeking to introduce renewable energy as a main power source to the extent possible. A further aim is to achieve widespread use at reasonable costs. On this base, innovation will be carried out in such areas as use of hydrogen, ammonia or other new energy sources, or use of carbon capture and storage (CCS) to deal with generated CO₂. Given the height of the hurdles to be overcome, all options should be pursued from a technologically neutral standpoint in light of such factors as the geographic features of Japan and the characteristics of each energy source.

Just as important as innovation is social implementation. Japanese corporations have areas where they boast global technical superiority in decarbonization, such as batteries, hydrogen, and automobiles; but the question is whether these technologies can be sold and obtain worldwide market shares as new products and services. Turning a technology advantage into business and recovering the development investment, bringing new products and services to the market and gaining wide acceptance, will move the country as a whole closer to achieving net-zero. Along with government support in infrastructure provision and other areas, we would like to see active investment by corporations themselves toward giving birth to this virtuous cycle.

In financial markets, there have been onrushing waves of demands that corporations take net-zero initiatives. The voices asking for information disclosure about the risks and opportunities as well as management strategy of climate change, have become increasingly prominent and starting with Europe and the US, discussions have begun internationally, toward enhancing disclosure. There is also growing pressure by investors using their shareholder rights to demand that companies take initiatives towards net-zero. Global moves include central banks monitoring the impact of climate change risks on financial systems, and financial institutions assisting the companies they lend to with their response to climate change.

Climate change actions are massive investment opportunities as the world closely watches, ones that are not to be missed but to be met bold spending. Developing the market environment for promoting green finance or other forms of sustainable finance, such as a framework for identifying eligibility of investments, will bring the Japanese market status to a green international financial center Japan should aim to draw ESG (environmental, social and governance) funds, which is estimated to be US\$ 35.3 trillion and promote funding aimed at realizing carbon neutrality including transition finance, which leads to greater industrial competitiveness and growth of Japan's economy.

(2) Bold policy measures necessary for achieving net-zero

The government will need to demonstrate with bold policy measures its strong resoluteness to meet without fail the goals of net-zero by 2050 and the fiscal year 2030 targets, in this way encouraging behavioral changes from the starting point of shared awareness by individuals of their own stake in the matter, while also enabling corporations to move ahead assuredly with high-risk investments such as innovation. To this end, the government should show the clear direction of medium- and long-term support measures, as well as indicating

specific policies and plans regarding its commitment to multi-year use of budgets, taxation systems, and risk-based funds.

Maximum use should also be made of sustainable finance, so that corporate investment in achieving net-zero, including social implementation of technology, can proceed smoothly. From this standpoint, we welcome the funds supply measures recently announced by the Bank of Japan for assisting with climate change action.

In addition, policy measures will need to be carried out in a comprehensive manner by the central government and local regions, and by public and private sectors, from promoting regulatory reform and standardization to backing regional initiatives and lifestyle changes. This will require uniform efforts coordinated by the Cabinet, doing away with the compartmentalized approach in ministries.

It is difficult to accurately predict the future international affairs or trends in technology and innovation. Deciding directions based on analysis of multiple scenarios, and quickly carrying out policy measures and technology development with the latest trends in view, it will also be necessary to act nimbly, revising the course as necessary. Likewise important is to proceed while checking the status of policy implementation and verifying cost-effectiveness, adopting a scientific standpoint and drawing on the views of outside experts.

(3) Exercising leadership on the way to solving the global issue of climate change

Climate change being a global-scale problem, it cannot be solved by the efforts of any one country alone. Moreover, by adversely affecting food production and water resources, as well as raising the risk of conflict, climate change can become a cause of increased tensions in international society, making it a problem that the entire world must engage with in close cooperation. The share of greenhouse gas emissions to the entire world by Japan and EU countries has been lowered as their climate change measures proceeded, while the share of emissions in newly emerging countries has risen. Japan, as a G7 and G20 member with a responsibility regarding the stability and prosperity of international society, is expected to carry out balanced diplomacy bringing together developed countries and newly emerging countries, so that each of the world's nations will actively engage in reducing their own greenhouse gas emissions.

In so doing, it must act not only from the standpoint of being a member of international society, but also from the standpoint of creating a global environment advantageous to Japan. We would urge the Government, in awareness of the need to boost global competitiveness of Japanese corporations and to flow back national wealth inside the nation, to play a leading

role in COP discussions and in rule making such as international standardization, ensuring that rules disadvantageous to Japan are not made, and that each country, including those with large-scale emissions, engages in the same manner in realizing net-zero.

Japan should also make use of its own technology in contributing to the efforts of each nation to deal with the problem of climate change. Transitions to net-zero in Asian countries in particular is important, not only for their contribution to the world's climate policy measures, but also from the standpoint of reducing greenhouse gas emissions in the production sites and supply chains of Japanese corporations. In the field of adaptation to climate change, as well, Japan can conduct assistance by drawing on the country's strength developed over many years such as weather forecasting technology, experience with disasters, and disaster prevention technologies. From such standpoints, we urge that the actions be taken in such a way as to strengthen international relations while also enhancing Japan's standing in international society. That is, while taking into consideration the situation in each country, public and private sectors should cooperate on the funding and technology fronts to contribute to net-zero and to solving global-scale problems such as disasters and conflicts throughout the world, while also expanding business opportunities for Japan.

(Concluded.)