The Basic Environment Plan

May 21, 2024

Introduction

This plan is based on a strong "sense of urgency."

We have been facing a triple crisis: climate change, biodiversity loss, and pollution. In 2023, the world experienced the highest annual average temperature in recorded history, which was 1.45°C (±0.12) higher than the pre-industrial average and caused extreme temperatures and weather disasters frequently in Japan and other countries. The COVID-19 pandemic occurred in 2020 and made it clear that humans are part of an ecosystem and that disturbances in the environmental and ecosystem balance entail enormous risks. Although this awareness of environmental issues is now widely shared, our predecessors sounded the alarm for more than 50 years, as seen in the "Limit of Growth" issued by the Club of Rome and the "Declaration on the Human Environment" adopted at the United Nations Conference on the Human Environment. The Annual Report on the Environment published in 1995 (Heisei 7) also stated the global limit of modern civilization. Human activities are exceeding the biocapacity of the earth (planetary boundary). At COP28 in 2023, the first global stocktake under the Paris Agreement was concluded to include the transition away from fossil fuels in energy systems for the first time.

In addition, as Japan's population has entered a full-fledged decline, the continued concentration of people in Tokyo has been causing a serious impact on various fields in the regions where the population, in particular, the younger generation, continues to flow out.

Furthermore, the Japanese economy has been stagnant for a long time, since the 1990s, with per capita GDP falling from 2nd in the world (in 2000) to 30th (in 2022) and wages barely growing, although it has been trying to overcome these challenges. The Economic White Paper in 2000 stated that the fundamental problem is that the standardized, mass-production industrial society that Japan has built over the past century is no longer in line with the flow of human civilization, namely a structural and essential problem.

Looking at international relations, the world faces situations that are causing a dramatic shift in geopolitics and other issues, as seen in the division between democracies and non-democracies, Russia's aggression against Ukraine, and the Israeli military operation in Rafah in the Gaza Strip.

Japan may reach its limits in terms of its actions to address the current environmental, economic, and social situation if it merely continues such actions in the same way along with the conventional economic and social system. This Basic Environment Plan (the "Plan") states that modern civilization is not sustainable, that a shift is inevitable, and that social change is necessary. In response to the essential issues raised by the First Basic Environment Plan formulated in 1994,[1] Japan needs a shift from the "linear/standard mass production type of socio-economic system," which over-relies on underground resources, such as fossil fuels, and puts emphasis on material wealth, which has supported modern civilization since the Industrial Revolution, to a "circular/high value-added type of socio-economic system" that is based on renewable resources, such as recycled resources and biomass resources, and also emphasizes intangible values and spiritual happiness/wealth. Nevertheless, we have little time left to achieve this major transformation. We should create a new civilization and achieve a major transformation of the economic and social system within the next 30 years, and, as some point out, the choices we will make and the measures we will take in the next 10 years until around 2030 are likely to have an impact on society for thousands of years from now (the "critical 2030").

The Noto Peninsula Earthquake 2024, which occurred on New Year's Day in 2024, reminded us once again of the threats posed by nature. It is important for us not only to have a sense of awe toward nature and to aim for symbiosis with nature based on our traditional view of nature but also to conceive the idea of "planetary health" in which the health of the earth and that of people are integrally considered. Furthermore, each individual should be aware of the relationships between individuals, communities, companies, nations, and the earth as a "concentric circle" and take action accordingly.

The Plan aims to encourage Japan to realize a "circulation and symbiosis based society" (Environmental and Life Centered Civilized Society) that is a sustainable society in which we can achieve a civilization that allows the economy and society to grow and develop by evolving such concepts as "circulation" and "symbiosis," which the past Basic Environment Plans aimed at, by integrally upgrading the environment, economy, and society to the Integrated Improvements on Environment, Economy and Society (II2ES), placing the environment as the basis and axis, and by protecting biocapacity and

[1] "There is a growing need to reconsider our values placing too much emphasis on the pursuit of material wealth, and the prevailing socioeconomic activities and lifestyles marked by mass-production, mass-consumption, and mass-disposal."

improving the quality of the environment.

We expect that the Plan will bring "hope" to citizens by presenting Japan's goal of the circulation and symbiosis based society.

In order for citizens now and in the future to have hope for tomorrow, the Plan aims to take a stance of a "change 'the way of CHANGE'" for long-standing structural problems, couple these problems with economic and social issues from the viewpoint of environmental policies as a starting point, and thereby simultaneously resolve these issues. To this end, based on the purpose of Article 1 of the Basic Act on the Environment, the Plan puts “the quality of life, level of happiness, well-being and economic welfare of each person present and in the future” as its top objective and upholds "new avenues for growth" as the goal in terms of both market value and non-market value. The key to achieving this is to encourage citizens to "coevolve" this objective with natural capital as a basis and capital and systems that maintain, restore, and enhance natural capital by envisioning their "ideal" or "desired" state, including the correction of market failures. This includes approaches to adding high value to the economy as a whole by utilizing environmental value as an intangible asset.

In order to overcome the current crisis and realize a circulation and symbiosis based society and "new avenues for growth," we should not only ensure the sufficiency of our efforts (in terms of speed and scale) based on the best available scientific knowledge so as to deal with the "critical 2030" as well but also contribute to the "welfare of humankind" as Japan is heavily dependent on overseas natural capital. Also, aiming to tackle complex crises and to solve various problems by coupling them, it is indispensable to integrate and synergize various policies. Based on this problem awareness, the Plan sets specific priority strategies in Chapter 2 of Part 2. Furthermore, the Plan aims to encourage, under a partnership in which everyone can participate, the government (e.g., the national government and local governments), markets (e.g., companies), and citizens (including civil society and local communities) to interact, meaning to coevolve toward realizing a sustainable society.

The Circular and Ecological Economy, which was put forth in the Fifth Basic Environment Plan, is the key to realizing a self-reliant and decentralized society in which regional resources are used. This should be developed as an opportunity to practice and implement the "new avenues for growth" toward the "desired future" that communities

expect.

In addition, we will further advance efforts in areas that can be considered the foundation of Japan's environmental administration, including addressing pollution and the restoration of the environment and communities lost due to issues such as Minamata disease and the Great East Japan Earthquake.

The Plan was formulated in the milestone year of exactly 30 years after the formulation of the First Basic Environment Plan. Following and further developing the basic ideas that have been carried through to the Fifth Basic Environment Plan, this Plan describes the ideas and measures that will help people to build a sustainable society so that Japan can overcome the current crisis and show that the coming "30 years" will be a "hopeful future."

Part 1 Environmental, economic and social conditions and direction of development of environmental policies

Chapter 1 Current state of environment, economy, and society, and recognition of challenges

1. Current crisis and the importance of 2030

(1) Growing environmental crisis

Humanity is facing a serious environmental crisis.

The G7 Hiroshima Leaders' Communiqué (May 20, 2023) clearly states that "our planet is facing unprecedented challenges from the triple global crisis of climate change, biodiversity loss and pollution."

In particular, regarding the issue of climate change, also known as the "climate crisis," global average temperatures are on an upward trend with temperatures rising faster since 1970 than in any 50-year period over the last 2000 years. The World Meteorological Organization (WMO) reports that human activities, including greenhouse gas emissions, already caused a global warming of about 1.20°C (±0.12) between 2014 and 2023 compared to the pre-industrial average between 1850 and 1900. In 2023, in particular, the WMO reported the highest annual average global temperature in recorded history, namely 1.45°C (±0.12) higher than the pre-industrial average. Under these circumstances, in 2020, the House of Representatives and the House of Councillors passed a resolution for the "Climate Emergency Declaration," stating that "we share with the world the recognition that 'the issue of global warming has gone beyond the scope of the climate change and has reached the point of a climate crisis.'" In July 2023, UN Secretary-General Guterres declared that "the era of global warming has ended and the era of global boiling has arrived."

According to the decisions made at the 28th Conference of the Parties (hereinafter referred to as "COP28") to the UN Framework Convention on Climate change (UNFCCC), the increase in the global average temperature is expected to be in the range of 2.1 to 2.8°C if member countries fully carry out their efforts under the Paris Agreement adopted in 2015. Meanwhile, even if the world successfully curbs the increase to the

international target of 1.5°C, it may face a more unusual situation,[2] in a broad sense, on a permanent basis compared to the current situation in 2023.[3] Bearing in that mind, we should have a strong sense of urgency. For example, the global average sea level rose by 0.20m over the period between 1901 and 2018, but the WMO expects that even if the temperature rises from pre-industrial times is curbed to 1.5°C, the sea level will continue to rise over the next 2,000 years with an increase of about 2 to 3m.

The Synthesis Report for the Sixth Assessment Report of the Intergovernmental Panel on Climate change (IPCC AR6 Synthesis Report) states that many changes in the climate system, including extreme heat, marine heatwaves, and the increased frequency and intensity of heavy precipitation, are widespread and directly linked to ongoing global warming, resulting in millions of people being exposed to acute food insecurity and in half of the world's population experiencing severe water scarcity for at least part of the year. It also reports that between 2010 and 2020, human mortality from floods, droughts, and storms was 15 times higher in the regions of high vulnerability to climate change, where about 3.3 to 3.6 billion people live, than in the regions of very low vulnerability.

In Japan as well, the annual average temperature in 2023 was the highest since statistics began in 1898, rising at a rate of 1.35°C per century between 1898 and 2023. The annual average temperature increase in Japan is progressing faster than the world average, and some have pointed that the number of midsummer days, extremely hot days, and tropical nights is increasing. Also, the frequency of heavy rainfall and short duration heavy rainfall in Japan has been increasing, causing damage in many regions. The effects of climate change have already been seen in various regions and fields, such as the damage to

[2] In 2023, extreme high temperatures occurred in many parts of the world, and record-breaking monthly and seasonal mean temperatures were reported in many countries. The average sea level also rose due to the progression of ocean warming and the melting of glaciers and ice sheets, reaching the highest level since 1993. In addition, many weather-related disasters occurred. Heavy rains and cyclones that resulted in many deaths were reported mainly in Africa, and the largest forest fires in history occurred in Canada, Hawaii, and Greece. In Japan, the annual average temperature was high nationwide, with 91,467 people (up by 20,438 from the previous year, or about 1.3 times from the previous year) being transported to hospitals for emergency medical treatment due to heat illness from May to September. In addition, record-breaking heavy rainfall occurred in many areas during the rainy season from June to mid-July. Based on the results of an event attribution conducted for this heavy rainfall, it was estimated that the total number of linear precipitation zones across Japan during this period increased by about 1.5 times due to global warming. Moreover, the rice harvest in 2023 in some areas was affected by unusually-high temperatures, resulting in a lower percentage of first-class rice. In Niigata Prefecture, in particular, the percentage of white immature grains increased, as seen in 5.0% for Koshihikari rice (75.3% for the first-class rice in an average year) and 15.6% for Uruchi rice as a whole (74.7% for the first-class rice in an average year) (*as of December 31 (preliminary figures)).

[3] This does not mean that individual weather cases will be reproduced against the background to this year's unique pressure patterns and other events.

agricultural crops and the decline in quality that are caused by high temperatures. The number of people taken to hospital for heat illness has exceeded 400,000 per year since 2010, and a study estimates that this number will increase by 3.2 to 13.5 times under the most extreme warming scenario (RCP8.5 scenario).[4] The causal relationship between extreme high temperatures, heavy rainfall, and frequent disasters in Japan is also becoming clearer through the event attribution method, which quantitatively evaluates the impact of the probability and intensity of abnormal weather conditions caused by global warming.

Furthermore, there are concerns that these impacts of climate change will not be limited to the affected areas but also cause significant damage to the business activities of private companies around the world due to the disruptions of supply chains and logistics, etc.[5]

No trends in long-term improvement have been confirmed for these phenomena, and some express concern that the phenomena may become increasingly worse. When anthropogenic changes due to climate change exceed a certain level and reach the so-called tipping point, large-scale changes, often irreversible, in the climate system are considered to occur. Under the warmest scenario (RCP8.5 scenario), some west Antarctic ice sheets are feared to collapse suddenly, resulting in an event from which no recovery will be possible for thousands of years.

From the perspective of biodiversity, the current era in which we live is also referred to as "the Sixth Mass Extinction." Since the birth of life on the earth, experts consider that there have been five "mass extinctions" in which a large number of living organisms became extinct. The Sixth Mass Extinction has been accelerating at a faster rate than the previous ones, and its main cause is considered to be the effects of human activities. The Global Assessment Report on Biodiversity and Ecosystem Services released by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) states that 75% of the world's land areas have been significantly modified, 66% of the oceans are under the influence of multiple anthropogenic factors, and more than 85% of wetlands have disappeared since 1700. It is also reported that during the past 50

[4] Ministry of Education, Culture, Sports, Science and Technology, "Social Implementation Program for Climate Change Adaptation Technology" (SI-CAT) (FY2015-2019).

[5] The heavy floods in Thailand in 2011 made a great impact on a wide range of supply chains in the automobile and electronics industries, both in Thailand and abroad, pushing down global industrial production by an estimated 2.5% (Ministry of Economy, Trade and Industry, "White Paper on International Economy and Trade 2012").

years, the entire nature on the earth has been changing at a rate unprecedented in human history, with nearly 25% of almost all animal and plant species subject to the study threatened with extinction. Furthermore, the report points out that the current rate of extinction of species on the earth is at least tens or even hundreds of times faster than the average rate for the past 10 million years and is likely to accelerate further in the future if appropriate measures are not taken.

With respect to the marine environment, the area of living coral reefs has almost halved in the past 150 years, and, in the last 20 to 30 years, the decline has accelerated significantly as rising water temperatures and ocean acidification have interacted with other declining factors to increase the impacts. Coral reef sea areas are estimated to face a massive bleaching with high coral mortality, in which a 1.5°C temperature rise will result in a 70 to 90% decrease in coral reefs from their current levels, and a 2°C rise will result in a 99% decrease.

Wildlife is another cause of serious damage to people. In Japan, the number of cases in which bears have injured people has been on the rise for a long time. The number of such cases in FY2023 is the highest since 2006, when statistics were available, and many cases tend to be seen in the northern part of Japan. As the distribution area of bears is showing a tendency to expand, bears have been invading the sphere of human life, threatening the safety and security of citizens. In addition, the expansion of the habitat range and an increase in the number of sika deer have been causing serious damage to the forest ecosystem, such as the decline of the understory vegetation and the occurrence of bare land, and there are concerns that this may undermine the full working of the multilateral functions of forests, such as disaster prevention and mitigation. In the background to this situation, various factors are considered, including changes in the natural environment and social environment, and in particular, the influence of changes in land use, such as a decrease in people's involvement with nature because of the declining birthrate, aging population, and depopulation in recent years. We urgently need to reconstruct land use and wildlife management in consideration of zoning between the habitat areas of wildlife, human activity areas, and buffer areas between these areas.

In addition, as actions against pollution are "basic efforts to protect human lives and environment," it is essential for Japan to advance these efforts as "the unchanging origin of environmental administration in Japan." Environmental pollution of water, air, and soil by chemicals and microplastics is not only a serious risk to biodiversity and other natural

capital but also a challenge that we must continue to address as a risk to human health and well-being.

For example, looking at issues surrounding the water environment, over 80% of the world's wastewater is reported to be released into the environment untreated, and 300 to 400 million tons of heavy metals, solvents, harmful sludge, and other wastes from industrial facilities are dumped annually into water areas around the world.[6] In Japan, the achievement rate of the environmental quality standards for the conservation of the living environment in public water areas (living environment items) tends to be low in lakes, marshes, and enclosed sea areas.[7] In addition, perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), which were used for a wide range of applications in the past, are persistent, highly accumulative, and have the potential for long-range environmental transport, and, at present, they are widely detected all over the world, including in the Arctic. In Japan, there are some cases found in which these substances exceeded their provisional target values in public waters and groundwater, mainly in urban areas and their suburbs.

With regard to plastic pollution, the amount of plastic waste emitted worldwide is expected to almost triple between 2019 and 2060, with the amount of runoff into the environment doubling to 44 million tons per year by 2060, and the amount of plastic deposited in lakes, rivers, and oceans more than tripling.[8] There is concern about serious impacts on ecosystems, including the marine environment, such as those caused by microplastics (plastics generally considered to be less than 5mm).

With regard to these environmental risks, there are also significant impacts brought about by diplomacy and security crises. In particular, Russia's aggression against Ukraine has caused not only catastrophic effects, including environmental ones, but also an unprecedented global energy crisis, inflation making a real economic impact on people's everyday lives, and a worsening situation surrounding global grain and fertilizer prices, which accelerates food insecurity and malnutrition.

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[6] IPBES "Global Assessment Report on Biodiversity and Ecosystem Services (Summary for Policy Makers)" (2020).

[7] The achievement rate of the environmental quality standard for biochemical oxygen demand (BOD) or chemical oxygen demand (COD), which is a typical water quality indicator for organic pollution, in FY2022 was 87.8% (88.3% in FY2021). Looking at the rate by water category, it was 92.4% for rivers (93.1% in FY2022), 50.3% for lakes and marshes (53.6% in FY2021), and 79.8% for sea areas (78.6% in FY2021). The achievement rate of the environmental quality standard for COD in enclosed sea areas by sea category in FY2022 was 68.4% for Tokyo Bay, 50.0% for Ise Bay, 66.7% for Osaka Bay, and 75.7% for Seto Inland Sea excluding Osaka Bay.

[8] OECD, "Global Plastics Outlook: Policy Scenarios to 2060" (2022).

(2) Global limit of modern civilization and the importance of 2030 for the shift of civilization and social transformation (transformative change)

In light of the environmental crisis above, human activities have been going beyond the biocapacity of the earth and the planetary boundary, and it can be said that this has been threatening the stability of the limited environment or natural capital that is the basis of our survival. For example, in terms of biocapacity, if we assume a 50% probability of limiting global warming to 1.5°C, cumulative carbon emissions in the past have already reached four-fifths of the total carbon budget.[9,10] According to the IPCC AR6 Synthesis Report, the CO_2 emissions from the existing fossil fuel infrastructure without additional abatement are projected to exceed the remaining carbon budget for 1.5°C (50%). In addition, Global Footprint Network reports that the global ecological footprint already reached 1.7 Earths by the late 2010s. In addition, a study titled "Planetary Boundaries" uncovered that, in addition to the rate of species extinctions and the circulation of nitrogen and phosphorus, which were already known in 2015, the latest results in 2023 show that new climate change, changes in land use, novel entities,[11] and freshwater use are beyond the zone of uncertainty and at high risk.

Essentially, humans are just one of the species in the ecosystem consisting of many living organisms and the environment surrounding them. The COVID-19 pandemic, which the world has been facing since 2020, has made it clear again that humans are part of the ecosystem and that any imbalance in the environment and the ecosystem entails enormous risks.[12]

Human beings have dramatically consumed a large amount of underground resources, including fossil fuels, and built civilizations accompanied by great modifications of the environment, with the number of individuals, i.e., populations, increasing exponentially. As a result, humans have become unique in the ecosystem or environment, as symbolized

[9] The idea that there is a certain upper limit to cumulative anthropogenic emissions in light of carbon sinks is called a "carbon budget."
[10] Decisions at COP28.
[11] This is a translation of the original term "novel entities" in "Planetary Boundaries."
[12] IPBES "Pandemics and Biodiversity Workshop Report" published in October 2020 states that deforestation, human occupation of wildlife habitats, increased grain and livestock production, urbanization, and other land use changes are responsible for more than 30% of emerging infectious diseases reported since 1960. It points out that the underlying causes of the pandemic are equal to the changes in the global environment that cause biodiversity loss and the climate crisis.

by the proposal of a new geological age, namely the Anthropocene.[13]

More than 50 years ago, in 1972, a warning was sounded to the fact that human beings have been facing such crisis in a research report titled "The Limit of Growth" released by the Club of Rome[14] and in the "Declaration on the Human Environment" adopted at the UN Conference on the Human Environment (Stockholm Conference).[15] At that time, Japan faced serious harm to the people caused by pollution in various regions. Patients of Fetal Minamata disease participated in the conference and conveyed their harm caused by Minamata disease to the world. Japan was quickly taking actions to combat pollution, including the enforcement of a number of pollution-related acts at the so-called "Pollution Session of the Diet" in 1970 and the establishment of the Environmental Agency in 1971. On the other hand, Japan failed to take appropriate measures for a long time against the companies that caused Minamata disease and to prevent the spread of the disease. This experience even now raises questions, if the temporal and social limitations are taken into account, about the importance of initial response and how to deal with a problem of scientific uncertainty, including measures based on the idea of a precautionary approach to the problem.

The Annual Report on the Environment released in 1995 (Heisei 7) described the global limit of modern civilization and the necessity of a shift to a sustainable society, drawing lessons from past case examples of human civilization that broke the capacity of the environment that had supported the civilization, resulting in changing the environment to the extent that the civilization of the time could not cope and destroyed the civilization. The full-fledged decline of the population in Japan and the slowdown in the growth of the world population are consistent with the historical experience of the convergence of the population toward biocapacity, causing a shift of the civilization.

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[13] The idea of the "Anthropocene" was proposed to separate out the geologic era segment in which human activities have a noticeable impact on the global environment, and to define from a geologic viewpoint an era in which humans have a significant impact on the earth's ecosystem and climate. However, a working group under the International Union of Geological Sciences (IUGS) rejected the proposal at its meeting held in March 2024. It is reported that this rejection was not based on the fact that humans had a significant impact on the earth, but based on the argument that there was a need for a more comprehensive discussion of the human impact on the earth as well as the argument that the proposal did not meet the definition of a geologic time period.

[14] The report estimated that a global economic collapse and rapid population decline could occur by 2030 under a scenario assuming that humans continue to consume the earth's resources at a rate faster than they regenerate, and this shocked countries around the world.

[15] The Declaration states that "a point has been reached in history (omitted). Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well-being depend."

Modern civilization is not sustainable and inevitably needs a shift. Transformative change is urgently needed.

Until the Edo period, Japan's civilization was built on renewable resources, such as recycled resources and biomass resources, including hydropower and forests. However, since the Meiji period, the Industrial Revolution was realized through the massive use of underground resources, including fossil fuels, and this brought about the current prosperity. Meanwhile, Japan has been facing a serious environmental crisis. Using the various innovations that emerged over the past hundred-odd years, such as renewable energy and digital technology, as a basis, Japan should create a new civilization based once again on renewable resources, such as recycled resources and biomass resources, and dramatically change the economic and social system.

However, the time remaining to do so is limited. Concerning climate change, in particular, Japan should create a new civilization and dramatically change its socio-economic system over the next 30 years in order to achieve the international 1.5°C target. It is also pointed out that the choices we make and the measures we implement over the next ten years, up to around 2030, are likely to have an impact for the coming thousands of years ("critical decade"). At COP28 in 2023, the first global stocktake under the Paris Agreement was concluded, and member countries agreed on transitioning away from fossil fuels in energy systems, the acceleration of actions to be conducted during this critical decade, and the achievement of net-zero emissions by 2050 in keeping with science.

In addition, in terms of biodiversity, the Kunming-Montreal Global Biodiversity Framework, adopted in December 2022 as a new global goal to replace the Aichi Biodiversity Targets, sets a 2030 mission of taking urgent actions to halt and recover biodiversity loss, and includes 23 global targets to be achieved by 2030. The year 2030 will be the year when the degree of achievement of the 17 Sustainable Development Goals (SDGs) in the "2030 Agenda for Sustainable Development" (hereinafter referred to as the "2030 Agenda") adopted at the UN General Assembly in September 2015 will be assessed.

As described in Part 4, in light of the mid- to long-term environmental, economic, and social directions to be pursued in 2050 and beyond, the Plan assumes that the period of implementation of measures to achieve these goals will generally last until 2030 (a review process will begin about five years after the formulation of the Plan). In accordance with

the best available scientific knowledge, Japan, as a member of the international community, should make its utmost efforts to achieve the goals, while taking into account that the achievement of the measures based on the Plan by 2030 may have a significant impact on the people and the welfare of humankind at present and for a long time to come in the future.

(3) A critical moment toward an environmentally-advanced country

The Third Basic Environment Plan formulated in 2006 (Heisei 18) (cabinet decision on April 7, 2006) upholds the goal that Japan should aim to become an "environmentally-advanced country."[16] Bearing in mind its experience of overcoming severe pollution, Japan has promoted the transfer of technology and know-how to overseas countries, exported goods and services with high environmental performance/capacity, and accepted many visits and missions to Japan from other countries.

However, for example, Japan's share of production of solar panels, lithium-ion batteries, and other technologies, which boasted the world's top share at the time when the Third Basic Environment Plan was formulated, is now declining significantly. Also, its electric vehicles, which have rapidly been spreading around the world in recent years, have not achieved a high sales share at present.[17] Regarding the development of environment-related industries, it is important to further strengthen international competitiveness and lead the results to added value through the cooperation between the public and private sectors to achieve the shift of civilization and social transformation, rather than merely continuing the conventional actions in the same way along with the conventional economic and social system.

Furthermore, with regard to carbon productivity and resource productivity, Japan has been stagnant while other countries around the world have continued to improve. In developed countries, the correlation between carbon and resource productivity and labor productivity increased compared to that in the 1990s, and in a situation where economic growth is decoupling from energy and resource consumption, Japan, in particular for carbon productivity, is now far from the world top level, although it boasted the global

[16] The Third Basic Environment Plan stated that "HERB, a healthy, rich and beautiful environmentally-advanced country, is what Japan should aspire to be."

[17] As some point out, many Japanese companies heavily rely on overseas suppliers for renewable energy and other environmental equipment, and the recent trend toward a weaker yen has made it difficult for them to procure such equipment.

highest in the field until the mid-1990s.[18]

On the other hand, Japan is still one of the world's top countries in terms of the number of environment-related patent applications, and is seen as possessing a high level of competitiveness in intellectual property.[19] As the world transits to a decarbonized society,[20] the demand for such technologies is expected to increase in the future, and international expectations for Japan's technologies are high.

Being the first Asian country to achieve modernization and become a developed country in terms of solving challenges in the process of its development, Japan has a unique position in the international community, such as being the only G7 member country in Asia, and has a role to play in resolving global issues. In particular, in the Asian region, where demand for energy and mobility is expected to significantly grow in the future, Japan is expected to contribute to the sustainable development of not only the Asian region but also the entire globe by promoting cooperation and collaboration, bearing in mind its geographical and historical ties and by utilizing its knowledge and technologies.

In order to meet the above-mentioned expectations toward the goal of becoming an "environmentally-advanced country" set forth in the Third Basic Environment Plan, Japan now stands at a critical juncture in which all stakeholders are required to step up their efforts.

2. Complex crises and challenges related to the environment, economy, and society

The Fifth Basic Environment Plan (cabinet decision on April 17, 2008) states that "Japan is now faced with complex crises and challenges related to all three areas of environment, economy, and society," and Japan still faces these crises and challenges.

(1) Declining population and emerging regional challenges

[18] The share of coal-fired power generation in Japan's electricity supply has increased significantly since the Great East Japan Earthquake, but it had been increasing even before the earthquake (from about 24% in 2002 to about 27% in 2010) after the acceptance of the Kyoto Protocol in 2002.
[19] See Item 2(2) of this chapter.
[20] Article 2-2 of the Act on Promotion of Global Warming Countermeasures (Act No. 117 of 1998) defines a decarbonized society as "a society in which a balance is maintained between the amount of greenhouse gas emitted as a result of human activities and the amount of greenhouse gas absorbed through conservation and enhancement of absorption." The G7 Hiroshima Leaders' Communiqué uses the phrase "achieve net-zero greenhouse gas emissions" in the same sense.

The population of Japan peaked in 2008 and began to decline, entering a society with a full-fledged population decline. The total population has decreased by approximately 2 million people over the past five years,[21] and the number of births in 2022 fell below 800,000 for the first time since statistics began, reaching approximately 759,000 in 2023.[22] Since the Meiji period, changes in the industrial structure led to the concentration of the population in the so-called Pacific Belt region, especially in the Tokyo metropolitan area (Tokyo, Saitama, Chiba, and Kanagawa Prefectures). Even in the last 30 years, the ratio of the population of the Tokyo metropolitan area to Japan's total population increased from 25.7% in 1990[23] to 29.3% in 2023,[24] and it almost tripled from the middle of the Meiji period.[25] Although the share of GDP in the Tokyo metropolitan area is about 34% and the share of loans from financial institutions is about 53%,[26] the growth rate of gross regional product per capita in the 23 special wards of Tokyo between 2010 and 2018 is 0.6%, much lower than the national average of 11.6%.[27]

The continued outflow of population, especially among young people, in regional areas weakened local communities and hindered local governments from fulfilling their administrative functions, which have seriously been affecting various fields in such regions, such as sustainable land management. In addition, compared to those in metropolitan areas, residents in regional areas, particular those in regional municipalities with small populations, tend to be less satisfied.[28]

Moreover, in cities with diffused urban areas (cities with less urbanized areas and low population density in DID[29]), people tend to have longer vehicle mileage per resident and emit more CO_2 than those in cities with intensive urban areas. The development of urban structural sprawl, etc., especially in regional areas, will lead not only to a problem of the

[21] Ministry of Internal Affairs and Communications, "Population Census" (as of October 1, 2022).
[22] Ministry of Health, Labour and Welfare, "Vital Statistics of Japan (Preliminary Report)" (December 2023).
[23] Ministry of Internal Affairs and Communications, "1990 Population Census."
[24] Ministry of Internal Affairs and Communications, "Population, Demographics and Number of Households Based on Basic Register of Residents (as of January 1, 2023)".
[25] According to the "Long-Term Statistical Compendium of Japan" (2020) released by Japan Statistical Association, the population of Tokyo and three prefectures in 1888 accounted for only 11.3% of the total population of Japan.
[26] As for the main offices of listed companies, relocation from the Kinki region to the Tokyo metropolitan area in particular progressed.
[27] The data was calculated using the "Analysis of Circular Regional Economies" tool developed by the Ministry of the Environment, which was commissioned to the Value Management Institute, Inc.
[28] Ministry of the Environment, "Commissioned Project for Study Comprehensive Evaluation Indicators for the Promotion of the Creation of Circular and Ecological Economy" (2022).
[29] The term "DID" or "densely inhabited districts" refers to urban areas defined by certain criteria based on statistical data. DID is set based on the Population Census of Japan.

decline of city centers but also to an increase in CO_2 emissions. However, not a few municipalities are still expanding their urbanization zones despite the fact that the population in the urbanization zones continues to decrease.[30] In addition, the average temperature in Tokyo increased by about 0.9°C based on a comparison of the period between 1961 and 1990 and the period between 1991 and 2020, because of the artificialization of the ground surface cover,[31] the densification of city forms, and an increase in anthropogenic heat, together with climate change and the heat island effect.[32]

On the other hand, due to the COVID-19 pandemic, the aforementioned urban and regional challenges have been changing, as seen in the tendency that a large number of people have been moving out from central Tokyo, as more and more people make use of ICT that enables a non-contact, non-face-to-face lifestyle, such as teleworking and online learning. According to a questionnaire survey targeting Tokyo residents, the most common reason for their interest in moving to regional areas was "Having been attracted to low population density and rich natural environment," which indicates that regional areas have the potential to be an independent and decentralized society that takes advantage of the favorable regional environment.

(2) Prolonged economic stagnation

Some experts consider that Japan has been in a state of prolonged stagnation since the 1990s.[33] For the last 30 years, Japan's nominal GDP increased only slightly, and in 2023, due in part to a significant depreciation of the yen against the dollar in the exchange rate, Japan was overtaken by Germany for the first time in 55 years and ranked fourth in the world. Although Japan is said to be a "*Monozukuri* or manufacturing country," the GDP[34]

[30] In the regional areas, between 2015 and 2020, 114 cities expanded their urbanization zones, 20 reduced their zones, and 70 maintained the current status, but 49 out of the cities that expanded their urbanization zones have experienced a decrease in the population in the zones (Ministry of Land, Infrastructure, Transport and Tourism, "2020 Urban Planning Status Survey" (as of March 31, 2020) and "2015 Urban Planning Status Survey" (as of March 31, 2015)).

[31] In the 23 special wards of Tokyo, the land areas for buildings, roads, and railroads increased while the areas of water bodies, etc. decreased from the 1990s (National Land Information: "Urban Area Data" and "Land Use Subdivision Mesh Data").

[32] The data was calculated by the Ministry of the Environment using the Historical Weather Data Search tool on the Japan Meteorological Agency website.

[33] For example, the expression "the lost 30 years" is sometimes used, as seen in the "Interim Report of the Committee on New Direction of Economic and Industrial Policies of the Industrial Structure Council under the Ministry of Economy, Trade and Industry" (June 2022).

[34] This data is based on the nominal home currency. Japan's GDP per capita in 2022 halted at about a quarter of that of Luxembourg, the highest country, and less than half that of the U.S.

of the manufacturing sector has remained flat in Japan,[35] while the GDP of the U.S. and Germany has doubled since the late 1990s. GDP per capita fell from the 2nd place (2000) to the 30th (2022) in the world[36] and both real and nominal wages have barely grown, unlike other developed countries. In addition, the Gini coefficient for initial income has been expanding from 0.5263 in 2005 to 0.5700 in 2021 (it has remained almost flat for redistributed income, mainly social security).[37]

During this period, however, Japanese companies succeeded in raising ordinary profits despite sluggish sales growth, while they did not actively spend on domestic capital investment and labor costs.[38] (Some point out that although overseas investment became active, the fruits of the investment have not been fully returned to the domestic market.) The excess savings in the corporate sector in Japan have remained at a higher level than those in other major countries since the 2000s, and the cash and deposits of private nonfinancial corporations exceeded 330 trillion yen as of December 31, 2023.[39] These fixed cost reductions, which were promoted in the course of streamlining corporate management, played a major role in improving corporate profits. However, as some point out, they may not yet contribute to improving people's lives as companies have faced new challenges, such as stagnant innovation, an increase in unstable part-time employment, concerns about fixed inequality,[40] and a shrinking middle class, which has weakened the virtuous circulation of the economy. (Experts say that the so-called "fallacy of composition" may have occurred, in which a macroeconomic problem occurs despite the

[35] OECD Statistics.
[36] IMF-World Economic Outlook Databases. Looking at the real GDP per hour worked (labor productivity per hour), calculated by dividing the real GDP by the total macro -level hours worked (man-hour-based labor input), which can be expressed as the number of workers multiplied by the number of hours worked per worker, Japan exceeds that of Germany and France and is on par with other major developed countries, while it is inferior to that of the U.S. (Cabinet Office, "Annual Report on the Japanese Economy and Public Finance 2022").
[37] Ministry of Health, Labour and Welfare, "2021 Income Redistribution Survey Report" (2023).
[38] Cabinet Office, "Japan Economy 2021-2022 - Toward the realization of a virtuous circulation of growth and distribution" (2022).
[39] Bank of Japan, "Japan's Flow of Funds Accounts (Preliminary Report) (Q4 2023)" (March 21, 2024)
[40] In terms of employment, Japan's unemployment rate tends to be low among developed countries, but job mobility is low and the wage gap between men and women and between regular and irregular workers is large. In recent years, the income gap as seen by the Gini coefficient (before income redistribution) and relative poverty rate has been relatively large among developed countries, and this income gap affects various aspects of people's lives. For example, lower income people consume more cereals, but less vegetables and meat, and have a higher rate of obesity. In addition, for such people, the electricity bill accounts for a large proportion of consumption expenditure, and they are easily affected by international fluctuations in energy prices. In addition, Internet use is substantially lower (IT disparity). In comparison, households with higher annual incomes are more likely to send their children to 4-year universities after graduating from high school.

fact that individual corporate activities are in a sense acting rationally.)[41]

Looking at the breakdown of intangible assets investment, which is considered to be significantly related to economic growth in developed countries in recent years, Japan has a large share of "innovative property," such as R&D investment, and the ratio of the property to GDP is one of the highest among developed countries. Meanwhile, the share of "economic competitiveness" consisting of brand assets (marketing-related assets, e.g., advertising expenses), human capital, and organizational structure is small and its ratio to GDP is one of the lowest among developed countries.[42] As a result, the level of the ratio of product innovation realization, which is highly correlated with the GDP ratio in "economic competitiveness," is also lower in Japan than other developed countries.[43] In addition, Japan is characterized by the fact that it has a high number of patent applications per population, but a low number of trademark applications. This uncovers that although it has strengths in indigenous technologies, Japan faces challenges in earning profits by the introduction of new products and services.[44] The sum of the ratios for the opening and closing of businesses is also smaller than that in major developed countries, showing that the metabolism of companies in Japan is very low.[45]

The growth of investment in digital-related fields is also low compared to other developed countries, and it has remained almost flat since the 1990s. In particular, Japan's lagging digitalization was pointed out during the COVID-19 pandemic and this situation is sometimes described as "digital defeat."[46]

Terms and conditions of trade that Japan has concluded[47] have deteriorated significantly since the 2000s because companies have not been able to pass on an increase in import prices to export prices. In FY2022, the import value of fossil fuels reached a record high of 35.2 trillion yen, a major factor causing a deterioration of the trade balance. In addition,

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[41] Reference: "Basic Policy for Economic and Fiscal Management and Reform 2023" (cabinet decision on June 16, 2023), etc.
[42] Document distributed at the 108th meeting of the Comprehensive Policy Subcommittee of the Central Environment Council held in June 2023.
[43] Same as above.
[44] Cabinet Office, "Annual Report on the Japanese Economy and Public Finance 2022" (July 2022).
[45] From the perspective of promoting innovation across Japan, it is also important to improve existing companies' ability to create innovation.
[46] Prime Minister Kishida's press conference in August 2023.
[47] The "World Economic Trends" (2011) report released by the Cabinet Office states that "Terms and conditions of trade mean the ratio gained by dividing the export price index by the import price index. The terms and conditions of trade will improve (worsen) if export prices rise (fall) relative to import prices, making it favorable (unfavorable) for a country to trade."

the real effective exchange rate fell by about 60% in 2023 compared to the 1990s, the lowest level since 1970, when the exchange rate was statistically retroactive, and the yen became weaker against the dollar than in the period in which Japan had adopted the fixed exchange rate system as 360 yen per dollar.

(3) Increasing the importance of international cooperation centered on the environment

In recent years, there has been a significant change in the international balance of power, with the rise of emerging and developing countries and the relative decline in the status of the G7 member countries (so-called "G Zero world"). The global world has been becoming more and more diverse than ever amid such change, which can be described as a period of historical shift, as seen in the division between democracies and non-democracies, the COVID-19 pandemic worldwide, and Russia's aggression against Ukraine. In particular, such change has had the most serious impact on the poorest and other vulnerable countries.

In particular, Russia's aggression against Ukraine drove the rest of the world to reaffirm the importance of energy security, food security, and economic security, and it has also increased concerns about rising international energy, resource, and food prices, supply disruptions, and risks affecting global and regional stability. Many European countries, including Germany, have responded to this situation by significantly raising their targets for renewable energy after Russia's aggression against Ukraine.

Under these circumstances, Japan remains dependent on imports from abroad. Japan's energy self-sufficiency rate is about 13%, and its food self-sufficiency rate on a calorie basis is about 38%. In addition, Japan is almost entirely dependent on imports of raw materials for fertilizers, which are necessary for food production, and rare metals, which are indispensable for semiconductors and advanced technologies, in a situation where these materials are unevenly distributed among certain countries. Accordingly, the amount of virtual water imported into Japan (the amount of water required if an importing country is to produce food, livestock products, etc. in its own country) was approximately 80 billion m^3 in 2005, making Japan's dependence on water consumed outside the country more than 1000%, the highest in the world. In addition, despite the fact that the forest stock in Japan, mainly planted forests, is increasing year by year,[48] Japan has been

[48] In 2022, planted forests accounted for 64% (3,545 million m^3) of the total forest stock (Forestry Agency,

importing about 60% of its lumber. This shows that Japan is heavily dependent on overseas natural capital and is also making a serious impact on the increasing environmental loads in overseas countries.

Conventionally, the procurement of resources, such as food, water, energy, and metal resources, has been deeply related to environmental issues and has also been an important issue in terms of environmental diplomacy and security. However, with the rise of emerging countries, competition for international procurement of natural resources has intensified, and the risk of conflict, increased refugees, and regional instability caused by environmental destruction has also increased, leading to the "environment" being positioned as one of the most important security issues even more than before.

In particular, since the 2000s, there has been a growing recognition that climate change is a security issue that concerns the very existence of humankind, namely so-called "climate security." The IPCC AR6 Synthesis Report states that "climate change will reduce food security, affect water security, and hinder efforts to achieve the Sustainable Development Goals." In addition, extreme weather events and rising sea levels brought about by climate change may have a significant impact on Japan's security in various forms, such as more frequent and severe natural disasters, an increase in disaster responses, more serious energy and food problems, reduction of land areas and exclusive economic zones, more frequent use of the Arctic sea routes, and geopolitical changes associated with these events.

The IPBES Global Assessment Report on Biodiversity and Ecosystem Services points out that the loss of diversity, including genetic diversity, undermines the resilience of many agricultural systems to pests, pathogens, climate change, and other threats and poses a serious threat to global food security, and the report also states that from the perspective of stable food production, it is inevitable to maintain and restore biodiversity.

Japan's share of GDP in the world peaked at 17.9% in 1994, when the First Basic Environment Plan (cabinet decision on December 16, 1994) was formulated, and has declined in recent years to below 5%, the same level as in the 1960s. Similarly, the share of Japan's population in the world has declined from about 2.2% in 1994 to about 1.6% today. Under such circumstances, world peace and stability are more important to Japan than ever before. Contributing to the welfare of humankind, including the overcoming of

"Current Status of Forest Resources" (as of March 31, 2022)).

the environmental crisis, through international cooperation will lead to the enhancement of Japan's presence in the world and directly contribute to the national interest.

3. Toward the next step beyond and sophistication of II2ES, placing the environment in which citizens now and in the future can have hope for tomorrow at the core

(1) "Mainstreaming" the environment in the fields of economy, diplomacy, security, and regional policies as well as in a wide range of other fields – disseminating the recognition that natural capital (the environment) is the foundation of economic and social activities

The recent emergence of the environmental crisis, as is symbolized by the wedding cake diagram showing the so-called SDGs, is establishing a global recognition that economic and social activities are established on the basis of natural capital (the environment) and that damage to natural capital will have a negative impact on economic and social activities. For example, in the Global Risks Report released by the "World Economic Forum," environment-related risks, such as a failure of climate change mitigation measures and biodiversity loss, ranked highest in the ranking of long-term risk severity, even during the period of the COVID-19 pandemic.[49] Moreover, the report also helped to raise awareness of the need to address the structural problems in the economic and social systems behind the environmental crisis, i.e., the need to realize a sustainable society, seeing the climate change issue as a typical example of "market failures" in current capitalism.

Both the COVID-19 pandemic occurred in early 2020 worldwide and Russia's aggression against Ukraine began in February 2022 triggered discussions again on the need for a sustainable society. For example, as the risk of infectious diseases and other health threats are increasing with climate change and the destruction of ecosystems, experts have been holding proactive discussions on "planetary health," a paradigm meaning that the health of the earth (the health of the global environment) and human health are inseparable. Against the backdrop that the vulnerability of global supply chains has become apparent, global society, as discussed in Section 2(3) of this chapter, has been focusing on the growing importance of not only the movement to diversify supply chains but also the

[49] The 2024 report ranks "critical change to Earth systems (climate tipping points)" as the second most serious risk for the next 10 years.

sustainable procurement and use of food, energy, critical commodities, etc.[50]

Combined with these movements, it can be said that the realization of a sustainable society has been firmly positioned as a common goal of humanity over the decades from the 1987 proposal made by the UN World Commission on Environment and Development (Brundtland Commission), a body that Japan proposed to launch.

In light of the emerging environmental crisis, countries have been accelerating the introduction of policies based on an idea of maintaining, restoring, and enhancing natural capital as a basis, i.e., an idea that environmental conservation is the source of economic growth. Europe and the U.S. introduced a mechanism to stimulate a large scale of investment in decarbonization sectors, as seen in the Inflation Reduction Act of the U.S. Japan as well has been accelerating the introduction and implementation of measures related to green transformation (GX)[51] since it declared net-zero greenhouse gas (GHG) emissions by 2050[52] in 2020. The "Strategy for Promoting Transition to a Decarbonized, Growth-Oriented Economic Structure" (cabinet decision on July 28, 2023; hereinafter referred to as the "GX Promotion Strategy") states Japan's investment at the level of over 150 trillion yen for the next 10 years as a rough estimate. In light of the fact that investment in pollution prevention accounted for 17% of total capital investment in the past (in 1975), investment in the field of decarbonization is certain to be huge. In addition, this is a situation in which national policies around the world aimed at environmental conservation can make a significant impact on global industrial and corporate activities.

The emergence of the environmental crisis has decisively changed people's perception of the relationship between the environment and the economy. Conventionally, the perception that "environmental measures are a cost"[53] remained deep-rooted among

[50] In relation, French economist Jacques Attali proposed an "economy of life" (Jacques Attali, "L'Economie de La Vie" (2020)).

[51] The "Strategy for Promoting Transition to a Decarbonized, Growth-Oriented Economic Structure (GX Promotion Strategy)" (cabinet decision on July 28, 2023) states that "the industrial and social structures that have been centered on fossil energy since the Industrial Revolution should be shifted to those placing clean energy at the core."

[52] Since this declaration in 2020, Japan has been using the terms "carbon neutrality" and "decarbonization." On the other hand, in the international context, the term "net-zero" is commonly used, as seen in the outcome documents of the G7 Hiroshima Summit. However, the basic meaning of these terms is recognized as the same.

[53] "During the period of rapid economic growth, both internationally and domestically, economic growth and environmental conservation were generally considered to be separate and mutually traded off, as exemplified by the so-called 'economic harmonization clause' (deleted in the 1970 amendment) of the Basic Law for Environmental Pollution Control (Act No. 132 of 1967), which required the conservation of the living environment to be in line with sound economic development." (Ministry of the Environment,

people.[54] However, there is a growing belief that addressing environmental issues is seen as a given requirement that defines a new socio-economic system as digitalization advances and that an ideal approach to addressing such environmental issues will affect competitiveness and other aspects. Particularly, since the declaration of net-zero greenhouse gas (GHG) emissions by 2050, Japanese companies have been increasingly aware that climate change and biodiversity loss are not only risks but also opportunities, against the backdrop of the expansion of investments in the environment, social and governance (ESG) fields and the spread of initiatives, such as the Task Force on Climate-related Financial Disclosures (TCFD) and the Taskforce on Nature-related Financial Disclosures (TNFD). Also, a movement to link the solutions of environmental issues and other social issues to the creation of corporate value is gaining momentum. With regard to digitalization, the COVID-19 pandemic has also been becoming a trigger of rapid economic and social changes, as seen in the rise of businesses utilizing big data and the spread of e-commerce and remote work. Although digitization is expected to increase electricity consumption, it may contribute to the reduction of environmental loads, such as increased efficiency in the management of energy and manufacturing processes, and an improved operating rate of goods backed by the spread of the sharing economy. Furthermore, in the future, digitalization is expected to significantly transform economic and social systems, such as the spread of generative AI.

In addition, against the backdrop that companies have been advancing the horizontal division of labor across borders and that this has expanded value chains worldwide, there is a growing need to reduce the environmental loads of the entire value chain. Companies' approaches to environmental conservation, including efforts to utilize renewable energy in business activities[55] and adaptation efforts, are becoming a requirement for their participation in the global value chain and its sustainability, differentiation of goods and services, and international competition. Moreover, ease of access to natural capital, e.g., renewable energy and water resources, has been influencing companies' decisions on the locations of business establishments. In this regard, the current share of renewable energy in Japan's power supply mix is about 20%, which is the lowest level in the G7 countries and on par with the U.S., and this can be said to be one of the challenges for companies in conducting business activities in Japan.[56]

"Quality of the Environment in Japan" (1994)).

[54] For example, with regard to renewable energy, the cost of generating electricity was high, but the cost of generating electricity has been decreasing year by year, and the supply capacity has been improving.

[55] For example, RE100 is an international initiative to encourage companies to obtain 100% of the electricity used by their own operations from renewable energy sources.

[56] It should be noted that Japan ranks 6th in the world in terms of the amount of renewable energy that was

Moreover, the realization of a sustainable society, including a decarbonized society, requires solutions to structural problems in the economic and social systems, which may involve so-called disruptive innovations. We are now also in a phase of international competition for the supremacy of these innovations.[57]

In international relations, in the wake of Russia's aggression against Ukraine and the situation in the Middle East, it has become more important than ever to lead the international community toward cooperation rather than division and confrontation. In this regard, global environmental issues are common challenges for the international community, and the development of international cooperation centered on the environment will not only accelerate efforts to achieve international commitments on the environment and climate change but also contribute to global stability and the welfare of humankind, leading to the enhancement of Japan's position in the international community.

At the regional level, since around the 1990s, Minamata City, which experienced the devastating impacts of Minamata disease, declared itself an "Environmental Model City" and worked on the city development centered on the environment. Since the formulation of the Fifth Basic Environment Plan, nearly 200 municipalities and associations have been explicitly working to create a Circular and Ecological Economy. In addition, as of March 31, 2024, more than 1,000 municipalities have declared themselves a so-called "Zero Carbon City," a city aiming to achieve net-zero greenhouse gas emissions or CO_2 emissions by 2050, and 73 (as of March 2024) Decarbonization Leading Areas and other regions have been accelerating actions to link decarbonization and environmental conservation efforts to the economic regeneration of the communities.

In addition, a shift is seen in lifestyles and culture toward more environmentally-conscious ones. For example, the UNFCCC 24th Conference of the Parties (hereinafter referred to as "COP24") held in 2018 adopted the Fashion Industry Charter for Climate Action.

Furthermore, an idea that regards environmental issues as human rights issues has become

introduced (based on the results in 2022), of which solar power generation ranks 3rd in the world (based on the results in 2022), which is not a low rank by any means.

[57] The growth of Japan's automobile industry is said to be mainly based on Japan's proactive response to pollution control and the Kyoto Protocol.

more prevalent. The UN General Assembly in July 2022 adopted a resolution[58] on the "human right to a clean, healthy and sustainable environment" with the support of 161 countries.[59] In addition, the importance of so-called "human rights and environmental due diligence"[60] is increasing internationally, and "Environmental Justice" and "Climate Justice," which emphasize environmental considerations for vulnerable people, intergenerational equity, etc., have increasingly been becoming important. Also, the number of climate change-related lawsuits around the world began to increase in the mid-2000s, and has been increasing further, and lawsuits have been filed even in Japan after the adoption of the Paris Agreement.[61] Currently, nearly 200 new cases are filed annually.[62]

As noted above, with the emergence of the environmental crisis in recent years, environment issues have steadily become "mainstream" in a wide range of fields, including the economy, environmental diplomacy, security, and regional policies.

(2) Next step beyond and sophistication of II2ES, placing the environment in which citizens now and in the future can have hope for tomorrow at the core - shifting from the "Limit of Growth" to "socioeconomic growth and development by protecting biocapacity and improving the quality of the environment"

As we have seen, the environmental, economic, and social situations in Japan during the approximately 30 years since the formulation of the First Basic Environment Plan were not necessarily situations in which the majority of the people could maintain their hope. In recent years, the concept of well-being has been attracting attention, but when comparing the level of happiness, Japan continues to have the lowest level among developed countries.[63] In addition, about half of all households are aware that their lives

[58] This contains details pertaining to both substantive and procedural rights.
[59] Japan voted in favor of this resolution in light of the need to create a sustainable environment, which is the goal of this resolution, amid the worsening of the effects of climate change, but, in the adoption of the resolution, Japan stated on the floor that the concept of the "right to a clean, healthy and sustainable environment" has an unclear meaning.
[60] This means a series of actions taken by a company to identify, prevent and mitigate negative impacts to human rights and the environment of its group companies and suppliers, to assess the effectiveness of its efforts, and to explain and disclose information on how it addresses them.
[61] In some overseas countries, courts have shown a precedent that recognizes the threat of climate change as a "real and imminent" danger to human rights and considers the government's failure to set adequate reduction targets as a violation of the government's obligation to protect the residents of the country.
[62] UNEP and the Sabin Center for Climate Change Law at Columbia University, "Global Climate Litigation Report: 2023 Status Review."
[63] Sustainable Development Solutions Network (SDSN), "World Happiness Report 2022."

are difficult.[64] In addition, a survey shows that many young people do not have bright hopes for their future compared to other countries.[65]

Moreover, as our predecessors feared, the environmental crisis, which is the foundation of human existence, is becoming reality as a matter involving hope for the future. Globally, including in Japan, some experts point out "eco-anxiety," a chronic fear and anxiety about the environmental crisis.[66]

The Second Basic Environment Plan (cabinet decision on December 22, 2000) and the following editions clearly state that the II2ES approach should be pursued. This concept will become even more important as we aim to realize a sustainable society by addressing the complex environmental crisis and the issues related to the environment, economy, and society, while responding to the various changes that may occur in the future. Furthermore, given the current environmental crisis, which may undermine the foundation of human existence, we should advance II2ES, which is the foundation of the economy and society, to the next step to free the people from anxiety and give them hopes for the future. In other words, we need to sophisticate II2ES toward the integrated improvements placing the environment, which is the foundation of human existence, at the core so as to seek simultaneous solutions to economic and social issues by leveraging and driving actions for avoiding and addressing an environmental crisis.

In this regard, the First Basic Environment Plan, formulated 30 years ago, states in the beginning that "There is a growing need to reconsider our values placing too much emphasis on the pursuit of material wealth, and the prevailing socioeconomic activities and lifestyles marked by mass-production, mass-consumption, and mass-disposal." This issue points out the nature of efforts for the sophistication of II2ES.[67]

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[64] Ministry of Health, Labour and Welfare, "Annual Health, Labour and Welfare Report 2020" and "Summary of the Comprehensive Survey of Living Conditions 2022." Related situations have been improving in recent years.

[65] Cabinet Office, "International Survey of Youth Attitude (FY2018)" (June 2019).

[66] A survey shows that in Japan, the negative impact of climate anxiety is stronger in such attributes as young people (16-25 years old) and women (Dentsu Macromill Insight, Inc. "Dentsu Sustainable Lifestyle Report," the 9th Survey (Survey on the Awareness of Climate Anxiety) (2022)).

[67] The Economic Planning Agency's "FY2000 Annual Economic Report" (July 2000) states that "the more fundamental problem is a structural and essential problem that the industrial society focusing on the standard mass production, which Japan has built up over the past century or so, is no longer in line with the flow of human civilization." The report points out that it is urgently necessary for Japan to change its systems and practices in the industrial society focusing on standard mass production, which countries worldwide adopted most in the 1980s, in order to revitalize the Japanese economy and prepare for the trends of diversification, shifting to a service-based economy, and informatization, which were about to progress around the world.

Since around the 2000s, the number of people in Japan who put weight on spiritual happiness/wealth rather than material wealth has nearly become double. In addition, concerning "wealth" in the first place, more and more people have been raising awareness that merely some of the wealth can be measured by GDP, which used to be a symbol of material wealth.[68] Furthermore, concerning GDP, some point out that a "qualitative" improvement, rather than "quantitative" expansion, has been playing a main role in growth in the current advanced economies in particular, in which "high quality, high added value" goods and services are increasingly produced by utilizing intangible assets, such as human capital, R&D, data, and brand value, in both manufacturing and non-manufacturing industries. Decarbonization and other environmental measures are beginning to drive investment activities. As a result of these trends, an "absolute decoupling" has been observed in many advanced countries, i.e., a situation in which the economy grows with lower environmental loads.

A shift from a "linear/standard mass production type socio-economic system" that emphasizes material wealth and over-reliance on underground resources, such as fossil fuels, which has supported modern civilization since the Industrial Revolution, to a "circular/high value-added type socio-economic system"[69] that emphasizes intangible value and spiritual happiness/wealth based on renewable resources, such as recycled resources and biomass resources (including the process of investment activities to realize this shift) can be said to become a common foundation for realizing true "affluence" in the modern era, i.e., improving people's quality of life, happiness, well-being, and economic welfare, including not only elements captured by GDP, e.g., recovery from long-term economic stagnation, but also those not captured by GDP.

In light of this perspective, "environmental mainstreaming" is an inevitable trend. This is a shift from the "Limit of Growth"[70] to "economic and social growth and development

[68] For example, the G7 Finance Ministers and Central Bank Governors Meeting Communiqué (2023) states that "Our economic and social structures have undergone dynamic and fundamental transformation. Digitalization, sustainability in particular climate change, inequality, and gender and diversity are just a few examples where important elements of welfare cannot be fully captured by a single aggregated indicator such as GDP. During our meeting, we revisited this important agenda through a dialogue with Professor Joseph E. Stiglitz, and underscored the multidimensional aspects of welfare." The UN showed the idea of regarding the total value of artificial capital, human capital, and natural capital as "inclusive wealth" as an indicator to evaluate a stock. Also, the U.K. Treasury's "The Economics of Biodiversity: The Dasgupta Review" (2021) and other reports point out the importance of the idea.

[69] The First Basic Environment Plan states the need for an "economic system based on circulation."

[70] The purpose of this idea means that if "our values placing too much emphasis on the pursuit of material wealth, and the prevailing socioeconomic activities and lifestyles marked by mass-production, mass-

by protecting the biocapacity and improving the quality of the environment." The environment and the economy are no longer in conflict or contradiction, and the environment, or the foundation of society, and the economy built on the environment should be "synchronized" or "co-evolved."

Actions to address the environmental crisis should be based on the best available science, including efforts consistent with the 1.5°C target. Given the global race to build a sustainable socio-economic system to protect the foundation of human existence, whether or not the respective stakeholders can take actions at the speed and scale that meet the science will determine not only actions to address the environmental crisis, but also the result of that race.

Based on the current situation and awareness of the issues described above, the "critical 2030" may also apply to II2ES. The Plan will clarify the future direction of environmental policy development, with the environment at its core, aiming for the "sophistication" of II2ES and the realization of a sustainable society in which citizens now and in the future can enjoy a high quality of life with hope for tomorrow.

4. Review of environmental efforts in the past 30 years and awareness of challenges therein

The Plan is formulated exactly 30 years after the formulation of the first one in 1994. Therefore, we will review the major history, findings, lessons learned, etc. related to environmental issues and environmental administration for the past 30 years or so, and use these results in formulating and implementing future measures.

(1) Establishment of the concept of sustainable development and development of an international framework

In the 1980s, global environmental issues, such as climate change, ozone layer depletion, biodiversity loss, desertification, and tropical deforestation, rapidly became recognized as major themes. Against this backdrop, the concept of "sustainable development"[71] was proposed in a report issued by the Brundtland Commission in 1987 and included in the

consumption, and mass-disposal" continue, we will run into biocapacity.

[71] The Brundtland Report ("Our Common Future," 1987) defines that "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Rio Declaration on Environment and Development at the UN Conference on Environment and Development in 1992 (Rio de Janeiro Earth Summit), and the concept of sustainability spread throughout the world. In Japan, this "sustainable development" is the basic direction not only of the Basic Act on the Environment (Act No. 91 of 1993), which was enacted in 1993, but also of a series of the Basic Environment Plans under the Basic Act.

In order to achieve sustainable development, it is necessary to overcome structural problems in the socio-economic system (including culture, lifestyle, etc.) that underlie environmental issues. The First Basic Environment Plan specifically states that "the concept of mass production and mass consumption, which has been focused on in the pursuit of material wealth, must be addressed." The First Basic Environment Plan raises a fundamental problem, namely that "There is a growing need to reconsider our values placing too much emphasis on the pursuit of material wealth, and the prevailing socioeconomic activities and lifestyles marked by mass-production, mass-consumption, and mass-disposal." This problem awareness continues to be the core of the second and following plans.

Global environmental issues are common challenges for all humankind, and they should be addressed through cooperation among countries as they cannot not be solved by a single country. In other words, without cooperation among countries, each country cannot preserve its own environment or protect its own people's lives and property.[72] After the 1980s, international frameworks for global environmental conservation were rapidly developed in various fields, such as the UN UNFCCC (1992) and the Convention on Biological Diversity (CBD) (1992). Furthermore, the UNFCCC Third Session of the Conference of the Parties (hereinafter referred to as "COP3") held in Kyoto in December 1997 adopted the "Kyoto Protocol." This protocol became an important step toward concrete reduction actions, such as imposing binding obligations for greenhouse gas emissions reduction on developed countries, which were the emitters of the majority[73] of

[72] Global society developed the following protocols: Vienna Convention for the Protection of the Ozone Layer (1985); Montreal Protocol on Substances that Deplete the Ozone Layer under the Vienna Convention (1987); Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989); Protocol on Environmental Protection to the Antarctic Treaty (1991), United Nations Convention to Combat Desertification (1994); Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998); Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2000); and Stockholm Convention on Persistent Organic Pollutants (2001).

[73] In 1997, when the Kyoto Protocol was adopted, developed countries (Annex I countries) were the emitters of about 64% of global CO_2 emissions.

global greenhouse gas emissions.[74] However, some issues remained, such as not imposing reduction obligations on developing countries. Looking at the effort under the CBD, the CBD 10th Conference of the Parties (hereinafter referred to as "COP10") was held in 2010, and member countries agreed to implement effective and urgent actions to halt biodiversity loss by 2020, established the Aichi Biodiversity Targets as specific action goals, and adopted the Nagoya Protocol, which stipulates procedures to ensure the steady implementation of a fair and equitable sharing of benefits brought about by the utilization of genetic resources.

One of the major movements in Japan in response to the advancement of the international frameworks is the establishment of the "Act on Promotion of Global Warming Countermeasures" (Act No. 117 of 1998; hereinafter referred to as the "Global Warming Countermeasures Act") in 1997 and the establishment of the Climate Change Adaptation Act (Act No. 50 of 2018) in 2018. In addition, the Basic Act on Establishing a Sound Material-Cycle Society (Act No. 110 of 2000) was established in 2000, leading to the subsequent development of various recycling legislative systems,[75] and the Basic Act on Biodiversity (Act No. 58 of 2008) was established in 2008.

(2) Emerging global environmental crisis and SDGs, and the adoption of the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework, etc.

The IPCC Third Assessment Report (2001) was the first IPCC report to mention the observed impacts of climate change, and the IPCC AR6 Synthesis Report (2021-2023)

[74] During the first commitment period, all 23 member countries, including Japan, achieved their reduction targets (excluding Canada, which withdrew midway through the period). The IPCC AR4 Summary for Policymakers states that "There is high agreement and much evidence that notable achievements of the UNFCCC and its Kyoto Protocol are the establishment of a global response to climate change, stimulation of an array of national policies, and the creation of an international carbon market and new institutional mechanisms that may provide the foundation for future mitigation efforts."

[75] The waste disposal systems were strengthened to deal with large-scale illegal dumping. As a result, the number of new cases found as such dumping significantly decreased compared to around 2000, when it reached its peak. However, in addition to these efforts to improve legal systems for recycling, the proper disposal of waste that is generated in everyday lives and industrial activities remains important. Moreover, based on the 3Rs (reducing, reusing and recycling waste materials) plus Renewable (making biomass and using recycled materials) approach, efforts to promote a circular economy, in which resources are used efficiently in a circular manner throughout the entire lifecycle of the market,* also contribute to reducing greenhouse gas emissions and securing resources. For this reason, in recent years, the transition of society to a circular economy has been considered important from the perspective of measures against climate change and economic security.

*Note: This includes not only the product lifecycle, but also the conversion of biomass resources and unused resources into energy, and the creation of resources using bio-manufacturing technologies and carbon recycling technologies.

specified for the first time that anthropogenic climate change has caused "widespread adverse impacts and related losses and damages" to nature and people with an increase in the frequency and intensity of extreme events. Losses and damage are expected here to increase further as climate change progresses. Furthermore, environmental risks tend to become a high-ranking topic ceaselessly appearing in a series of the "Global Risks Report," annually published by the World Economic Forum (Davos) since 2011.[76]

SDGs set forth in the 2030 Agenda for Sustainable Development present a number of goals and targets related to the challenges in the global environment and issues closely related to the global environment, and expressed a sense of worldwide environmental crisis for the sustainability of the global environment.

The Paris Agreement adopted in December 2015 aims to curb an increase in the global average temperature to well below 2°C and to pursue efforts to curb it to 1.5°C, and to these ends, to achieve net-zero anthropogenic greenhouse gas emissions (i.e., striking a balance between anthropogenic greenhouse gas emissions and removals) in the second half of this century.[77] This became a turning point toward the building of a decarbonized society worldwide. In order to achieve the Paris Agreement target, cumulative anthropogenic emissions based on sinks must be kept below a certain amount, and it is important for Japan to move forward with rapid greenhouse gas emissions reductions based on the best available science.

The "Special Report on Global Warming of 1.5°C" issued by the IPCC in 2018 states that there are significant differences at 1.5°C versus 2°C of global warming in terms of average temperature rise, more extreme temperatures, heavy precipitation events, and an increased risk of drought in some regions and that under the emission pathways to achieve 1.5°C, global anthropogenic CO_2 emissions will reach net-zero around 2050. Furthermore, the UNFCCC 26th Session of the Conference of the Parties (hereinafter referred to as "COP26") agreed that the impact of climate change will be much lower at a temperature increase of 1.5°C compared with 2°C and resolves to pursue efforts to limit the temperature increase to 1.5°C.

[76] The trend remained the same even during the COVID-19 pandemic, and environmental risks marked the 4th place in all topics in the Global Risks Report 2024.

[77] With regard to significant long-term reductions in greenhouse gas emissions, in response to the IPCC Fourth Assessment Report, the G8 Hokkaido Toyako Summit Leaders Declaration in 2008 included the need for achieving at least a 50% reduction of global emissions by 2050.

In 2020, Japan declared "net-zero greenhouse gas (GHG) emissions by 2050," namely a goal of reducing its greenhouse gas emissions to net zero by 2050. Japan also set the targets of a reduction of greenhouse gas emissions by 46% in FY2030 (from the FY2013 level) and of continuing strenuous efforts in its challenge to meet the lofty goal of cutting its emission by 50%.

Before and after this, many countries and regions around the world similarly announced their commitments to achieving net-zero GHG emissions with a certain timeframe, such as 2050, and as of December 2023, these commitments account for 87% of the world's GDP.[78] While some progress has been made in efforts for mitigating climate change, the IPCC AR6 Synthesis Report released in March 2023, explains that, based on the data suggested by the Nationally Determined Contributions (NDCs) published by October 2021, greenhouse gas emissions worldwide in 2030 are expected to increase global warming by 1.5°C or higher during the 21st century, indicating the need to reduce GHG emissions by about 43% by FY2030 from the 2019 level in order to limit warming to 1.5°C. However, efforts to achieve the 1.5°C target fall far short. Accordingly, rapid, deep and sustained reductions in global greenhouse gas emissions are necessary to reach a peak of global emissions by 2025. The G7 Hiroshima Leaders' Communiqué states that "our goal to achieve net-zero greenhouse gas (GHG) emissions by 2050 at the latest remains unchanged" and that "we highlight the increased urgency to reduce global GHG emissions by around 43 percent by 2030 and 60 percent by 2035, relative to the 2019 level." The communiqué also expresses that "we reaffirm our commitment to achieving a fully or predominantly decarbonized power sector by 2035, and prioritizing concrete and timely steps towards the goal of accelerating the phase-out of domestic unabated coal power generation in a manner consistent with keeping a limit of 1.5°C temperature rise within reach and urge others to join us" and also that "we underline our commitment, in the context of a global effort, to accelerate the phase-out of unabated fossil fuels so as to achieve net-zero in energy systems by 2050 at the latest in line with the trajectories required to limit global average temperatures to 1.5°C above preindustrial levels, and call on others to join us in taking the same action."

COP28, held in 2023, adopted the first global stocktake to assess progress made in the measures against global climate change under the Paris Agreement. It emphasized the need for urgent actions to achieve the 1.5°C target and recognized the need for global emissions to peak by 2025. As specific actions to achieve this goal, the conference

[78] COP28.

decided on the following: formulating emission reduction covering all sectors and greenhouse gases; tripling renewable energy capacity globally and doubling the global average annual rate of energy efficiency by 2030; accelerating efforts towards the phase-down of unabated coal power; transition away from fossil fuels in energy systems; promoting decarbonization and low-carbon technologies; and transitioning to sustainable lifestyles and sustainable consumption and production patterns. Parties to the Paris Agreement have been encouraged to submit their next NDCs by 2025 based on these outcomes.

Even if global warming is limited to about 1.5°C, its effects are inevitable, and the frequency and intensity of extreme temperatures and heavy rainfall are projected to increase. Globally, heat waves are causing some regions to record new daily maximum temperatures, and heavy rainfall and flooding are reported to cause extensive damage not only to human lives but also to socioeconomic activities.

Measures to mitigate and adapt to climate change as well as to address loss and damage associated with the adverse effects of climate change, which are efforts to avert and minimize damage that people face now or are expected to face in the future, are also urgent challenges. The IPCC AR6 Synthesis Report focuses on society's choices and actions to be taken in the next decade and points out the importance of advancing "climate resilient development" that implements options for the mitigation of and adaptation to climate change.

According to the IPBES Global Assessment Report on Biodiversity and Ecosystem Services published in 2019, biodiversity and ecosystem services worldwide have still been degrading and we are now considered to be living in the sixth mass extinction period. The report identifies the direct causes of such biodiversity loss, starting with those with most impact, as [i] changes in land and sea use, [ii] direct exploitation of organisms, [iii] climate change, [iv] pollution, and [v] invasion of alien species (Items [i] and [ii] are reversed for the sea.) The report also points out that a "transformative change" across economic, social, political, and technological fields is necessary to dramatically reduce the direct and indirect causes of nature degradation and to halt and recover biodiversity loss.

Furthermore, the "Global Biodiversity Outlook 5" (GBO5) released by the Secretariat of the Convention on Biological Diversity (CBD) in 2020 assesses the Aichi Biodiversity

Targets and states that none of the 20 targets have been fully achieved, though most of the targets have made significant progress, indicating that in order to put biodiversity loss on a recovery track, integrated efforts, in addition to nature conservation measures, are needed to address climate change, pollution, invasive alien species, overexploitation, and sustainable production and consumption. Around the same time, the UN Summit on Biodiversity was held in September of the same year. In response to the critical situation of biodiversity, the first initiative on biodiversity was launched, calling on leaders from around the world to participate, and member countries began signing the "Leaders' Pledge for Nature," which sets out 10 commitments based on a nature positive approach. Japan as well announced its participation in May 2021. As a new global framework to replace the Aichi Biodiversity Targets, a group of countries that called for the positioning of ambitious targets, such as the 30by30 target that aims to conserve at least 30% of land and sea by 2030,[79] came together and launched the "High Ambition Coalition for Nature and People" in January 2021, and Japan as well announced its participation in the coalition. Following these various international commitments and initiatives, the Kunming-Montreal Global Biodiversity Framework was formulated in 2022, stating the 2050 goal of "prosper with nature" and the 2030 mission for this goal of "To take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery," which is a so-called nature positive approach. In addition to the four 2050 global goals, the framework sets 23 global targets, including eight numerical targets represented by the 30by30 targets, to achieve the 2030 mission and shows a strengthened review (evaluation) mechanism.

Forest development, climate change, and other disasters seen worldwide have increased the risk of animal-borne infectious diseases. In addition, globalization has led to the spread of zoonoses across borders and throughout the international community. As a recent case, in January 2020, the World Health Organization (WHO) declared a "public health emergency of international concern (PHEIC)" for the COVID-19 pandemic. In addition, these infectious diseases may cause a significant impact not only on human

[79] Regarding the significance of conserving more than 30% of land and sea, some point out, as an example of international scientific findings, that in order to protect many of the world's land-dwelling mammal species, it is necessary to expand the existing wild protection area to 33.8% of the entire land area, and some research reports state that, in order to conserve amphibians, birds, mammals, and others around the world, 26 to 28% of the world's land area should be conserved. Concerning the oceans, a review of 144 existing studies, for example, found that the majority of the studies concluded that more than 30% of the oceans should be protected and that on average, 37% of the world's oceans need to be protected. Looking at scientific findings in Japan, one research report states that, with regard to land areas, if the wild protection areas in Japan are effectively expanded from the current 20.5% of the national land area to 30%, the risk of extinction of living organisms is expected to decrease by 30%.

health and socioeconomic activities, but also on biodiversity conservation.[80] To solve these issues, a One Health approach has been proposed. This is an approach to integrally making efforts to achieve human health, animal health, and environmental soundness, which are essential elements interconnected to each other.

(3) Challenges in material extraction and processing

"Global Resource Outlook 2024" report issued by the International Resource Panel (IRP) in 2024 clearly shows the environmental impacts of material extraction and processing. Looking at environmental impacts worldwide, the extraction and processing of natural resources (fossil resources, minerals, non-metallic minerals, and biomass) into materials, fuels, and food as well as related land uses account for 55% or more of global GHG emissions (excluding climate impacts related to land use),[81] 90% or more of biodiversity loss and water stress factors, and 40% or more of particulate substances causing health impacts.[82] As some point out, the climate and biodiversity impacts of this extraction and processing far exceed the goals of limiting climate change to less than 1.5°C and preventing biodiversity loss.

The report shows that the economic system for material extraction and processing is closely linked to the major environmental problems of climate change, biodiversity loss, and pollution. This means that multiple major environmental problems can be addressed simultaneously if material extraction is reduced as much as possible by shifting to a circular economy and creating an economic system that uses resources more efficiently.

The report also points out that during around 50 years from 1970 to 2017, annual global material extraction nearly tripled from 27 billion tons to 92 billion tons as the population

[80] For example, highly pathogenic avian influenza caused the mass deaths of more than 1,500 wild birds in Izumi City, Kagoshima Prefecture, from 2022 to 2023. In addition to birds, the mass deaths of mammals and the cases of human infection were confirmed overseas.

[81] The IRP calculates that the figure is 60% or more if climate impacts related to land use are included.

[82] In individual sectors, for example, it is noted that food production is a major cause of most biodiversity loss and soil erosion, accounting for a large portion of GHG emissions. Moreover, some point out that between 2000 and 2015, the number of cases reported as climate change and health impacts caused by metal mining and production nearly doubled. The IPCC Special Report "Climate Change and Land" (2019) as well estimates that GHG emissions from the entire food system, including food production, processing, distribution, preparation, and consumption, account for 21% to 37% of the total global GHG emissions. It should be noted that the IPCC "Sixth Assessment Report; Working Group III; Climate Change 2022: Mitigation of Climate Change" states that "Demand-side and material substitution measures, such as shifting to balanced, sustainable healthy diets, reducing food loss and waste, and using bio-materials, can contribute a 2.1 [1.1–3.6] $GtCO_2$-eq yr^{-1} reduction."

doubled and it still continues to increase, and that, in light of these trends, the use and environmental impact of natural resources and the decoupling of economic activity and human happiness are essential elements in the transition to a sustainable future.

In recent years, in light of the IRP report and other documents, the UN, G7, G20, and other international forums have been holding discussions on the decoupling of natural resource use and environmental impacts from economic growth as well as on the circular economy and resource efficiency as important tools for addressing major environmental challenges. For example, the Communiqué issued at the G7 Ministers' Meeting on Climate, Energy and Environment in Sapporo in 2023 highlighted the importance of decoupling economic growth from environmental degradation and primary resource use. We emphasize that enhancing resource efficiency and circularity along value chains, guided by scientific data and findings, reduces primary resource use and supports our efforts to address the triple crisis (climate change, biodiversity loss, and pollution).

(4) Changes in the natural environment of the Japanese land

Looking at the Japanese land, under the series of the Comprehensive National Development Plans, Japan, mainly until the 1990s, conducted large-scale development projects and regional improvements across the country to achieve balanced development among regions, create rich environments, and build multi-polar, decentralized national land.

For example, the Comprehensive National Development Plan (the first plan) in 1962 explains the basic direction of factory development, stating that "factories should be located in a centrifugal manner, centered on good harbors or other areas where good harbors can be constructed. Companies in the steel, oil refining, and other industries should seek new locations with excellent natural location conditions, such as land, water supply, and harbors." Based on this, heavy chemical industries, such as steel and petrochemicals, which depend on overseas resources and require wide land and large port facilities, were concentrated in the Pacific Belt zone, which is adjacent to large consumption areas and has good ports.[83] As seen above, the Japanese land structure up to the present was developed on the premise that a large amount of fossil fuels and other underground resources are imported from overseas countries and used.[84]

[83] Ministry of the Environment, "Annual Report on the Environment 1987" (1987).
[84] In the Meiji and Taisho periods, many factories were located relatively close to hydroelectric power

After the period of rapid economic growth, quick and large-scale development and modification progressed throughout Japan. According to the "Japan Biodiversity Outlook 3" (JBO 3), the scale and quality of forests with a high naturalness, farmlands, wetlands, and tidal flats significantly reduced over the past 50 to 20 years, and the vegetation that has not been artificially altered now covers less than 20% of the Japanese land. The risk of species extinctions is also increasing in terrestrial and aquatic ecosystems. More than 50% of the vertebrates listed on the Red List 2020 of the Ministry of the Environment, Japan, are terrestrial and aquatic species that depend on freshwater ecosystems for all or part of their lives. For example, *medaka*, or killifish (northern and southern killifish), once the most familiar fish found throughout Japan, is now listed in Endangered Class II of threatened species of the Red List 2020 (i.e., a species at increasing risk of extinction).

Biodiversity loss is affecting our lives in the form of reduced ecosystem services. According to the "State of World Fisheries and Aquaculture 2022" published by the UN Food and Agriculture Organization (FAO) in 2022, global fishery resources continue to decline due to overfishing and pollution, and marine ecosystems are vulnerable to various environmental changes, including climate change.[85] In addition, there are concerns about the impact of plastic pollution on ecosystems. Moreover, the number of victims of landslides has been on the increase in the last 20 years, partly due to the increase in and intensification of heavy rainfall, but some concern that the multifaceted functions of forests, such as disaster prevention and mitigation, may not fully work where insufficient care is seen due to the declining and aging population and sika deer cause severe damage to the understory vegetation. Furthermore, the flood control function of wetlands is also thought to be declining due to the significant decrease in the area of wetlands.

Satochi-Satoyama (community-based forest areas and the surrounding countryside) are important areas for biodiversity conservation in Japan, but structural socioeconomic changes over the past 50 years, such as population decline and changes in demand for agriculture and forestry, have led to a decline in the traditional use of Satochi-Satoyama.[86]

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plants (Ministry of Land, Infrastructure, Transport and Tourism, "National Land Information: Power Plants Data" and "National Land Information: Railway Time Series Data"; Ministry of Economy, Trade and Industry, "Census of Manufacture" (1925); and Hokkai-Gakuen University; Journal of Business Administration, "Study on the Development of the Japan Electrical Power in the Period of Water-Power Electricity" (September 25, 2009)).

[85] The catch of Japan's marine fisheries dropped to about 50% of its peak, and that of inland fisheries to about 20%, showing a particularly large decline in the last 20 years.

[86] The area of abandoned land in 2015 was about three times as large as that in 1975 (Ministry of Agriculture, Forestry and Fisheries, "Census of Agriculture and Forestry in Japan").

Approximately 70% of amphibians, brackish/freshwater fish, and insects, which are listed as threatened species in Japan, are considered to be distributed in the secondary nature. As seen in the fact that some animals and plants, such as *tagame* (giant water bugs) and *gengoro* (diving beetles), which once lived and grew in Satochi-Satoyama that was familiar to people, are listed in Endangered Class II of threatened species of the Red List 2020 and are threatened with extinction, this decline is one of the factors causing the loss of biodiversity in Japan. Furthermore, as abandoned farmlands and unused Satoyama forests have been becoming favorable habitats for wildlife and the hunting pressure has been decreasing due to the decrease and aging of hunters, the number of sika deer and wild boar is increasing[87] and their habitats are expanding, and this causes a serious impact on the ecosystem and serious damage to agriculture and forestry. In addition, the impact of alien species on local ecosystems, biodiversity, and human living environments is also growing. These are multilayered regional issues, such as threats to the development of safe and secure communities and, ultimately, the degradation of local communities.

In recent years, against the backdrop of environmental problems, declining population, and changing values, the perspectives of creating multinatural habitat areas, creating sustainable regions, and creating beautiful and livable national land has been added to the development of national land. As a result, the pressure on ecosystems due to development and alteration has decreased over the last 20 years compared to the period of rapid economic growth and the bubble economy, but relatively small-scale alterations still continue to occur. In addition, not a small number of communities have faced conflicts from the perspective of the impact on the natural environment and living conditions when companies intend to install renewable energy generation facilities in the communities. The key issue is how to introduce the necessary amount of renewable energy and achieve harmony with nature toward the goal of net-zero emissions by 2050.

The new National Spatial Strategy, on which a Cabinet Decision was made in July 2023, aims to promote the creation of a unique country with beautiful, world-class nature and diverse cultures. In order to realize the 30by30 target toward the Nature Positive initiative, the "creation of green national land" is an important theme, which will be achieved by promoting the conservation and restoration of healthy ecosystems and the formation of wide-area ecosystem networks through the expansion of national parks and other protected areas and the establishment and management of other area-based effective

[87] Backed by enhanced trapping measures conducted in recent years, the estimated populations of sika deer and wild boar are currently on a downward trend.

conservation measures (OECM) and also by promoting efforts to solve community issues by utilizing the power of nature through green infrastructure.

(5) Changes and challenges in environmental pollution and chemicals management

In Japan, measures taken against the severe pollution that once occurred nationwide have achieved a certain degree of success. For example, concerning the problem of Minamata disease, which was officially recognized in 1956 and is said to be the starting point of environmental administration, victims were recognized and compensated under the Act on Compensation for Pollution-related Health Damage (and under its predecessor, the Law Concerning Special Measures for Relief of Pollution-related Patients), and relief was provided to victims through political settlements in 1995 and again in 2009. Although efforts were made to improve medical care, welfare, and community development (*moyai-naoshi*, or rebonding), applications for recognition and lawsuits are still ongoing, and the problem of Minamata disease has not ended yet. In addition, we should continue to tackle certain issues including the following: the low rate of achievement of environmental quality standards for e.g., photochemical oxidants and Shinkansen railway noise; the maintenance and restoration of water pollution, healthy water circulation, and material circulation in lakes and enclosed sea areas; the revision of environmental quality standards; and the setting of environmental targets for hazardous air pollution substances. Meanwhile, new challenges have been appearing including the following: striking a balance between climate change countermeasures, e.g., the promotion of introduction of renewable energy and other non-fossil energy, and conservation of water and air quality; consideration of how environmental quality standards should be tailored to community needs; creation of a good environment; and perfluoroalkyl substances and polyfluoroalkyl substances (PFAS), which are substances detected from some areas with relatively high concentrations of perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) and recently attracting people's interest.[88]

In addition, global pollution has been becoming more serious due to the following substances: reactive nitrogen, which exists across various media in the environment, including water and air; plastic debris, including microplastics; anthropogenic mercury emissions; and chemicals that are persistent, highly accumulative, toxic, and have the potential for long-range transport. This raises concerns about the impact on health and ecosystems through water, air, and the food chain. Concerning plastic pollution,

[88] Generic name for perfluoroalkyl compounds and polyfluoroalkyl compounds.

discussions to "end plastic pollution" are underway at the Intergovernmental Negotiating Committee (INC), which was resolved to be established in March 2022 and was launched in November of the same year, to develop an international legally binding instrument (treaty). As seen in this case, international efforts to address plastic pollution are spreading. As for nitrogen, international discussions on sustainable nitrogen management are underway to achieve a significant reduction by 2030. Meanwhile, from the perspective of domestic nutrient management, some experts say that the supply of nitrogen and phosphorus is sometimes necessary to achieve a "clean and rich sea." Regarding mercury and toxic chemicals, international efforts are being made based on the Minamata Convention on Mercury and the Stockholm Convention on Persistent Organic Pollutants.

In the field of chemicals management, the First Basic Environment Plan (1994) set the concept of "environmental risk" of chemicals, and the Second Basic Environment Plan (2000) clearly stated the directions of reducing environmental risks by using various measures, such as the combination of voluntary efforts and regulations, taking into consideration hazards and exposure. Since then, the measures combining regulatory and voluntary control were taken, and efforts to collect scientific knowledge and risk assessment were promoted. In addition, the Third Basic Environment Plan (2006) pointed out the need for measures tailored to each stage of the life cycle, ranging from manufacture to import to use to recycling to disposal, and Japan took efforts in accordance with the respective laws and regulations. However, the Global Chemicals Outlook II published by the UN Environment Programme (UNEP) in April 2019 assessed that the goal of the Political Declaration and Implementation Plan adopted at the 2002 World Summit on Sustainable Development in Johannesburg, namely "to achieve, by 2020, that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment," would be difficult to achieve. The report projected that the scale of global chemicals markets would double by 2030. The life cycle flow of chemicals, along with the accelerating global transition to a circular economy, requires chemical management that takes into account recycling rather than a one-way process from production to use and disposal. In addition, new issues, such as perfluoroalkyl substances and polyfluoroalkyl substances (PFAS), have emerged in Japan and abroad, and, as some point out, it is necessary not only to collect information on the assessment and exposure of the respective hazard substances but also to take action on a substance group basis. Amid international efforts underway to develop new evaluation methods that take into account animal welfare and other aspects and to harmonize the classification schemes of hazard substances, Japan needs to advance an integrated study

of how it should manage chemicals, taking into account international trends. Looking at the overseas efforts, some countries have been conducting epidemiological surveys that contribute to the clarification of the effects of chemicals on health. Meanwhile, Japan has been conducting a large-scale epidemiological survey called "Japan Environment and Children's Study (JECS)" with the cooperation of approximately 100,000 pairs of parents and children, and the results of this survey are expected to be put to effective use.

In addition to regulatory approaches based on treaties and other instruments, as a new international trend, the "Global Framework on Chemicals (GFC) - For a Planet Free from Harm of Chemicals and Waste," the successor to the Strategic Approach to International Chemicals Management (SAICM), was adopted at the 5th session of the International Conference on Chemicals Management (ICCM5) held in September 2023. This framework is a voluntary initiative formed through a multi-sectoral and multi-stakeholder approach to address the three crises of climate change, biodiversity loss, and pollution in which coordination and collaboration are strengthened among stakeholders and all stakeholders, not just government agencies, are encouraged to take ownership of their actions. In light of the concept of "a planet free of harm from chemicals and waste for a safe, healthy and sustainable future" set out here and the concept of planetary health set out in Part 1 as well as based on the international scientific knowledge gained at a Science-Policy Panel to Contribute Further to the Sound Management of Chemicals and Waste and to Prevent Pollution, whose establishment is now under negotiation, and other bodies, we need to contribute to decarbonization, the circular economy, and even the goals of the Kunming-Montreal Global Biodiversity Framework.

(6) Flow toward integration and synergy of individual environmental policies, etc.

Environmental problems are not limited to measures against specific sources of pollution. As exemplified by climate change issues and biodiversity loss, economic and social systems and lifestyles need to be reviewed in order to solve the problems, and coordination among individual environmental policies has become necessary. The Fourth Basic Environment Plan (cabinet decision on April 27, 2012) aimed for the integrated achievement of the three fields of "low carbon," "circulation," and "harmony with nature," on the premise that "safety" is secured. The Fifth Basic Environment Plan, under the six priority strategies for the realization of a circulation and symbiosis based society while also including the perspective of the simultaneous solutions to economic and social challenges, presented the concept of a Circular and Ecological Economy, which works

not only as a policy for further specifying the approaches to integrated implementation of measures and but also as an opportunity for people in local communities to put these policies into practice.

Sustainable Development Goals (SDGs), a group of interrelated 17 goals and 169 target, are characterized by aiming to solve multiple issues in an integrated manner and to achieve multi-benefits, where a single action generates multifaceted benefits.

Furthermore, the G7 Hiroshima Leaders' Communiqué and the Communiqué issued at the G7 Ministers' Meeting on Climate, Energy and Environment in Sapporo in 2023 called for shifting the socio-economic system to a net-zero (decarbonization), circular, and nature-positive economy to address the triple global crisis of climate change, biodiversity loss, and pollution. They also stated that member countries should recognize the interdependence of the challenges and leverage synergies.

(7) Importance of using the best available scientific knowledge

Article 4 of the Basic Act on the Environment stipulates that the environment must be conserved "with the aim of preventing a hindrance to the environmental conservation based on the broad-based scientific knowledge."

Historically, the best available scientific knowledge at the time played an important role. For example, the discovery of the so-called "ozone hole" by the Antarctic Regional Expedition of Japan is known to become a trigger to accelerate subsequent international efforts to protect the ozone layer.

In addition, as mentioned earlier, various IPCC and IPBES reports made significant impacts on the international community.[89] Of these, the IPCC's assessment of anthropogenic climate change impacts was limited to stating in its First Assessment Report (1990) that "… resulting on average in an additional warming of the Earth's surface." Subsequent reports gradually increased the level of confidence, leading to the conclusion in the IPCC's Sixth Assessment Report that "It is unequivocal that human influence has warmed the atmosphere, ocean and land." In 1989, Yoshiro Manabe, who

[89] For example, social science findings described in "Stern Review: The Economics of Climate Change" (2006) and "The Economics of Biodiversity: The Dasgupta Review" (2021), both from the U.K., received international attention.

is the 2021 Nobel Prize laureate in Physics, conducted a simulation of the climate model shown in the Sixth Assessment Report, and the results are now found to be consistent with the trends of changes actually observed since then.[90] This demonstrates again the importance of taking advantage of the best available scientific knowledge and responding based on the precautionary approach concept.

(8) Changes and challenges in public consciousness

"In the postwar period of economic recovery and in the period of rapid economic growth in the late 1950's and 1960's, the top priority was placed upon expanding the economy: it was the society's goal on which people were united overall."[91] In these periods, some cities and schools established their songs that symbolize the prosperity of their areas where industrial activities were flourishing, such as smoke emitting from factories.[92] Through the subsequent experience of severe pollution and other events, citizens' demand for a better environment enhanced, and the importance of a comfortable environment (amenity) came to be recognized. In addition, behavioral restrictions associated with the COVID-19 pandemic were found to decrease the concentration of air pollutants in Tokyo as well as in other cities around the world, revealing that there is room for improvement in the air environment. Furthermore, the younger generation, known as Generation Z, is globally considered to be more aware of environmental issues and more proactive in taking actions to protect the environment. In Japan, the results of environmental education were confirmed to help form an awareness of environmental issues among the young generation.[93] As their interest in migrating to regional areas has been growing, one-third of all respondents to a survey, showing the largest rate, answered that "they considered low population density and a rich natural environment attractive" as the reason for their

[90] Stouffer, J. Ronald, and Syukuro Manabe, 2017: Assessing Temperature Pattern Projections Made in 1989.

[91] Ministry of the Environment, "Annual Report on the Environment1992" (1992).

[92] Examples include City Songs of: Yokkaichi City in Mie Prefecture, and the former Tobata City and the former Yahata City (both currently, Kitakyushu City) in Fukuoka Prefecture, and School Songs of: Fukagawa Daigo Junior High School in Koto-ku, Tokyo, Tanoura Elementary School in Mihara City, Hiroshima Prefecture, and Minamata Daini Elementary School in Minamata City, Kumamoto Prefecture. Regarding the School Song of Yokkaichi Minami High School, founded in 1959, some of the lyrics of the song were replaced at the 20th anniversary in response to the request of Shuntaro Tanikawa, the writer of the song, for fear that they might be seen as glorifying pollution.

[93] The Ministry of the Environment, "FY2020 Situational Survey on the Implementation of the Basic Policy under the Act on the Promotion of Environmental Conservation Activities through Environmental Education (Questionnaire Survey)" (March 2021), uncovered that respondents in the age bracket of 29 years old or younger accounted for the highest ratio in all age brackets in choosing the response item of "Because I have learned or received education about environmental issues at school" as the reason for becoming more conscious of environmental and social issues.

interest in such migration.[94] From the perspectives of responding to the demand of people and attracting highly skilled human resources from overseas, it is important for Japan to not only prevent hindrances to environmental conservation but also to take initiatives for the creation of a good environment.

In reality, however, the survey results show that the awareness of environmental issues among Japanese people is not always high compared to international standards and that the people feel to a lesser extent the sense of an environmental crisis from the current situation.[95] Answering the question of "What do you think is needed to take action for raising the awareness of environmental issues in society?" 43.1% of the respondents said "economic leeway," showing the highest rate, far ahead of other answers, as the survey uncovered.[96] Therefore, in order to increase public awareness of environmental issues, it is important to deepen public understanding of environmental issues and environmental conservation by providing environmental information and data and encourage people to participate in environmental conservation activities.

(9) Great East Japan Earthquake and accidents at TEPCO's Fukushima Daiichi Nuclear Power Station

[94] Cabinet Office, "The 6th Survey on Changes in Attitudes and Behaviors in Everyday Life under the Influence of the COVID-19 Pandemic" (April 2023).

[95] For example, according to the poll results released by the World Citizen Debate on Climate and Energy, Japan has a high percentage of citizens who view climate change action as a negative threat to their own lives. In addition, looking at a report on the longitudinal survey by the PEW Research Center titled "In Response to Climate Change, Citizens in Advanced Economies are Willing to Alter How They Live and Work" (September 14, 2021), the percentage of Japanese people who have concerns about the impacts of climate change declined. According to the public opinion poll in 2022, 29.4% of all respondents "knew" the meaning of the word "biodiversity" and 43.2% "did not know the meaning but had heard of the word," falling short of the target set in the National Biodiversity Strategy of Japan 2012-2020 of more than 75%, indicating that the public awareness and understanding of biodiversity is not yet sufficiently advanced. In addition, according to the 2021 Survey on Time Use and Leisure Activities, the percentage of people participating in "conservation and environmental activities" as a volunteer is 3%, down from 8% in 2001. Furthermore, Japan tends to show lower ratios than other environmentally-advanced countries in terms of people's willingness to purchase products from environmental companies and their willingness to pay higher for sustainable products (Documents distributed at the 108th meeting of the General Policy Committee of the Central Environment Council in June 2023; Data compiled by the MOE based on the data released by Intan-Invest, RIETI, "JIP Database 2018" and OECD Statistics).

[96] Ministry of the Environment, "FY2020 Situational Survey on the Implementation of the Basic Policy under the Act on the Promotion of Environmental Conservation Activities through Environmental Education (Questionnaire Survey)" (March 2021). Of the respondents, 25% selected "friends to work together," followed by 24.9% selecting "mental stability." A comparison among environmentally-advanced countries shows that a certain correlation is observed between GDP growth by country and changes in awareness of environmental issues (i.e., changes in the percentage of people who are very concerned about the impact of climate change on themselves). Among the countries for which data are available, Japan shows the lowest GDP growth and the lowest change in awareness of environmental issues.

The Great East Japan Earthquake was an unprecedented disaster that caused enormous damage and affected a wide range of areas. In particular, Fukushima Prefecture suffered serious and enormous damage not only from the earthquake and tsunami but also from radioactive materials due to the nuclear disaster that accompanied them. The efforts for environmental restoration became indispensable to promptly reduce the impact of environmental pollution caused by radioactive materials generated by the Great East Japan Earthquake and the accident at TEPCO's Fukushima Daiichi Nuclear Power Station (NPS), and in response, Japan has been conducting decontamination and treatment of specified wastes in the areas affected by the accident at TEPCO's Fukushima Daiichi NPS. As a result of these efforts, evacuation orders were lifted from all designated areas by March 2020, except for the Restricted Areas. Concerning the Restricted Areas, evacuation orders were lifted for the entire Specified Reconstruction and Revitalization Bases in six towns and villages (namely Katsurao Village, Okuma Town, Futaba Town, Namie Town, Tomioka Town, and Iitate Village) by November 2023. However, there are still challenges that need to be addressed, such as efforts for environmental regeneration, including initiatives to achieve final disposal of the removed soil and waste arising from decontamination activities (removed soil and waste) outside Fukushima Prefecture to other prefectures, and those for fostering nation-wide understanding of these initiatives. Moreover, Japan needs to promote future-oriented efforts to create and rediscover regional strengths from an environmental perspective, including decarbonization, resource circulation, and harmony with nature.

As the number of people who have returned to their hometowns has been growing in response to the lifting of evacuation orders from the Specified Reconstruction and Revitalization Base Areas, it is becoming important to provide such people with care for health concerns related to radiation caused by the nuclear disaster, not only through conventional risk communication with municipalities and counselors, but also through collaboration with the initiatives in which returning residents are proactively engaged in their own communities. In addition, Japan should continue to convey correct knowledge and information and conduct risk communication not only in Fukushima Prefecture but also in other prefectures as the efforts for alleviating concerns about the influence of radiation to people's health. At the same time, it is also necessary to hold dialogues, such as roundtable meetings, with residents to access the opinions of participants so as to leverage such opinions in future measures against radiation health concerns.

In addition, since the Great East Japan Earthquake, the importance of risk assessment and

the idea of precautionary approaches has been reaffirmed not only from the perspective of disaster prevention, but also in environmental policies. In the future, it will be important to promote policies by utilizing the concepts of "environmental risk" and "precautionary approaches" while conducting objective risk assessment based on scientific knowledge as much as possible.

For a secure and stable energy supply, which is the basis of social activities, people have been aware of decentralized and self-reliant energy systems as effective means after the Great East Japan Earthquake, and it is considered important to promote efficient energy use, make use of renewable energy and other resources existing in communities, and circulate resources.

Chapter 2. Basic concepts for the development of future environmental policies to build a sustainable society

1. The sustainable society we should aim for: Establishment of a "circulation and symbiosis based society" where environmental conservation and "well-being/quality of life" through it can be achieved

Reconsidering the provisions of Article 1 of the Basic Act on the Environment[97] in the context of the current situation, the purpose of environmental policies is environmental conservation that consists of "preventing hindrances to environmental conservation" and "creation of a good environment"[98] and the "quality of life, level of happiness, well-being and economic welfare of each person present and in the future" through conservation (hereinafter referred to as the “well-being/quality of life"), and this is a contribution to the welfare of humankind. While it goes without saying that "ensuring wholesome and cultured living of the people" is a prerequisite for the survival of citizens now and in the future in a situation where human activities have been exceeding the limits of the earth's biocapacity, the "well-being/quality of life" will not establish without our contribution to the welfare of humankind.

Under the current environmental crisis as described in Chapter 1 and in the situation where environmental, economic, and social aspects are intricately intertwined and where the state of the modern socio-economic system has been threatening the stability of the environment and natural capital, which is the foundation of human existence, securing the inheritance of a healthy and bountiful environment requires the implementation of economic and social activities within the biocapacity of the environment and the creation of a good environment. Accordingly, based on the nature positive approach, it is necessary to incorporate appropriate environmental considerations and a mechanism that improves the environment (e.g., incorporating environmental considerations from the early stages of planning and appropriately evaluating environmental values in markets) into a socio-economic system. The socio-economic system should be not only sustainable from an environmental perspective but also healthy and sustainable from an economic and social

[97] Article 1 of the Basic Act on the Environment stipulates that "The purpose of this Act is to promote policies for environmental conservation in a comprehensive and systematic manner so as to ensure wholesome and cultured living of the people present and in the future, as well as to contribute to the welfare of humankind" (excerpts).
[98] Article 3, Paragraph 1 of the Act for Establishment of the Ministry of the Environment (Act No. 101 of 1999).

perspective, thereby leading to "well-being/quality of life" as a whole.[99] A sustainable society can only be achieved if actions are undertaken to improve environmental, economic and social aspects in an integrated manner.[100]

Based on this, the sustainable society to be aimed for in the Plan, which further develops the concept of a "circulation and symbiosis based society" presented in the Fifth Basic Environment Plan, is as follows.

For building a sustainable society, we should choose actions in accordance with the principles of nature based on circulation and symbiosis so that we can maintain and restore the environment and natural capital, which is the foundation of human existence, in a healthy form, keep flexible to change, and receive the blessings of the environment and natural capital in the future.

The environment consists of the circulation of substances (including element-level ones, such as carbon and nitrogen) through the atmosphere, water, soil, and living organisms via photosynthesis, food chains, etc. (the "circulation" of substances and life), in which the entire earth or a specific system, including people as a part, strikes the balance. However, our economic activities have resulted in the exploitation of resources beyond the earth's environmental capacity. There has also been an excessive impact on the environment from discharged substances. As a result, the delicate balance among ecosystems has been broken. This imbalance has manifested in the form of climate change, biodiversity loss, and pollution, and the human environmental loads have already been exceeding the earth's biocapacity.

To solve this problem, it is indispensable to realize a "socio-economic system based on the circulation of materials."[101] In order to protect biocapacity, we should place the so-called "renewable resources," such as recycled resources and biomass resources[102] as a

[99] The Third Basic Environment Plan states that "the 'sustainable society' goal of this plan is a 'society in which a sound and productive environment is maintained both globally and regionally; each and every citizen can enjoy such an environment and an appreciably happy life from it; and further, that they can hand these things down to future generations.'"

[100] The Fifth Basic Environment Plan points out that the "basic relationship among the goals of SDGs could be understood as follows: the role of the environment is to function as the foundation, upon which socio-economic activities are carried out on a sustainable basis." If the increase in environmental loads causes natural capital to fall below a critical level, the very existence of humankind, including the sustainability of economic society, could be threatened.

[101] The First Basic Environment Plan.

[102] This plan uses renewable resources and energy as a symbol of renewable energy, and does not deny the existence of underground resources, such as renewable geothermal energy.

keystone and aim to promote resource circulation, reduce our dependency on underground resources[103] consisting of fossil fuels and others, and make less new inputs to the maximum extent possible. It is also important to reduce the total amount of environmental loads in light of the relationships among sectors, including synergetic or tradeoff relationships. Furthermore, we should prevent the degradation of the environment and natural capital, which is the basis for the survival of humankind, and maintain the environment well above the critical level of environmental biocapacity. In addition, we need to improve the quality of "circulation" by restoring the linkage between forests, countryside, rivers, and the sea, proactively restore and improve natural capital through nature-positive and other approaches, and facilitate the sustainable use of materials. In this way, environmental conservation consisting of "prevention of hindrances to environmental conservation" and "creation of a good environment" will be realized.

The term "symbiosis" here means a state in which people are part of the environment, people are part of living organisms, and people, living organisms, and the environment are inseparably interacting with each other, namely a state in which people are not a special entity in the ecosystem or the environment, but a healthy member therein. We Japanese have historically cultivated wisdom and a view of nature that allows us to live in harmony with nature in a way that does not consume all of our natural capital through trial and error, while maintaining a sense of awe toward nature, rather than having the idea of overcoming and controlling nature that brings us abundant blessings while threatening us from time to time. However, as discussed in Chapter 1, humanity as a whole, including the Japanese people, is now a unique entity in the ecosystem or the environment. To achieve "symbiosis," it is hoped that there will be a shift to an economic society in which human activities do not damage the ecosystem and actually enrich it. As mentioned in Chapter 1, the concept of "planetary health," which integrates the health of the earth and the health of people, has been gaining importance in recent years.

What kind of awareness each individual has and how they act will lead to the collective efforts of local communities and companies, the ideal state of the economy and society of Japan as a whole, and the future of the entire planet, which draws a relationship of a

[103] The term "underground resources" refers to depletable underground resources, such as fossil fuels and mineral resources. Underground resources do not include aboveground resources that have already been used (e.g., so-called "materials recovered by urban mining") or underground renewable energies (e.g., geothermal energy). It should be noted that some underground resources, such as important minerals necessary for net-zero emissions, require an enhanced supply capacity.

concentric circle consisting of individuals, communities, companies, countries and the earth.

Moreover, as exemplified in the Fifth Basic Environment Plan, promoting symbiosis between communities is considered important in addition to that between nature and people. Reflecting on the provisions of Article 1 of the Basic Act on the Environment, symbiosis of the environment with each person, with the present and future generations (ensuring intergenerational equity), and with humankind (or the world) is also required.

This realization of "circulation" and "symbiosis," coupled with the use of digital transformation (DX), will lead to a change in the socio-economic system to build a civilization in which "an economic society can grow and develop by protecting the biocapacity and improving the quality of the environment." Reducing Japan's dependency on other countries' natural capital, such as food, energy, and resources, will help mitigate climate change, biodiversity loss, and pollution crises worldwide and will also contribute to the security of Japan. This kind of circulation and symbiosis based society ("Environmental and Life Centered Civilized Society") provides a vision of a sustainable society that Japan can aim for, and Japan will strive to make efforts so that citizens now and in the future in Japan can or will be able to achieve "well-being/quality of life" with hope.

Japan as a whole should shift to this circulation and symbiosis based society and realize the "well-being/quality of life" of each person present and in the future, and to this end, we should focus on communities, which are the living environment for people and the basis of our nation's land and socio-economy, and encourage community residents to envision and realize a future vision of their communities, namely a “desired future.” The "Circular and Ecological Economy" concept set forth in the Fifth Basic Environment Plan represents an ideal state of Japan to achieve a sustainable society and possible approaches to achieving the society. Under this concept, people in communities will take the initiative and ownership to create businesses that solve environmental, economic, and social challenges and manage the communities including land use, and they will put into practice an area-based approach to achieving II2ES in addition to the inter-disciplinary integration of environmental policies.

2. The role that environmental policies should play in the future: Realization of "new avenues for growth" that will bring about "well-being/quality of life" in the future

Building a "sustainable society, i.e., the circulation and symbiosis based society referred to in the Plan" (hereinafter referred to as a "sustainable society"), essentially requires a healthy and productive environment as its basis and, based on this and on the premise of the existence of socio-economic activities, it needs the avoidance of an increase in environmental loads derived from the efforts mainly for economic growth and improvement of the quality of social infrastructure, or, rather, needs the development of a society into a form that allows the further improvement of the environment.

To this end, Japan should work on efforts for creating new systems that support the establishment of a sustainable society, including the following: providing incentives that reward those who take the initiative and make efforts; creating demand (markets) and new forms of employment for environmental conservation; just transition through re-skilling; internalizing external factors by placing the burden on polluters, taking into account the polluter-pays principle; incorporating environmental considerations from the planning stage; improving and disclosing environmental information, including scientific findings; awareness raising of environmental problems through practical and exploratory environmental education as well as through the Education for Sustainable Development (ESD) by various stakeholders and means, which encourages people to act in all aspects of life, including the home, school, workplace, and community; developing human resources and creating a system therefor to advance efforts for environmental conservation in communities while sharing the future vision with stakeholders; and providing measures to promote partnerships through the participation of diverse stakeholders.

The Fifth Basic Environment Plan presents the role that environmental policies should play in the future, stating that "Future environmental policies should create innovations across all perspectives including those concerning economic and social systems, lifestyles, and technologies, and facilitate simultaneous solutions for socio-economic challenges. These could open up 'new avenues for growth' that ensure quality of life is maintained into the future" (hereinafter referred to as "new avenues for growth").

The First Basic Environment Plan raises the issue that climate change and other environmental problems are largely caused by socio-economic structural problems. Some structural problems causing such environmental problems actually contribute to factors

of the socio-economic challenges faced by Japan.[104] In light of the complementary nature of some systems, it is possible to solve a variety of socio-economic problems at the same time if they are coupled by taking environmental policies as a starting point. However, given the fact that this structural problem has persisted for many years, as seen in "prolonged economic stagnation," we need to reorganize perspectives for solutions or take a stance of what-is-called "change the way of CHANGE."

To achieve "new avenues for growth," "well-being/quality of life" should be set as a common, high-level objective for II2ES, taking into account the purpose of Article 1 of the Basic Act on the Environment. The "well-being/quality of life" is made up by market value and non-market value[105] and both will be increased also by promoting synergetic effects.[106]

If we set "well-being/quality of life" as an objective, the following perspectives are considered as approaches to achieving the objective.

[i] For achieving the "well-being/quality of life," it is essential to enhance not only flow, as represented by GDP, but also stock. In this process, it is important to envision the future ideal state, including the stock, and approaches to realizing it.

[ii] As an approach to solving structural problems in the current age of "100-year life," as some point out, it is essential for us to take actions focusing on a long-term perspective, such as aggressive investment for the future, as many "100-year companies"[107] in Japan have done, instead of being near-sighted, putting off problems, or pursuing only short-term profits. A comprehensive and altruistic perspective, including consideration for ourselves and future generations (to secure intergenerational equity), is necessary to ensure the sustainability of society.

[iii] Coping with the inherent needs of citizens now and in the future based on approaches to an ideal or desired future is necessary, without being overly concerned with the current seeds and strengths of suppliers, as seen in so-called "path dependency" and "innovator's

[104] For example, these problems include prolonged economic stagnation and uncontrolled urban sprawl.
[105] This includes subjective happiness, such as self-affirmation.
[106] This includes the internalization of non-market value, which is external, into market value.
[107] According to a survey, Japan accounts for more than half of the companies that have been running business for 100 years or longer in the world. (Nikkei BP Consulting, Inc., Anniversary Business Lab, "100-Year Companies in the World 2022" (2022)).

dilemma."[108] This includes an action that meets the best available science. In addition, as another important perspective, the combination and rolling out of technologies that have already been demonstrated and implemented may create innovations that meet the inherent needs of citizens now and in the future. Disruptive innovations based on these inherent needs are also necessary to solve structural problems in the economy and society.

[iv] More and more people tend to consider spiritual happiness/wealth more important than material wealth. Economic activities as well should focus on improving quality rather than material quantity and on creating high added value through the utilization of intangible assets, including environmental value. Among these intangible assets, the development of environmental human resources is also indispensable.

[v] As some experts point out as an important matter, social capital is necessary to improve well-being, and this requires enriched communities[109] as a basis. Striking a balance between governments, markets, and communities is also needed to achieve an inclusive society with the participation of many citizens, including vulnerable people.

[vi] As an important viewpoint seen from the perspective of "well-being/quality of life," a shift should be done from a socio-economic system based on the centralization and large-scale concentration in Tokyo to a socio-economic system with a self-reliant, decentralized, and horizontally-distributed national land structure, taking into account the trend toward digitalization. From the perspective of self-reliance, promoting local production for local consumption of food, energy, etc. and ensuring economic security are important.

The foundation for "new avenues for growth" is to first maintain, restore, and enhance natural capital as stock, according to the perspectives mentioned above. If natural capital falls below a critical level (a state in which the socio-economic activities of people have exceeded the global or regional biocapacity, as in the case of pollution), humankind may face a risk of losing the foundation of human existence and livelihood in the first place. We should derive the "well-being/quality of life" from the following approaches: preventing further damage to natural capital by reducing the total environmental loads; avoiding crises caused by climate change, biodiversity loss, and pollution; and enhancing

[108] Clayton M. Christensen, "The Innovator's Dilemma," (1997).
[109] There are two types of communities: a community working as a local community, a group of residents sharing a common living area, and a community working as a group sharing common norms and values.

natural capital to create a good environment; and using the environment in a sustainable manner.[110]

For maintaining, restoring, and enhancing natural capital, it is indispensable for us to expand and improve a stock, namely capital (e.g., human capital and artificial capital) and systems that contribute to this purpose, toward the ideal or desired state from a long-term perspective. The capital[111] consists of both tangible assets (e.g., facilities and infrastructure) and intangible ones (e.g., human capital and brand value). Meanwhile, the systems[112] will correct market failures while maximizing the use of both market value and non-market value (e.g., communities). The improvement of these capitals and systems will contribute to "well-being/quality of life" directly or through the improvement of natural capital.[113]

To achieve this, the people should envision "natural capital and capital and systems that maintain, restore, and enhance natural capital"[114] in an ideal and desired state and coordinate various efforts. In other words, "well-being/quality of life," which includes the subjectivity of the people, and "natural capital and capital and systems that maintain, restore and enhance natural capital" are in a relationship of coevolution, influencing each other and working together to achieve higher levels.

In addition, in the process of this coevolution, enhancing the "natural capital, and capital and systems that maintain, restore and enhance natural capital" as stock toward the ideal and desired level requires a large amount of Japan's public-private investment from a

[110] This approach is considered to be effective in improving mental and physical health, enhancing academic achievement, preventing disasters, gaining comfortability, and accessing superior landscaping.
[111] This includes: infrastructure for suppling decarbonization energy, such as renewable energy facilities that have symbiosis with local communities and contribute to the reduction of total environmental loads (including effective use of existing facilities); tangible assets, such as ZEH/ZEB, EV/charging facilities, recycling-related facilities, compact urban structures, public transportation (e.g., railways); and intangible assets, such as environmental human resources, environmental values, and communities.
[112] This includes: price mechanisms, circulation economic systems, financial systems, education and scientific research, culture in symbiosis with nature, international frameworks and cooperation, and systems of self-reliance and horizontal decentralization.
[113] For example, ZEH and ZEB can reduce utility costs and improve health, comfort, and productivity, while a compact urban structure based on public transportation (e.g., railways) can improve health and smooth mobility.
[114] For example, this phrase can be called "advanced" natural capital for the sake of clarity. It has also been pointed out that this is a concept similar to the so-called "social common capital. (Ministry of the Environment, "Report Compiled by the Study Group on 'New Avenues for Growth' to Bring about a High Quality of Life in Future Years as an Effort in Preparation for the Sixth Basic Environment Plan" (April 2023).

long-term perspective to meet the inherent needs of citizens now and in the future.[115] Investment is inevitable to maintain and expand stock, as stock is depleted with use.[116] In addition, we should turn environmental value, which is an intangible asset, into added value, thereby providing an opportunity to create high added value in the economy as a whole. These actions can be expected to make a positive impact on economic activities as an effect of flow, resulting in creating innovation through capital accumulation and increasing market value (income and GDP) and leading to "well-being/quality of life."

Furthermore, a transition perspective is indispensable in this coevolution process. In light of the crisis we are facing, the government should exercise leadership so that all citizens can clearly share the vision about the ideal and desired state of certain goals, including net-zero emissions by 2050. As the path to realize the coevolution is not easy at all, Japan should recognize the need for the participation of all people, diverse ingenuity, and efforts with a mid- to long-term timeframe and the best available scientific knowledge, resulting in innovation and "well-being/quality of life." Moreover, as discussed in Item 3(3) below, the government, markets, and citizens should coevolve.

3. Basic concepts for the development of future environmental policies

(1) Appropriate responses to international and domestic situations in light of the current environmental crisis and on the basis of the principles and philosophies of environmental policies

Japan will take necessary measures to address the ongoing and growing environmental crisis described in Chapter 1 to realize a sustainable society. To this end, it will improve the scientific findings that form the basis of environmental administration in collaboration with other countries and will also ensure the completeness (in terms of speed and scale)[117] of our efforts in order to respond to the "critical 2030" as well, taking into account the lessons learned from Minamata disease and other pollution and the best available scientific knowledge as a basis.

As we face a critical situation in which human activities are exceeding the biocapacity of

[115] It should be noted that investment incurs costs and that how costs should be borne.
[116] From a macroeconomic perspective, it is also important to note that, as discussed in Chapter 1, the lack of investment, in particular, domestically, is believed to be a cause of the prolonged stagnation of the Japanese economy.
[117] The decision at COP28 states the phrase "pace, depth and breadth [of emissions reductions]."

the earth, Japan should realize the "well-being/quality of life" for the citizens now and in the future, and to this end, the perspective of contributing to the "welfare of humankind" as stated in Article 1 of the Basic Act on the Environment is indispensable. It is important for Japan to act based on the viewpoint that the global society should share, namely protecting the earth's biocapacity, such as the goal of achieving net-zero emissions by 2050 for the entire world. In light of the current situation in which Japan is heavily dependent on overseas countries for natural capital, such as water and food, Japan should take the lead in promoting international cooperation based on the best available scientific knowledge.

Since the enactment of the Fifth Basic Environment Plan, an accelerating number of international frameworks have been built to further correct the directions of socio-economic activities, as seen in the adoption of the implementation guidelines for the Paris Agreement at COP26 and that of the "Kunming-Montreal Global Biodiversity Framework." As described in Chapter 1 above, corporate behavior, in particular, international corporate behavior, has been significantly changing in recent years due to the influence of ESG finance and other factors. As global society has been advancing rule-making on the relationship between environmental policies and various rights and on so-called human rights and environmental due diligence, if Japanese companies fail to properly address these rules, this failure may affect the credibility and competitiveness of these companies and these companies may face the risk of being removed from the global value chain, as some point out. In addition, the EU has been strengthening its policy to require products (e.g., batteries) to be imported to the region to meet its environmental quality standards and other regulations. Accordingly, Japanese companies are required to reduce the environmental loads of their products across the entire value chain and strengthen efforts for recycling and circulation. To address this situation, Japan needs to take the equal footing perspective into account for domestic standards.

In particular, global companies are in competition with each other across borders in a variety of markets. Reducing environmental loads and increasing business resilience in the value chain will help companies to enhance corporate competitiveness as a result and also to contribute to reducing cross-border environmental loads beyond Japan, enhancing business resilience, and realizing a sustainable society.[118] In addition, against the

[118] The Communiqué issued at the G7 Ministers' Meeting on Climate, Energy and Environment in Sapporo and the G7 Hiroshima Leaders' Communiqué emphasizes that improving resource efficiency and circularity in value chains will help address the triple global crisis of climate change, biodiversity loss, and pollution. The Circular Economy and Resource Efficiency Principles (CEREP) highlights, for example, [i] the

backdrop that not only many environmentally-advanced countries but also some developing countries have already been taking steps toward a decarbonized society and making efforts for adapting to society, this circumstance is considered to bring about an opportunity to Japan to enhance its presence in the global value chain by leveraging its outstanding environmental technologies and other strengths.[119]

Given the need to present a sustainable society in which these trends are taken into consideration, we should place the principles and philosophies of environmental policies, which a series of the Basic Environment Plans presented, as a basis for accurately ascertaining changes in international and domestic circumstances, look to appropriately reflecting the interests of future generations in decision making, and advance efforts for improving domestic measures and strengthening international collaboration with an eye on discussions about the post SDGs agenda focusing on 2050.

(2) Integration of various policies and demonstration of synergy toward II2ES

As stated in Chapter 1, the First Basic Environment Plan states that "There is a growing need to reconsider our values placing too much emphasis on the pursuit of material wealth, and the prevailing socioeconomic activities and lifestyles marked by mass-production, mass-consumption, and mass-disposal." This problem awareness can be said to share the same basis with II2ES. In light of this fact, some challenges faced by Japan now in the fields of the environment, economy, and society have a certain level of complex nature as these challenges may occur in association with trends in a wide variety of policy areas. In resolving such complex challenges and for sophisticating II2ES, Japan, as an effort to realize a sustainable society, needs to strategically set cross-sectoral and well-focused frameworks that are interrelated with each other so that specific measures can solve multiple different challenges in an integrated manner based on the perspective of "new avenues for growth." In advancing these actions, Japan should examine progress, e.g., by using indicators, and flexibly revise measures as necessary.

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integration of the circular economy and resource efficiency approaches with existing and new business models along entire value chains to reduce primary resource use and environmental footprints, and [ii] the monitoring of the circular economy and resource efficiency of the value chain and its progress to disclose information, including sustainability reports, looking to future dialogues with investors.

[119] For example, if Japan makes use of its resource circulation technologies in which Japan has an advantage and succeeds in reducing the environmental loads in the upstream of the value chain (e.g., in the mining or manufacturing process), Japan is expected to have business opportunities and contribute to improving the competitiveness of companies that utilize circular resources. On the other hand, reducing environmental loads and improving the circulation of materials in the cross-border value chain requires international rule-making, and this always requires international cooperation.

The G7 Hiroshima Leaders' Communiqué states that the G7 countries commit to realizing the transformation of the economic and social system towards net-zero, circular, climate-resilient, pollution-free and nature-positive economies and to halting and reversing biodiversity loss by 2030, in an integrated manner, while ensuring sustainable and inclusive economic growth and development and enhancing the resilience of our economies.

Research finds that many people around the world spend their everyday lives in conditions below the minimum standards (social boundaries) for the essential social needs of people, including access to water, food, health care, housing, energy, and education. In light of this, the research proposes to combine a "living within the doughnut" with the planetary boundaries concept and defines this as a "safe operating space" for humanity. This research indicates that we need to consider certain issues, such as the environment, distribution, and inequality, in an integrated manner.

Bearing in mind the above and setting the following as goals: the formulation of respective environmental policies; the integration of such policies with other policies in non-environmental fields in consideration of institutional complementarity (including the collaboration and integration of these at the academic level as a premise); and the demonstration of synergistic effects or synergies derived from the integration, the advancement of efforts is important to reduce total environmental loads and work on the specifics of II2ES seen from the viewpoint of "new avenues for growth."[120] In doing so, environmental considerations become an important element to be taken from the earliest possible stage of policy making, e.g., formulating a plan, to avoid trade-offs and demonstrate synergies so as to realize a sustainable society.

In addition, Japan will contribute to the achievement of the SDGs, aiming for the

[120] The IPBES-IPCC Co-Sponsored Workshop Report on Biodiversity and Climate Change, released in June 2021, points out that measures focusing on climate mitigation and adaptation can have direct and indirect negative impacts on nature and nature's contributions to people and that measures focusing on protection and restoration of biodiversity have generally important knock-on benefits for climate change mitigation, but those benefits may be sub-optimal compared to measures that account for both biodiversity and climate. In addition, COP26, which was held in the same year, recognized that tropical deforestation and forest degradation were identified as part of the significant causes of climate change, and based on this, 140 member countries, including Japan, decided to participate in the "Glasgow Leaders' Declaration on Forests and Land Use," upholding the goal of strengthening such efforts as the global conservation of forests and promotion of their restoration. Furthermore, the UNEP International Resource Panel called "Making Climate Targets Achievable" points out at its meeting in 2022 that an absolute reduction in the use of natural resources is indispensable to meet climate change, biodiversity and pollution ambitions.

simultaneous solution of socio-economic problems by environmental policies. The SDG goals are related to each other on the common foundation of the environment, and sustainable socio-economic activities are conducted on this foundation. In achieving the goals, trade-offs should be avoided and integrated solutions that bring about synergies are necessary. Moreover, seeking both approaches are considered important in a win-win mindset. Also, the concept of "backcasting," a method in which you start thinking by defining a desirable future and then work backwards to identify what to do now, is considered important to achieve the goals. In line with the ideas of the SDGs, Japan should work on the specifics of II2ES, too, such as implementing sustainable projects, focus on communities, and incorporate the standpoints of the communities so as to contribute to improving various plans and projects in the communities.

(3) Promotion of "participation": Coevolution of the government, markets, and the people, human resource development, and improvement of information infrastructure

The First Basic Environment Plan and the following editions have placed the term "participation" as one of the four long-term goals of the environmental policies. The 2030 Agenda also clearly states in its declaration part the promotion of "multi-stakeholder" partnerships, namely encouraging all stakeholders to participate in a partnership. A partnership is an element that all environmental policies to be implemented should have. All stakeholders who make up society should recognize themselves as a member of the partnership and play a role equally allocated in accordance with their respective standpoints beyond the borders of jobs and organizations so as to improve and enhance the partnership. Based on this, the respective stakeholders should exercise appropriate leadership to voluntarily and proactively reduce environmental loads and create a good environment.

In order to implement environmental policies more effectively than ever before, the government (e.g., national and local ones), markets (e.g., companies), and citizens (including civil society and local communities) must interact, or in other words, co-evolve, in the direction of realizing a sustainable society. For example, citizens with a high level of environmental consciousness may encourage the government to promote environmental measures (including correcting market failures), while consumers, namely the public as normal citizens, may choose green goods and services, and this may stimulate companies to move in the direction of promoting green innovation. In addition,

if the government takes measures for the internalization of environmental values, environmental education, the development of environmental human resources, and investment in economic competencies involving companies' environmental values (e.g., human capital investment regarding environmental human resources and the marketing of goods and services with environmental values), these measures will contribute to raising public awareness of environmental issues.

For this purpose, Japan needs to: take measures and actions that stipulate public awareness raising of environmental issues, encourage citizens to have more mutual communication, further promote public participation in the policy-making process and policy communication for this purpose, and visualize the results of these efforts. Also, it is important for us to take the viewpoint that all stakeholders should participate in creating an environmentally friendly society so as to learn about the environment, instead of one-sided dissemination and awareness raising of the environment. This co-learning has the potential to help individual citizens, civil societies, and communities to cope with the environment, solve environmental problems, and to be empowered. From the perspective of ensuring intergenerational equity, Japan will proactively promote measures for the "well-being/quality of life" of future generations, including facilitating the participation of young generations in this action. In addition, given the need to promote gender-responsive climate actions in Japan and abroad, Japan will further encourage women to participate in climate change policies and other environmental policies.

These actions should be based on disclosed environmental information with rich contents. This basis allows stakeholders to collect necessary environmental information and access the information owned by other stakeholders that meets their needs, such as information on investment and consumption activities, thereby helping these stakeholders to share the awareness of the current situation and issues derived from the information, hold a vision on their "ideal future," and evaluate and share the progress made in the efforts toward the vision. Based on this, these stakeholders should not only take voluntary and proactive activities but also promote the reduction of environmental loads and the creation of a good environment through a multi-stakeholder approach by creating collaborative projects and taking activities to include people who are expected to be left behind.

(4) Building a sustainable community - Creating the "Circular and Ecological Economy"

As building a sustainable society across Japan requires the respective communities to be sustainable, communities need to further implement "Circular and Ecological Economy" to provide "well-being/quality of life" to community residents and realize "new avenues for growth." The "Circular and Ecological Economy" will be achieved by focusing on the basic ideas described in Items (1) to (3) above and the initiatives for "developing a community as an opportunity for citizens to practice and implement II2ES," which is described in Part 2, Chapter 2, 3, as well as by making full use of all other measures shown in priority strategies and, at the same time, creating innovation in a variety of fields, including socio-economic systems, lifestyle, and technology.

The idea "circulation" in the "Circular and Ecological Economy" refers to a situation in which all kinds of materials—including food, products, circulating resources, renewable resources, artificial stock, natural capital, and elemental-level materials (e.g., carbon and nitrogen)—continue to circulate through all stages of socio-economic activities (e.g., production, distribution, consumption, and disposal) and the natural world. In order to properly ensure this "circulation," we should not only promote the efficiency of circulation, including the reduction of the input of materials, energy, and other resources as much as possible by actively investing in natural capital in communicates and in capital and systems that maintain, restore and enhance natural capital, but also advance the introduction of renewable energy in harmony with communities, promote a diverse and multilayered resource circulation, and at the same time, reduce the environmental loads as much as possible so as to facilitate circular regional economies and promote the circulation of "population" by increasing related populations. Through these actions, Japan will aim to vitalize communities.

The idea "symbiosis" in the "Circular and Ecological Economy" refers to a situation in which people are part of the environment, people are part of living organisms, and people, living organisms, and the environment are inseparably interacting with each other. Based on this recognition, we should aim to ensure the following states: symbiosis between people and nature, including the secondary nature and living organisms; symbiosis secured between people from the perspective of suppliers and consumers of regional resources; and symbiosis between communities—consisting of people and diverse elements of nature, including cities and farming, mountain, and fishing villages—which are achieved by enriching communication and promoting mutual support between communities.

The Circular and Ecological Economy aims to, focusing on "initiative of community" as a basis, continue to create business to improve the environment, economy and society in an integral manner through the sustainable use of regional resources, thereby forming a "self-reliant community" that continues to solve community issues. It also aims to build a "self-reliant and decentralized society" that establishes a network of mutual support communities by taking advantage of the uniqueness of each community. In this process, as our everyday lives should be established on renewable resources, such as recycled resources and biomass resources, including natural resources brought about by the linkages between forests, villages, rivers, and the sea, it is a prerequisite to utilize these resources in a sustainable manner and to maintain, restore, and enhance natural capital.

In the process of creating a Circular and Ecological Economy, constructing a business scheme that sustainably utilizes community resources and creates a virtuous structure for circular regional economies is important for increasing ripple effects to communities and making the communities self-reliant.

Improving the environment, economy and society in an integral manner to create a Circular and Ecological Economy requires to focus on the initiative of communities and partnerships within and outside the communities and then build a regional platform for the purpose of business creation. The operation of the regional platform should be carried out with effective sharing of roles among those who operate the platform, those who can become business entities, and their supporters. Since the types of businesses to be created are diverse, ranging from private businesses to public businesses to volunteer activities, the various stakeholders need to be involved according to the type of business and play their respective roles.

In the process of realizing a Circular and Ecological Economy, the following actions are considered important: avoiding people and regions from being left behind during the transition to a sustainable society; forming a mutual support network of people working on a Circular and Ecological Economy; building an intermediary support system for supporting efforts by communities; enhancing the sustainability of each community by building a support network between rural areas, regional cities, and large cities; strengthening partnerships among local governments, small and medium-sized enterprise (SMEs) and other companies that support the local economy, financial institutions, NGOs and NPOs; and improving the attractiveness of communities and solving environmental, economic, and social issues by making use of digital technologies. Through these actions

we need to create leading case examples that bring about greater positive impacts on the environment, economy, and society than ever before and increase the number of communities tackling efforts to create a Circular and Ecological Economy.

The initiatives of the Circular and Ecological Economy can also be described as local SDGs, which focus on initiative of community as a basis for solving environmental, economic, and social issues in an integrated and synergistic manner through partnerships. In conjunction with the development of DX in the post COVID-19 era, we will contribute to building sustainable communities around the world while sharing our efforts with communities around the world that are working on SDGs by taking such opportunities as international conferences.

As a Circular and Ecological Economy is formed in a way in which self-reliant communities are built and they establish a network, it is important to use a bottom-up approach to build it, setting a final goal of achieving a sustainable society in which Japan as a whole works as a single Circular and Ecological Economy. This concept allows the respective communities to be self-reliant and sustainable, which further allows them to pass on their natural features and cultures to future generations in a form that is adapted to the times, helps such communities to maximally make use of renewable resources, such as recycled resources and biomass resources, which are found widely across Japan, including renewable energy, food, recyclable resources (e.g., metals and plastics), and attractive natural resources under appropriate management, and contributes to developing a diverse and attractive country characterized by community resources. It also helps to build a self-reliant community and restore the power of communities, thereby complementing the roles of the government and markets while, at the same time, striking a balance between the government, markets, and communities, and it also contributes to realizing the "well-being/quality of life" of community residents, including those in rural areas, regional cities, and large cities, as well as to "new avenues for growth."

Chapter 3 Principles and methods of environmental policy

1. Principles of environmental policy

(1) Risk assessment and prevention principle, and precautionary approach

Japan should implement an environmental policy based on the best available science as a prerequisite while working on the enhancement of scientific findings.

Many environmental problems are associated with some scientific uncertainty. Examples include the environmental impacts of global warming, and the effects of chemicals on health and ecosystems. In such cases, environmental risk assessment should be carried out based on the scientific knowledge available at the time, evaluating to what extent a particular issue generates impacts on health and the environment, and looking at the probability of such impacts occurring. The next critical step would be to judge the necessity and urgency of countermeasures, taking into account the predetermined acceptable level of risk, and then to set priorities and put countermeasures in place.

A. Prevention principle

Where a causal relationship between human activities and damage to human health or the environment can be scientifically demonstrated, efforts for the conservation of the environment should be undertaken by emphasizing the prevention of hindrances to environmental conservation. With regard to the relationship between greenhouse gas emissions associated with human activities and climate change, the IPCC AR6 Synthesis Report states that "It is unequivocal that human influence has warmed the atmosphere, ocean and land." and the climate change issue has moved to a stage where measures based on this "prevention principle" are necessary.

B. Precautionary approach

Still the fact remains that there will always be some uncertainty left in identifying causes of the problem and in evaluating consequent impacts, and in planning and implementing countermeasures, even if those countermeasures were put in place based on the best scientific knowledge at that time. However, if no measures are taken because of uncertainty, then once the problem does occur, it may well cause massive damage and incur massive costs associated with countermeasures that then become necessary. The consequences could be long-term or even irreversible.

For this reason, scientific uncertainty should not be a reason for delaying measures to tackle problems that may cause environmental problems. Every effort should be made to enhance scientific knowledge, and preventive measures should be taken based on a "precautionary approach." This fundamental approach has already been adopted in various environmental policies, e.g., global warming, biodiversity conservation, chemicals, and air pollution. For example, the Basic Act on Biodiversity stipulates provisions supporting the precautionary approach. Many of the international conventions ratified by Japan also include the precautionary approach. This points to a growing need to implement domestic measures based on the precautionary approach. From now on, it will be vital to continue promoting and developing policies underpinned by this approach.

In light of the lessons learned from Minamata disease as described in Chapter 1 and the fact that global countermeasures have progressed in the field of climate change through efforts based on a precautionary approach in accordance with accumulated scientific knowledge, including a series of IPCC reports, not only the aforementioned prevention principle but also the precautionary approach are still important.

Since the Great East Japan Earthquake, the importance of risk assessment and the precautionary approach has been reaffirmed not only from the disaster prevention point of view, but also from the environmental policy perspective. Indeed, risk assessment should be carried out as objectively as possible based upon scientific knowledge, thereby promoting policies that are in line with the concept of "environmental risk" and the "precautionary approach."

Even after policy decisions have been made, for example, in the area of biodiversity conservation, regular reviews should continue for necessary additions and other changes of policy measures in accordance with the adaptive approach, drawing on newly accumulated scientific knowledge.

Furthermore, in order to make policy decisions in the face of a certain degree of uncertainty, risk communication that leads to the building of trust and common understanding through dialogues is indispensable. In that case, all-out efforts should be made to promote communications among stakeholders, and policymakers should hold full accountability to this end. Furthermore, holding discussions is also necessary from a transition perspective by setting a mid- to long-term timeframe and taking into account

the best available technology (BAT).

(2) Polluter-pays principle

The "polluter-pays principle," a standard for allocating the expenses for environmental conservation measures, is important for incorporating the cost of pollution prevention measures in the market through pricing, thereby promoting the rational use of scarce environmental resources. In addition, it should be noted that the polluter-pays principle in Japan has been discussed as a principle of justice and equality that would contribute to bearing the cost of decontamination and relief measures for victims. Going forward, paying attention to ensuring fairness in international competition in terms of the burdens that polluters should bear will continue to be important, while corporate management and consumption behavior that take safety and environmental considerations into account should be stimulated by reflecting in product and service prices the costs of preventing environmental pollution caused by accidents and operations.

(3) Environmental efficiency

Socio-economic activities within the limits of environmental biocapacity need to improve "environmental efficiency," in other words, dramatically reduce environmental loads per unit of the production of goods and the provision of service, thereby further reducing the total amount of environmental loads (absolute decoupling)— whether or not the affluence and economic value that we make expand—to achieve "well-being/quality of life." Focusing on this decoupling as a basis, environmental value should be considered as a source to add not costs but higher economic value to goods and services.

In addition to the above, it is important to promote policies in accordance with not only the concept of "extended producer responsibility," in which a manufacturer of products is physically and financially responsible for the products up to the post-use stage of the products in the life cycle, but also the "principle of 'taking measures at pollution source,'" in which a manufacturer should use ingenuity in the designing and manufacturing process of products to avoid the discharge of pollutants and waste as much as possible from the beginning.

2. Approaches to implementing environmental policies

Based on the major environmental policy directions elaborated above, and to find solutions to the individual environmental policy challenges listed in Part 2, it is necessary to prioritize policies, improve cost-effectiveness, and reduce the expenses borne by society as a whole. Up until now, various policy approaches, such as direct regulation, subsidies, tax incentives, and public awareness raising, have been implemented. However, there is still a need for developing new policy approaches, improving existing policy approaches, and expanding the scope of policy application. This is indicated in Chapter II, Section 5 of the Basic Act on the Environment. The environmental policy approaches that satisfy specific policy objectives are outlined below.

◦ **Direct regulation approach**

Direct regulation specifies certain goals and compliance matters to be achieved by society as a whole, then utilizes laws and other control measures to achieve these goals and compliance matters. This is effective for the prevention of environmental pollution and land use control for the conservation of the natural environment.

◦ **Regulatory frameworks approach**

This approach intends to require stakeholders to present and then achieve goals or require them to complete predetermined steps or procedures, thereby achieving the regulatory objectives. This approach is effective for taking preventive or advanced measures to deal with new environmental pollution for which quantitative target setting and specific compliance matters are difficult to set, while making full use of the creativity and ingenuity of those subject to regulation.

◦ **Economic approach**

This approach aims to achieve policy objectives by providing economic incentives to stakeholders on the basis that a market mechanism exists so that the stakeholders can take economically rational actions in the market. Specific measures include subsidies, financial support by tax incentives, imposing an economic burden via taxation, emissions trading, and feed-in-tariffs (FIT), among others. This approach is effective for encouraging a large number of stakeholders, to whom the authority finds it difficult to execute any direct regulatory instruments or regulatory frameworks, to reduce environmental loads through changes in market prices and other means.

◦ **Voluntary approach**

This approach seeks to achieve policy objectives by way of encouraging businesses to set

voluntary targets for their own actions. It is particularly effective in cases where businesses have widely expressed their commitments to society and their progress is checked by the government, i.e., almost equal to a social commitment. This creates an incentive for technological innovation, and contributes to raising environmental awareness and bringing in environmental education/learning for the stakeholders concerned. This approach is expected to be effective in cases where businesses need to deal with complicated environmental problems quickly and flexibly by making full use of their expert knowledge and ingenuity.

◦ **Information approach**

This approach promotes the disclosure and provision of information on the environmental load of business activities, products and services so that businesses actively engaged in sound environmental practices and producing environmentally friendly goods can be selected for investment and procurement. Publishing environmental reports and demonstrating environmental performance are notable examples, which are expected to be effective in promoting environmental considerations of all stakeholders, including suppliers of products and services.

◦ **Procedural approach**

This approach intends to incorporate procedures and criteria for environmental considerations into the decision-making processes of a stakeholder. Examples include the environmental impact assessment (EIA) and the Pollutant Release and Transfer Register (PRTR) system that require business operators to report the amounts of designated chemicals released and/or transferred. This approach is considered effective in integrating environmental considerations into the actions of each stakeholder.

◦ **Action approach**

This approach aims to allow the national and local governments to directly advance projects and thereby to achieve policy objectives. This approach helps such public entities to directly conduct projects so as to achieve the objectives, unlike other approaches that exert effects on other stakeholders.

In addition to those listed above, the Basic Act on the Environment also includes many other measures, including those for promoting public understanding through environmental education and learning. Moreover, mainly as one of the informational methods and voluntary initiative methods, a new policy method has been developed and

implemented in which the findings of the nudge theory[121] and other behavioral sciences are utilized. In the past, one conventional policy method among others might be effective as seen in the case where one policy was able to work to solve some environmental pollution problems caused by specific large-scale sources of environmental loads. However, concerning the challenge in the environmental policies that we face today, i.e., integrating various policies to create synergy and promoting initiatives for II2ES to realize a circulation and symbiosis based society, we may face difficulty to solve this challenge just by using the same way as in the past. Against this backdrop, in addition to developing new approaches to implementing policies, it is indispensable for Japan to take the following actions: taking into account the nature and characteristics of policy objectives so as to choose appropriate policy methods from among these various methods, appropriately combining policies from a policy mix perspective to prepare a policy package, and thereby achieving a synergistic effect.

We should consider an appropriate combination of various policy approaches elaborated above when considering and implementing individual measures according to the Plan.

[121] The term "nudge" (meaning to push something/someone gently) in public policies refers to a policy method that stimulates people to voluntarily make a better choice through the use of scientific knowledge on behavior, as defined by the Diet defined. This method is characterized by providing people with room to freely make a choice and by being cost-effective, and these characteristics stimulate overseas countries to make use of the method in various public policy areas. Looking at Japan, the Nudge Unit of Japan was established in April 2017 in the government-industry-academia collaboration, designating the Ministry of the Environment as its secretariat. The unit has been advancing study on the use of the nudge theory and other behavioral science findings to solve social issues arising from behavior.

Part 2 Putting the environmental policy into action

Based on the sense of crisis described in Chapter 1 of Part 1 in this Sixth Basic Environment Plan (the "Plan") and toward the realization of a sustainable society, i.e., a circulation and symbiosis based society as stated in the Plan, the environmental policies will cover the measures to be implemented over the next five years or so, which should not only be in line with the basic concepts described in Chapters 2 and 3 of Part 1 but also look to 2050 and beyond and bear in mind the important milestone of 2030. Moreover, based on the results of the examination of the Fifth Basic Environment Plan and from the viewpoint of integrally implementing such environmental policies in individual fields, we hereby call the cross-sectoral strategies shown in Chapter 2 below "priority strategies" and the strategies in individual fields in Chapter 3 below "priority measures," and then we will collectively call these measures "priority fields," which are subject to promotion.

Chapter 1 Development of environmental policies by priority field

1. Establishment of priority strategies to be implemented across individual fields and development of priority measures in the fields

As an effort to realize a circulation and symbiosis based society, namely the ideal sustainable society, we should implement environmental policies in individual fields together, including net-zero emissions, the circular economy, and the nature-positive, toward the Integrated improvements on Environment, Economy and Society (II2ES). This will demonstrate synergy and lead to solutions to structural socio-economic problems. To this end, it is necessary to set cross-sectoral strategies while taking into account the administrative plans that have been formulated in individual fields, and thereby specific policies will together solve several different issues.

In implementing these cross-sectoral strategies, we will aim to realize a circulation and symbiosis based society and a Circular and Ecological Economy. At the same time, upholding these goals, we will aim to implement the strategies from the perspective of "new avenues for growth," with the understanding of respective citizens, and with the participation of all stakeholders.

These strategies should be set based on the following six perspectives.
(1) Concerning economic activities, Japan will aim to build a green economic system that

achieves sustainable production and consumption and will lead to "new avenues for growth," including appropriate assessment of environmental values and encouragement of investment in natural capital and capital that maintains, restores, and enhances natural capital based on a long-term perspective. [Establishment of a green economic system that realizes sustainable production and consumption as an effort leading to "new avenues for growth"]

(2) Japan will aim to make sustainable the national land, i.e., the foundation of socio-economic activities. It should enhance the value of the national land as stock by expanding natural capital and capital that maintains, restores, and enhances the natural capital. [Enhancement of the value of national land as stock placing natural capital as a basis]

(3) Japan will aim to develop sustainable communities as its basis that utilize local resources and link the outcomes to solutions to community socio-economic problems, thereby carrying out and socially implementing II2ES. [Development of communities as a place to implement II2ES]

(4) Aiming to help people to realize well-being/quality of life in their everyday lives, Japan will address climate change, biodiversity loss, environmental crisis caused by pollution, and other issues, and create lifestyle innovations so that people can realize safe, secure, healthy, and fulfilling everyday lives. [Realization of safe, secure, healthy, and fulfilling everyday lives that allows people to realize "well-being/quality of life"]

(5) Focusing on the research, development, demonstration, and dissemination of environment-related science and technology that support the economy, land, communities, lifestyles, and international relations, Japan will advance innovation in a wide variety of fields while taking into account the essential needs of citizens now and in the future. [Development, demonstration, and social implementation of science, technology, and innovation to support "new avenues for growth"]

(6) In a situation where the environment has been becoming a mainstream issue in certain areas, e.g., security and business, Japan will realize a sustainable society achieved within the limits of the earth's biocapacity. To this end, it will promote international cooperation centered on the environment and contribute to national interests and the welfare of humankind. [Contribution to national interests and the welfare of humankind by promoting strategic international cooperation centered on the environment]

There is some overlap between the six priority strategies. Rather than strictly separating each strategy, this overlap will enable one policy measure to address more than one priority issue, thereby creating the synergy needed to accelerate the realization of a sustainable society.

Although some of the measures upheld in the priority strategies are related to priority strategies

in other fields, these measures have been fallen under a priority strategy that is considered most relevant for the sake of convenience. Therefore, when implementing and rolling out the respective measures, we should adopt a sufficiently broad perspective to take into full consideration the relationship between the measures and other priority strategies.

Based on the above viewpoints, Chapter 2 will explain the respective strategies in a specific manner.

In addition, Chapter 3 will work out the specifics of priority measures in individual fields.

Japan's environmental policy originated from countermeasures taken against the serious pollution that occurred during the period of high economic growth after World War II. The policy undoubtedly brought tangible environmental benefits responsible for much of today's dramatically improved living conditions. Our current standard of living tends to be thought of as "a given," but it must be remembered that it is in fact due to "a culmination of historical efforts" to improve environmental health.

Environmental policies that started to deal with pollution control now cover a wide range of issues, including climate change, waste management, and biodiversity loss, and government plans in each of these areas have been formulated to deal with these issues. Countermeasures are making progress, but they fall short in many ways. The government will continue to promote measures in each field and strengthen measures to ensure that responses are adequate.

2. Improvement and strengthening of partnerships

The transformation to a sustainable society requires the participation of all stakeholders. These stakeholders should appropriately share their roles, cooperate with each other on an equal footing, confirm and verbalize the future vision and common interests of communities, and converge the power of individual stakeholders to the effort for achieving ideal approaches to communities. The transformation also requires, as discussed in Part 1, that the government (e.g., national and local governments), markets (e.g., companies), and citizens (including civil society and local communities) should aim to interact, i.e., coevolve to realize a sustainable society under the "multi-stakeholder" partnership. In such partnership (collaborative effort), if stakeholders gain a multifaceted perspective through the collaborative process of building a relationship of trust based on dialogues with others and achieving a shared understanding, they may change their way of thinking, resulting in the strengthening of communities' ability to solve

issues. Accordingly, we can say that collaborative efforts are a means to solve issues and a source of growth for communities. For this reason, we should ascertain a series of processes involving collaborative efforts from a governance perspective (collaborative governance[124]), provide stakeholders with human and material resources and information related to the efforts, develop an opportunity for holding a dialogue while organizing standpoints that stakeholders face, and stimulate the interests and motivation of stakeholders for encouraging the stakeholders to find solutions and advance toward the goal. By doing so, we should establish a mechanism of collaboration placing the intermediary supporting function[125] at the core.

(1) Role of each stakeholder as a prerequisite for partnership

In putting these environmental policies in place, every stakeholder that makes up society should be aware of its own responsibility to the environment. We must realize that addressing environmental measures can bring great benefits for our lives, as well as for regional and corporate management. We must also recognize that a major risk will emerge if we neglect or postpone environmental measures. Based on this awareness, we should understand our roles to be played in environmental conservation and the significance of participating in such conservation, and enhance and strengthen partnerships across the borders of industries and organizations by equally allocating roles by the position of each stakeholder. Exercising appropriate leadership is also another goal to be achieved by each stakeholder so as to voluntarily and proactively reduce environmental loads and create a good environment.

The following points will clarify the roles that the government should play in order to enhance and strengthen partnerships as well as the roles that local governments, businesses, non-government organizations, and citizens are expected to perform.

◦ **National government**

As an effort to encourage stakeholders to participate in society-wide efforts for environmental conservation so as to advance such efforts in an integrated manner, the national government

[124] Collaborative governance is an approach taken in the process of collaborative efforts in which emphasis is placed not only on the general management of progress made in a project (project management) but also on a "system and its operation (i.e., governance)" for propelling related efforts in collaboration with stakeholders, including how stakeholders are involved in the process, how relationships are created, how to respond to changes in the surrounding environment, and how common rules are developed.

[125] This is an effective function to promote collaborative efforts, including the following: linking certain resources, e.g., people, goods, money, and information; supporting a process that bolsters progress management by confirming the level of acceptance by stakeholders and forward-looking steps to be taken by them; promoting a change by stimulating people's interests and motivation toward such change; and presenting a solution to a certain problem that helps people to discover an essential solution.

should play the role of building a framework that encourages the participation of all stakeholders while promoting cross-sectoral cooperation within the national government and promoting the creation of a sustainable society through dialogue-based collaborative efforts taken among local governments, businesses, private organizations, and citizens. For this purpose, it is important for the relevant ministries and agencies to cooperate with each other across a variety of fields and to show to all stakeholders goals, future directions, and allocated roles involving environmental conservation efforts, with the participation of local governments as important partners in promoting environmental administration. Moreover, the national government needs to put forward a shift of the overall socio-economic system and introduce environmental considerations in national land use in assurance with the provisions of Article 19 of the Basic Act on the Environment, thereby building a basis that meets the regional features on which stakeholders can take actions.

Scientific findings are indispensable for the promotion of environmental policies. In this context, the national government should newly generate and accumulate scientific findings and improve basic information to promote the sharing of the latest scientific findings. It also should provide to citizens professional information and appropriate evaluation results of environmental values in an easy-to-understand manner so that citizens can put environmental considerations to practice, such as proactively selecting highly green products and services.

In addition, in order to promote the voluntary and proactive actions of stakeholders and the participation of stakeholders in environmental policies, the national government should promote environmental education and ESD, develop environmental human resources, support private-sector activities, and provide information, as well as promote dialogue among various stakeholders and promote networking and partnerships between efforts. In particular, from the viewpoint of intergenerational equity, it should take measures to help young people—who are important players in creating a sustainable society—to have opportunities to have their opinions accepted in efforts, independently convey their interest in environmental issues and creative ideas that contribute to problem-solving, and participate in the creation of society.

Furthermore, it will proactively and broadly incorporate environmental considerations into its own initiatives.

◦ **Local governments**

Local governments are key to promoting priority strategies in communities and playing a major role as promoters of community environmental conservation as the basis for building a

sustainable society. It is the local governments that are expected to act as the coordinator for community actions. They also have an important role in enhancing and strengthening communities. For this purpose, local governments should strive to make cross-sectoral collaboration between related departments. At the same time, they should provide opportunities for regional companies, associations, and residents to discuss and consider the goals and directions of community initiatives tailored to the features of communities, establish platforms for allowing people to show goals and future directions, setting a variety of systems, and developing social capital, and promote dialogue-based collaborative efforts between residents, businesses, private associations, other local governments, and related governmental organizations, e.g., efforts to encourage stakeholders to take environmental actions. These activities are expected to integrally serve the development of environmental conservation measures in communities.

Furthermore, local governments are expected to broadly and proactively incorporate environmental considerations into their own activities and, as central players in the creation of a Circular and Ecological Economy, to work on building regional platforms that is the base of "self-reliant communities."

◦ **Businesses**

As businesses account for a major part of economic activities and are the entities most familiar to consumers, their efforts are extremely important in reducing environmental loads. In all aspects of their business activities, businesses need to voluntarily and proactively promote not only pollution prevention but also efficient use of resources and energy and waste reduction, as well as advance efforts to reduce their environmental loads throughout the entire value chain, ranging from procurement to production to distribution to consumption of materials. In this process, it is particularly important for them to address climate change in a manner consistent with the 1.5°C goal. In addition to conventional efforts for environmental conservation, more and more businesses have been engaging in the movement to realize the nature-positive through their activities, which is expected to have an impact on people to change their awareness and behaviors about environmental issues, including economic competencies, e.g., environmental human resource development.

Furthermore, businesses should regard various challenges, including environmental ones, as opportunities rather than risks. This approach may help businesses to inspire—not by excessively falling into so-called path dependency but by taking into account the best available science—the development of new technologies (including combinations of existing

technologies) and green products and services that meet the essential needs of citizens now and in the future and to create new business opportunities. These types of business and a type of business that sustainably utilizes natural capital are expected to be proactively disseminated as they will contribute to environmental conservation and the maintenance, restoration, and enhancement of natural capital and will play an important role in the formation of a sustainable society.

Meanwhile, we expect financial institutions and investors to promote initiatives for sustainable finance, a type of finance that facilitates investments that lead to a reduction in negative environmental impacts from businesses, encourages businesses to take on challenges, and thereby creates a flow of funds that contribute to building a sustainable society.[126] Businesses should have a sustainability perspective when formulating their business strategies—including not only large companies, which are required to disclose information on risks and opportunities in response to the financial side through the frameworks of TCFD and TNFD, but also SMEs, which are important players in communities. Concerning SMEs' efforts that require support, financial institutions are expected to provide SMEs with mentoring support to contribute to SMEs' business strategy development, management stability, and business expansion, and they are anticipated to raise SMEs' awareness of sustainability management.[127]

◦ **Non-government organizations**

Non-government organizations engaging in environmental conservation activities are bodies organized by citizens and businesses, e.g., NPOs, NGOs, educational institutions, research institutions, the scientific community, cooperatives, and labor unions. They form a platform for environmental conservation efforts by actively engaging in a wide range of autonomous and organized activities and they play a major role in environmental conservation, e.g., by providing important input into efforts taken by the national government, local governments, and businesses. Working as a nodal point, non-government organizations are considered to play an important role in advancing efforts for building a society in which all stakeholders proactively participate in environmental conservation activities. In particular, they are expected to engage in meticulous activities, e.g., grassroots activities and private-sector international cooperation.

Other roles that non-government organizations are expected to play include the following:

[126] For example, see the Financial Services Agency, "Expert Panel on Sustainable Finance: Third Report" (June 2023).

[127] For more information on decarbonization advisors, see the section titled "Expansion of human capital investment and investment in organization capital through the development of environmental human resources, etc." of Item 1 "Establishment of a green economic system that realizes sustainable production and consumption as an effort leading to 'new avenues for growth'" in the next chapter.

deploying specific, voluntary environmental conservation activities; evaluating efforts taken by administrative agencies, businesses, individuals, and other stakeholders and connecting these stakeholders to further accelerate efforts; promoting the sharing of expert information owned by the respective stakeholders with citizens in an easy-to-understand manner; making proposals based on their own specialized abilities; and working together with the national government, local governments, businesses, and other entities to address issues.

Educational institutions, research institutes, and the scientific community, in particular, are expected to advance efforts based on the most recent scientific findings, such as efforts for further enhancing scientific findings, sharing data, providing information on knowledge, and promoting the development of innovative technology.

◦ **Citizens**

Environmental impacts resulting from our everyday lives have been on the increase, and this makes it necessary for citizens to shift to more sustainable lifestyles.

To this end, citizens should strive to take the following actions: recognizing the importance of always "living within the doughnut" (i.e., living above the social boundary, but within the planetary boundary) with respect to the lives and actions of themselves and others, as described in Part 1; deepening their understanding of the relationship between humans and the environment; incorporating environmental considerations into their activities; and reducing environmental loads from their everyday lives. Particularly, as consumers, citizens are expected to shift their value from that focusing on quantity and prices to that focusing on quality and high added value. As the greening of awareness and actions of consumers on the demand side will stimulate the greening actions of businesses on the supplier side, this shift will become an important change working as a starting point of coevolution.

Citizens are also expected to advance voluntary and proactive actions to improve their nearby environment to the better one.

Furthermore, building a sustainable society requires the reflection of citizens' views in the policy decision-making processes. Accordingly, citizens are expected to actively participate in various opportunities provided by the national and local governments.

As mentioned in Part 1, all stakeholders should participate in efforts to build an environmentally conscious society in which we can learn together, thereby enhancing the responsiveness and

problem-solving capacity of civil societies and communities. In this "learning together" process, the inclusiveness of diverse participants should be secured, e.g., by promoting the participation of younger generations from the perspective of ensuring intergenerational equity and encouraging the participation of women from the perspective of gender equality.

(2) Directions for enhancing and strengthening partnerships

A partnership of diverse stakeholders is upheld as one of the "Five Ps"[128] that form basic elements underlying the SDGs. This type of partnership will become more and more important in ensuring the steady implementation of the Basic Environment Plan. When we implement the priority strategies and the measures that support the dissemination of the strategies, partnership among the stakeholders involved in such measures will work as a common element underlying all measures and become a dynamo to drive efforts to build a sustainable society. As environmental information is pivotal to attract more proactive participation by stakeholders, stakeholders should carry out the following indispensable actions: providing environmental information that meets their demand; sharing their awareness of the current situation and issues based on the information; confirming and verbalizing the future vision and common interests of communities by placing the environment at the core to achieve the Integrated improvements on Environment, Economy and Society (II2ES); and enhancing and strengthening partnerships in the step of implementing measures so as to realize the desired state of communities and "well-being/quality of life" of community residents. To this end, intermediary supporting functions will work significantly.

Moreover, stakeholders will be able to gain multiple perspectives through the collaborative process, e.g., dialogue-based building of trust and common understanding, resulting in changing stakeholders themselves and strengthening the problem-solving capacity of communities. In this context, making collaborative efforts may become a means to problem-solving as well as a source of community growth.

For this reason, a collaborative framework placing intermediary supporting functions as the core should be built, in which we should advance a series of collaborative processes from the viewpoint of governance (collaborative governance), provide human and material resources and information related to initiatives to stakeholders, organize information on the situation of stakeholders as well as create opportunities for dialogues among them, and encourage stakeholders to find solutions and cultivate ways to reach goals while stimulating the interest

[128] People, Planet, Prosperity, Peace, and Partnership

and motivation of stakeholders.

In light of this, it is desirable for Japan to bear in mind the importance of partnerships in advancing deliberations on the appropriate and effective implementation of specific policies regarded as priority strategies. For example, the following initiatives require enhanced and strengthened partnerships.

- Promotion of community building in which a community facing a declining birthrate and an aging population utilizes its natural capital to the maximum extent possible (Circular and Ecological Economy).
- Further promotion of environmental education based on the concept of ESD and reconstruction of communities as an opportunity for putting environmental policies into practice, both of which take advantage of all-inclusive partnerships among administrative agencies, schools, companies, residents, community associations, NPOs, NGOs, the scientific community, cooperatives, and other entities.
- Encouragement of citizens to take proactive and voluntary actions encouraged by the following actions: stimulating companies' voluntary efforts that contribute to building a sustainable society; and promoting a movement that raises public awareness of linking choices of green products and services to solutions to environmental issues so as to achieve better and more affluent lifestyles.
- Promotion of economic competencies, e.g., development of environmental human resources and marketing involving environmental value, and shifting of consumer behavior from that focusing on prices to that focusing on quality, e.g., environmental value.
- Promotion of technological development and dissemination to conserve the rich environment for the future through partnerships among stakeholders in the government, industry and academic sectors, e.g., open innovation.
- Promotion of risk communications based on dialogues and joint-thinking toward the goal in which a variety of stakeholders, including the national government, local governments, businesses, non-government organizations, and citizens, will further deepen mutual trust and work together to reduce environmental risks, thereby realizing a sustainable society.
- Promotion of international collaboration at a variety of levels, e.g., between the government of Japan and other national governments or international organizations, and among municipalities engaging in international affairs, businesses, and non-government organizations.

These actions will make it possible for stakeholders to cultivate multifaceted viewpoints and will help human resources to acquire skills to realize II2ES. In other words, enhancing and

strengthening partnerships will contribute to human resource development and will become a driving force for people to close to a sustainable society. Specific measures to improve and enhance partnerships include not only the existing system of discovering and awarding good practices that contribute to II2ES but also the fostering of human resources who play a leading role in advancing intermediary supporting functions that work to support partnership-based initiatives and their support organizations. These measures are considered important in helping stakeholders to promote partnership-based initiatives and creating a system in which these stakeholders can collaborate and sustain collaboration in communities.

Chapter 2 Development of environmental policy for each priority strategy

1. Establishment of a green economic system that realizes sustainable production and consumption as an effort leading to "new avenues for growth"

(Basic concept)

Toward building a circulation and symbiosis based society and as an effort to develop the Japanese economy while bringing the economy closer to the ultimate socio-economic material flow (including elemental level) in harmony with nature, Japan should break away from the conventional economic system,[129] which was designed on the premise that "quantitative expansion," "centralization," and "standardization" would produce a successful model enabling efficient economic activities. This is a global challenge, i.e., a shift away from a civilization that has made extensive use of fossil fuels and other underground resources since the Industrial Revolution. A pathway to the realization of a new economic system requires the sufficiency of our efforts (in terms of speed and scale) based on the best available science, and these efforts to achieve the goal have the aspect of international competition.

Dramatic improvements in environmental efficiency, e.g., resource productivity and carbon productivity, will reduce the total amount of environmental loads, protect biocapacity, maintain, restore, and enhance natural capital, and enable effective use of the capital. This will contribute to creating socio-economic innovation that will accelerate the absolute decoupling of environmental loads reduction from economic growth.

Specifically, this approach consists of the following: aiming at achieving "well-being/quality of life," dramatically expanding investment in natural capital and tangible and intangible capital that maintains, restores, and enhances natural capital from a long-term perspective, and increasing capital stock that serves as a source of innovation. This approach also includes, in particular, solving the "fallacy of composition"[130] by increasing domestic investment together with sustainably making use of capital stock, e.g., natural capital, thereby leading to the driving of economic growth. At the same time, Japan will promote measures under the Strategy for Promoting the Transition to a Decarbonized Growth-Oriented Economic Structure to realize green transformation (GX).[131]

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[129] The expression "standard mass-production type industrial society" appears in the "Economic White Paper 2000" released by the Cabinet Office.

[130] See the paragraph starting from Line 8 on Page 18 of the Plan.

[131] This paragraph describes measures primarily regarding the denominator in resource productivity and carbon productivity.

In addition, Japan will encourage markets to appropriately assess value that leads to "well-being/quality of life," e.g., environmental value, and strive to improve such value across value chains, thereby bringing about the high added value of goods and services (e.g., improving the mark-up ratio and unit price of goods and services). With regard to consumption behavior, Japan will encourage consumers to shift their value from that focusing on price to that focusing on quality, including environmental value as well as raise public awareness of environmental issues. From the perspective of converting existing or already-improved environmental value and performance[132] into added value as well as accurately ascertaining the essential needs of citizens now and in the future, Japan will promote investment in intangible assets, including digital-related assets, in particular, expand investment in economic competencies, and also improve environmental information. Moreover, it will further transform the economy from a one-way, linear economy that leads to a disposable-based mass production, mass consumption and mass disposal socio-economic society, to a circular economy in which products are used for a long time through repair and maintenance and reused and recycled, and in which resources are effectively used in an efficient and circulated manner throughout the market life cycle toward a goal of maximizing the value of resources and products, minimizing resource input and consumption, and curbing the generation of waste. Following this, it will make this transformation sustainable and push it to become mainstream in socio-economic activities. Through this approach, Japan will coevolve consumption behavior and corporate behavior (production behavior) placing environmental value[133] at the core.

In addition, as decarbonization and other environment-related markets are expected to expand overseas, Japan will promote the supply of green products and services with high environmental value and international competitiveness and will strive to significantly reduce the environmental loads of the entire value chain by enhancing circulation and efficient use of energy, thereby creating a further competitive advantage and building a driving force for the Japanese economy. Moreover, building an economic system based on the circulation of renewable resources is anticipated to bring about the following effects in Japan, i.e., reducing the imports of fossil fuels

[132] The value and performance are categorized into two: those that goods and services have and those achieved by changes in the manufacturing process. The former corresponds to product innovation and the latter to process innovation. In the process of achieving environmental value and performance through changes in the manufacturing process, productivity can be improved along with the updating of production facilities, but some cases require investment that increases costs even with other the value of goods and services remaining unchanged. In such cases, as described below, the expansion of the goods and services indispensably requires certain efforts to be tackled throughout the entire value chain, e.g., appropriate evaluation of environmental value and performance and improvement of the unit price of goods and services.

[133] This paragraph describes measures primarily regarding the numerator in resource productivity and carbon productivity.

and mineral resources from overseas, which may result in improving the international balance of payments; and securing its contributions to energy security and economic security, including a stable supply of resources, as well as food security.

Through these efforts, Japan, while attracting domestic and overseas demand, will shift the entire economy from a quantity-based economy to a quality-based economy, from the existing one to one with high added value, and from a linear one to circular one, so as to achieve sustainable production and consumption as well as contribute to enhancing labor productivity and wages at the same time. To this end, Japan essentially needs to promote the greening of the economic system, including the correction of market failures, e.g., the internalization of external diseconomies, and at the same time, it should effectively make use of market mechanisms to encourage citizens to exercise their creativity and ingenuity and change their behavior, which will contribute to environmental preservation. Meanwhile, amid the mainstreaming of the movement in which institutional and other investors are likely to consider environmental considerations, e.g., ESG investment, as an important element in making investment decisions, Japan will work to expand environmental finance that shifts the flow of funds to the building of a sustainable society, e.g., investments and loans that contribute to climate change countermeasures, a circular economy, and the realization of the nature-positive approach. It will also facilitate the efforts to realize and carry out the "Pro-Growth Carbon Pricing Concept" and the greening of the tax system as a whole. Furthermore, Japan will proactively facilitate the following efforts: public procurement as a means to create demand for green products and services, including advanced products and services developed by environmental start-ups and other entities; collection and disclosure of environmental information, e.g., through the use of DX; and evaluation of environmental loads from value chains.

Japan will respond to large-scale industrial structural changes and realize just transition to a sustainable society in such fields as the labor force. It will also promote human capital and other investment along with the creation of new "quality employment" (decent work), e.g., by providing support to start-ups engaging in the field of the environment.

(1) Further investment in natural capital as well as in tangible and intangible capital that maintain, restore, and enhance natural capital

Japan should dramatically improve environmental efficiency, including resource productivity and carbon productivity, and reduce total environmental loads to accelerate the absolute decoupling of economic growth.

To this end, it is important to expand investment in natural capital as well as in tangible and intangible assets to maintain, restore, and enhance natural capital, which will contribute to reducing the input of natural resources and carbon,[134] which leads to improving related capital stock. In this process, Japan considers it important to see the fact that innovation can be created not only by the development of cutting-edge technologies but also by the combination and roll-out of technologies that have already been demonstrated and implemented. From this viewpoint, we should encourage investment in technologies and assets that meet the essential needs of citizens now and in the future (mainly, measures for addressing the denominator in resource productivity and carbon productivity).

A pathway to achieve an absolute decoupling of the reduction of environmental loads from economic growth needs to decouple the growth in value added from natural resources and carbon input. To achieve this, utilizing intangible assets, which generally have smaller environmental loads than tangible assets, is indispensable. This approach will contribute to improving the situation where the growth of value-added productivity in the manufacturing sector of Japan was lower than the growth of physical productivity in the 2000s[135] and to improving non-price competitiveness (mainly measures for addressing the numerator part in resource productivity and carbon productivity).

In this process, it is necessary to green and coevolve consumption behavior and corporate behavior (production behavior). Specifically, the following actions are considered important: shifting consumer awareness and behavior from that focusing on quantitative and price value to that focusing on quality and high added value; expanding investment in economic competencies, or the investment needed to transfer human capital investment, investment in organization capital, and environmental value—which are elements contributing to developing a system for fostering and organizing human resources as a pillar supporting corporate behavior (production behavior)—to added value; and developing an information infrastructure that serves as a foundation for encouraging consumers to raise awareness of and take actions for focusing on quality products and services with high added value as well as for developing a system for fostering and organizing human resources.

(Expanded introduction of renewable energy in harmony with local communities to the maximum extent possible)

[134] The term "carbon" hereby refers to carbon not falling under circular use.
[135] Ministry of the Environment, "Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan 2017" (2017).

As an effort to achieve net-zero emissions by 2050, Japan will accelerate to the maximum extent possible the introduction of renewable energy, which is a representative of "renewable resources, such as recycled resources and biomass resources."[136]

Expanding the introduction of renewable energy is one of the most important issues in II2ES for the following targets, for example: reducing the import value of fossil fuels, which amounted to 33.7 trillion yen in 2022 and 27.3 trillion yen in 2023 (according to the preliminary report released in January 2024); improving Japan's competitiveness for business locations amid the trend in decarbonization of the entire value chain; ensuring energy security by reducing Japan's dependency on overseas energy; and vitalizing regional areas by realizing a self-sustaining and decentralized national land structure and expanding regional economic circulation, which are issues to be explained in Items 2 and 3 of this chapter.

While taking advantage of its potential for renewable energy as seen in the fact that Japan has the world's sixth largest national area, including territorial waters and exclusive economic zones (EEZs), Japan should secure the amount of renewable energy necessary to achieve net-zero emissions by 2050 and improve its competitiveness for business locations to the level comparable to other developed countries and, to this end, it needs to introduce renewable energy to the maximum extent possible. On the path leading to these goals, we should adopt environmental considerations, e.g., biodiversity conservation, and contribute to the maintenance, restoration, and enhancement of natural capital and the reduction of total environmental loads.

To this end, Japan will actively deploy offshore wind power generation in its EEZs, support businesses in steadily conducting projects, e.g., in Decarbonization Leading Areas and for priority measures. At the same time, it will work with prefectures, regional financial institutions, and regional energy companies to roll out the results of such projects. In this process, Japan will advance the following efforts: promoting the introduction of renewable energy heat supply facilities; facilitating decarbonization in the thermal sector tailored to community demand; promoting the introduction of renewable energy power generation, e.g., generation of geothermal power, floating offshore wind power, and tidal power in harmony with local communities; facilitating appropriate farm-based solar power generation and circular use of agricultural and forestry biomass, etc.; and building hydrogen supply chains in which regional renewable energy is utilized.

[136] The phrase "renewable resources, such as recycled resources and biomass resources" here merely refers to iconic renewable resources and is not intended to exclude renewable energy resources that exist underground, such as geothermal power.

Japan will endeavor to advance such efforts as introducing storage batteries that do not impose burdens on power grids, storing power as hydrogen, and promoting optimal control of demand-side facilities so as to further increase the amount of renewable energy that can be introduced. Also, it will advance the implementation of self-reliant and decentralized renewable energy sources that do not depend on power grids in harmony with local communities, which can be achieved by developing new methods for installing facilities, e.g., on walls in addition to roofs. In addition, it will fortify power grids to address grid constraints in preparation for the mass introduction of renewable energy.

Furthermore, it will encourage Decarbonization Support Co., Ltd. to finance projects involving renewable energy as well as stimulate private investment in such projects, promote a measure for helping companies to decarbonize their entire value chains, and encourage efforts by startups and diverse entities under certain frameworks, e.g., "DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization)."

Through these efforts, Japan, as a member of developed countries, will contribute to achieving the pledge determined at COP28 of tripling global renewable energy capacity by 2030.

(Development of an environment for the introduction of renewable energy by avoiding trade-offs and by demonstrating synergies)

In light of the Kunming-Montreal Global Biodiversity Framework, global goals on biodiversity, we must simultaneously achieve a "society in harmony with nature" by 2050 and net-zero emissions by 2050, without conflicting with each other. To this end, a basic premise is that the introduction of renewable energy should be in harmony with nature. In order to avoid and minimize the trade-off between the sustainable enjoyment of nature's bounty and climate change mitigation measures as well as to achieve both the nature-positive and net-zero emissions, we need to prevent adverse effects on the environment caused by the inappropriate introduction of facilities for renewable energy generation and aim to proactively introduce renewable energy in harmony with local communities, while giving full consideration to building consensus in the local communities without harming the natural benefits of the local area. Such introduction of renewable energy that works in symbiosis with the earth and benefits communities should be expanded by encouraging companies to use the system for regional decarbonization promotion projects under the Act on Promotion of Global Warming Countermeasures, including the promotion of wide-area zoning and by advancing the establishment of a mechanism to further promote renewable energy projects that contribute to the sustainable development of communities in which such communities are encouraged to participate.

The key to advancing wind power generation business lies in preventing such business from being introduced in a manner that harms environmental conservation and, at the same time, in endeavoring to introduce the business by ensuring appropriate environmental considerations and working in harmony with communities to the maximum extent possible. To this end, Japan will advance deliberations on ideal approaches to an environmental impact assessment system. In particular, offshore wind power generation business is expected to be promoted as a key to making renewable energy the main source of power. As the "Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities" (Act No. 89 of 2018) was established to promote offshore wind power generation business, such offshore wind power generation business under this Act will be conducted in the sea area chosen based on the results of a marine environmental survey conducted by the government, and thereby Japan will advance efforts for realizing a system for ensuring more appropriate environmental considerations.[137] In addition, as for onshore wind power generation business, from the perspective of promoting the regional symbiosis based society while ensuring appropriate environmental considerations, the government will hold deliberations on the development of a new system that enables efficient and effective environmental impact assessments based on the environmental characteristics of communities, including screening according to the degree of environmental impact.

Japan will form projects for renewable energy in harmony with nature through collaborative efforts involving, e.g., showing appropriate locations based on environmental surveys by the government, developing technologies for the installation and management of renewable energy that contribute to the conservation and restoration of habitats for plants and animals, and OECMs and *satochi-satoyama*. It will also give consideration to the reduction of air pollutants backed by the introduction of renewable energy.

As emissions from solar power generation facilities are expected to significantly increase in the late 2030s onwards, Japan will take into consideration the "Interim Report of the Study Group on the Disposal and Recycling of Renewable Energy Power Generation Facilities" and, based on this report, advance discussions on the establishment of a new system to ensure the delivery

[137] On March 12, 2024, a Cabinet Decision was made on the Bill to Partially Amend the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities, and the bill was submitted to the 213th ordinary session of the Diet. The bill was to change the name of the Act to the "Act on the Development of Marine Renewable Energy Power Generation Facilities" and to establish the following measures:
- A scheme for permitting the installation of marine renewable energy power generation facilities in Japan's EEZ.
- A survey conducted by the government on the marine environment to designate areas in territorial waters, inland waters, and the EEZ, and special provisions on the Environmental Impact Assessment Act.

and collection of such facilities to promote and facilitate the reuse and recycling thereof.

(Proactive introduction of renewable energy through the use of public facilities and other buildings)

In case of the installation of solar panels on building roofs and other sections, it is considered to cause a smaller impact on the surrounding area and surrounding environment because it does not involve any land alteration and changes. Based on this view, Japan will make use of buildings and proactively encourage the introduction of renewable energy facilities in such locations.

For this purpose, Japan will advance the following efforts: making use of some existing frameworks, including the National Government Action Plans, the Local Government Action Plans, and the "Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities" (Act No. 100 of 2000) (hereinafter referred to as the "Act on Promoting Green Procurement"); encouraging the government and municipalities to take the lead in the introduction of renewable energy in public facilities and other locations by uniting efforts of the ministries and agencies; and tackling the creation of new demand for next-generation solar cells and other related technologies to encourage the public sector to lead emission reduction across society.

It will also promote the development of new methods for installing facilities on walls and other surfaces of buildings as well as on roofs, thereby advancing the introduction of renewable energy with a self-reliant and decentralized system not depending on power grids in harmony with local communities.

Furthermore, Japan will strongly promote the introduction of solar power generation facilities on roofs and walls of houses and buildings, including such institutional measures as support for the introduction of solar power generation facilities that incur no initial cost, support for the introduction of solar power generation facilities integrally built with walls and windows, and support for the conversion of the existing houses and buildings to the Net-Zero Energy Houses (ZEH) or the Net-Zero Energy Buildings (ZEB).

(Thorough promotion of energy conservation and II2ES through the promotion)

Energy conservation is an initiative that contributes to the reduction of carbon inputs and the realization of a decarbonized society by advancing the reduction of energy use.

In this context, Japan will make use of the "Act on Rationalization of Energy Use and Shift to Non-fossil Energy" (Act No. 49 of 1979) in the fields of household, business, industry, and transportation, and dramatically promote energy conservation efforts in a manner integrating regulations and support measures.

As part of this, it will support the introduction of energy-saving equipment in factories and other business locations over multiple fiscal years and help SMEs check their state of energy efficiency and conservation efforts.

Japan will also advance the following initiatives: demonstration and support for introducing ZEH and ZEB in new houses and buildings; support for enhancing energy conservation in existing houses, including support for retrofitting houses with insulated windows and introducing high-efficiency water heaters; support for retrofitting existing buildings for decarbonization; enhancing a request for the labeling of energy conservation performance in selling or renting houses and buildings; and promoting thorough enhancement of energy saving by city block-based energy use. In addition, bearing in mind a step-by-step enhancement of the existing energy efficiency and conservation standards for new houses and buildings to the level of ZEH and ZEB standards, which will start by FY2030 at the latest, Japan will advance discussions on measures for disseminating houses and buildings with higher energy efficiency and conservation performance.

In order to steadily implement the Local Government Action Plans under the Act on Promotion of Global Warming Countermeasures, the government will accelerate community unit-based decarbonization efforts, including energy conservation, by taking advantage of such efforts as Decarbonization Leading Areas and priority measures.

Through the above efforts, we will contribute as a member of developed countries toward achieving the goal agreed at COP28 to double the global average annual rate of energy efficiency improvements until 2030.

As indicated above, we will encourage investment in energy conservation, thereby leading the outcomes to various aspects of "well-being/quality of life," including economic and social growth and healthy lives, and achieving II2ES.[138]

[138] According to OECD Statistics, IEA, "World Energy Balances 2023," and OECD, "Innovation Indicators 2023," a positive correlation is seen in developed countries between the rate of innovation achievement and energy productivity and between energy productivity and labor productivity. Increased energy productivity is found to lead to the alleviation of air pollution if the use of fossil fuels is decreased.

(Promotion of decarbonization of electricity and heating with reduced environmental loads throughout the life cycle of facilities)

Toward the achievement of net-zero emissions by 2050, CO_2 emitted from power generation and hydrogen production should be separated, recovered, utilized, and stored (Carbon Dioxide Capture, Utilization and Storage (CCUS)/Carbon Recycling) and the stored carbon dioxide should be utilized to the maximum extent possible. Toward the early social implementation of CCUS/carbon recycling, the government will work with related ministries and agencies to establish related technology based on the roadmap that it has formulated. In addition, it will promote the supply and use of hydrogen, such as low-carbon hydrogen.

Furthermore, from the perspective of an integrated approach to address both net-zero emissions and environmental conservation of water and air, Japan will promote efforts for reducing emissions of nitrogen oxides (NOx) and other substances related to ammonia, which is expected to expand as a fuel and a hydrogen carrier, and efforts for energy use of livestock manure, including nitrate nitrogen in water sources, for community environmental preservation.

(Expansion of investment to promote resource circulation)

If a business takes the lead in Japan's resource circulation, it is important for the business to be appropriately evaluated by investors and to leverage the evaluation results to enhance corporate value and industrial competitiveness. Businesses are expected to proactively disclose information on their efforts for a circular economy and engage in constructive dialogue with investors, while investors are expected to appropriately evaluate these efforts and appropriately provide funds to the businesses. We will encourage these efforts for information disclosure and dialogues and thereby contribute to expanding investment.

(Expansion of investment that contributes to the realization of the nature-positive)

As all business activities of companies affect and depend on natural capital and biodiversity, the degradation of natural capital and biodiversity loss have been demonstrating clear risks to sustainable society and economy. In order to achieve the international goal of the nature-positive by 2030 as well as to make economic activities sustainable, it is necessary for Japan to change the current ideal state of society and the economy and shift to an economy that contributes to the realization of the nature-positive ("nature positive economies").

The transition to nature positive economies will involve a dramatic social and economic shift that requires a large amount of investments, and, at the same time, this is expected to create

significant business opportunities.

Accordingly, both the government and the private sector should mobilize their funds to further make investment in a manner to reduce nature-negative elements and increase nature-positive ones, while companies should provide solutions that contribute to the conservation and restoration of nature so as to increase the stock of natural capital. These endeavors are considered important in realizing the nature-positive across society. To achieve these, Japan will advance the following efforts: evaluating the economic value of local natural capital from the perspective of stimulating investment in communities; encouraging companies to take on efforts for promoting local biodiversity under the Nationally Certified Sustainably Managed Natural Sites program and the certification scheme that acknowledge the organizations that support such sites; promoting initiatives for supporting green infrastructures that make use of diverse functions of the natural environment from both tangible and intangible aspects, e.g., social capital development and land use; and promoting green transformation (GX) for urban development to secure green spaces in terms of both quality and quantity, e.g., by stimulating private investment.

(Expansion of human capital investment by enhancing environmental education, etc.)
Raising public awareness of environmental issues requires the enhancement of environmental education for all stakeholders by taking advantage of all kinds of opportunities in accordance with the provisions of the "Act on the Promotion of Environmental Conservation Activities through Environmental Education" (Act No. 130 of 2003) and the Basic Policy that the government stipulated under this Act. Specifically, such education includes the following efforts: improving systematic and continuous learning to know about environmental education and the Education for Sustainable Development (ESD) in schools; and, as an effort to address the urgent situation of climate change and other environmental issues, utilizing intermediary support organizations and other bodies for cooperating with companies and non-government organizations engaging in decarbonization so that more effective environmental education and ESD can be provided in schools, workplaces, and social education facilities in a manner that such education becomes a trigger to change the behavior of all stakeholders and citizens across generations. Moreover, in the process of promoting environmental education and ESD, it is also important for stakeholders to bear in mind the viewpoints that they should maintain, restore, and enhance natural capital based on traditional wisdom and views of nature while having a sense of awe toward nature and that they should link the outcomes to solutions to socio-economic problems.

(Expansion of human capital investment and investment in organization capital through the development of environmental human resources, etc.)

Human capital investment should be improved in collaboration with companies and universities in communities as an effort to contribute to developing environmental human resources. Specifically, in 2023, we established a certification program called "Advisor for Decarbonization Program" and have been promoting efforts since then to allow human resources with appropriate knowledge on promoting decarbonization to fulfill their functions inside and outside of companies, and we will continue these efforts going forward. In addition, we will proactively promote the development of environmental human resources, including human resource development related to environmental impact assessment of offshore wind power generation, in collaboration with universities and other institutions. Meanwhile, against the backdrop that there is still not a sufficient pool of human resources with knowledge in the fields of both finance and the environment, e.g., climate change policies, we will develop a system in which the public and private sectors will share knowledge and experience to work together, aiming to promote policies for net-zero emissions, the circular economy, and the nature-positive from the perspective of finance.

As discussed in Item 5 "Development, demonstration, and social implementation of science, technology, and innovation to support 'new avenues for growth'" below, human capital investment, including support for startups in the field of the environment, should also be improved.

Moreover, we will actively encourage investment in organization capital to strengthen intermediary supporting functions that work to ascertain the essential needs of citizens and communities now and in the future, convert environmental value and performance into added value, and cultivate sales channels of goods and services with the added value.

(Expansion of human capital investment that contributes to just transition)

Improving "well-being/quality of life" will realize "new avenues for growth," and to this end, a variety of investments should be made to facilitate a just transition of workers to meet dramatic changes in industrial structures. Specifically, Japan will advance the creation of "quality employment" (decent work), e.g., by expanding investment in natural capital and capital that maintains, restores, and enhances the natural capital, which was mentioned above, and by expanding human capital investment to support startups in such fields as the environment. As an effort to achieve a just transition of workers, the proactive expansion of investment in intangible assets is also required, mainly focusing on investment in economic competencies,

e.g., improving education and training and encouraging workers to engage in the re-skilling initiative.

While keeping a close eye on movements involving the "trinity labor market reforms" ("Basic Policy on Economic and Fiscal Management and Reform 2023"; cabinet decision on June 16, 2023) and other policies, including supporting workers in improving their skills by the re-skilling initiative, Japan will create new employment, while taking into account institutional complementarity[139] from the perspective of II2ES, and effectively promote a just transition toward a sustainable society, e.g., conducting an effort for promoting human capital investment for a fair transition of the workforce, covering the so-called "employment ice-age generation" as well. In particular, in the process of promoting GX, Japan will focus on the "GX Promotion Strategies," simultaneously promoting the acquisition of new skills and a smooth labor transition to growth sectors, including green growth sectors, by providing measures for supporting a smooth labor transition to growth sectors and supporting current workers in job hunting to enhance their careers. Through these efforts, Japan will propel a just transition.

(2) Improvement of information that contributes to the appropriate assessment of environmental value in markets and achievement of high added value of goods and services by the improvement

In order to expand the investment mentioned in Item (1) above, companies should be appropriately evaluated in markets for the environmental value of their products and services and their environment-related efforts and businesses. To this end, Japan will promote the disclosure of sustainability-related information and the development of information infrastructure.

(Development of a platform for environmental information)

Citizens —including those who take the standpoint of consumers, civil society, and communities—often make decisions and take action based on environmental information held by a variety of stakeholders. From the perspective of the coevolution of consumption behavior and corporate behavior (production behavior), such information should be effectively and efficiently collected and disclosed, and information involving the essential needs of citizens now and in the future should be well organized, e.g., enhancement of scientific findings. To this end, Japan will promote the organization of such information, including efforts for expanding digital-related investment, and leverage the outcomes for the empowerment of citizens, i.e.,

[139] This also relates to social security and other systems.

encouraging citizens to make decisions and take action on their own initiative.

For example, as described in the section titled "Enhancement of competitive advantage by promoting the supply of green products and services and reducing environmental loads throughout the value chain" below, Japan will strive to appropriately disclose information on the current state of companies' efforts for simultaneously achieving net-zero emissions, the circular economy, and the nature-positive in an easy-to-understand manner.

Japan will also advance deliberations on the development of a system for the continuous disclosure of drawings and documents of environmental impact assessment, taking legal issues into consideration.

(Promotion of disclosure of information on sustainability)

In response to the Task Force on Climate-related Financial Disclosures (TCFD), the Taskforce on Nature-related Financial Disclosures (TNFD), and the Sustainability Disclosure Standards issued by the International Sustainability Standards Board (ISSB), companies have recently been requested by financial institutions and investors to disclose information on climate- and nature-related risks and opportunities as well as information on companies' responses thereto, while financial institutions and investors should ascertain their own climate-related risks and opportunities and make use of this information in their dialogue with their investment and financing partners. On the other hand, in order for companies, financial institutions, and investors to analyze and consider climate-related risks and opportunities and responses to them, it is necessary for them to improve the availability of reliable climate change impact forecasts and other data as well as to establish methods for assessing such risks and opportunities tailored to the business activities of companies. As for nature-related risks and opportunities, companies, on an individual basis, need to ascertain and assess the relationship of dependency and impacts between business activities and biodiversity or natural capital at their contact point in the entire corporate value chain, and they need to establish an assessment method for this purpose tailored to their needs. To address this, Japan will implement certain measures, e.g., specifying approaches that lead to the improvement of corporate value and support for disclosure, while responding to international trends, e.g., improving the accessibility of existing data, providing data in a way that meets demand, and presenting specific evaluation methods for risks and opportunities. In addition, Japan will take into consideration international trends, e.g., water-positive, or, or a concept of water conservation in which water supply capacity is greater than the water resources consumed by business activities, and, in response, it will take necessary measures that contribute to improving private companies' corporate value and sustainability

through their information disclosure on their efforts for environmental conservation and creation of a good environment.

(3) Coevolution of consumption behavior and corporate behavior (production behavior) placing environmental value at the core

In order for products and services with high environmental value, as described in Item (2) above, to be selected by citizens in their consumption behavior, companies need to expand the market for these products and services, further visualize the environmental loads per product or service, and encourage consumers to change their awareness of and actions related to environmental issues. In this section, we will discuss measures to coevolve consumption behavior and environmental mainstreaming in corporate behavior.

(Reduction and visualization of environmental loads by product)

As a platform for creating a market in which decarbonized and low-carbon products (green products) are selected, it is essential to have a system to visualize their emissions by product (carbon footprint of product ; CFP). To address this, Japan will support companies in promoting self-motivated efforts to calculate, reduce, and indicate the CFP of their products and services, e.g., by releasing the "Carbon Footprint Guidelines" (jointly formulated by the Ministry of Economy, Trade and Industry and the Ministry of the Environment in March 2023) and implementing model projects.

Moreover, industries that have large CO_2 emissions and need time and cost for decarbonization, such as the iron and steel industry and the chemical industry, need to make efforts to reduce emissions during the transition period with a view to achieving net-zero emissions by 2050 and also need to create a market for green products that the industries will provide as a result of their efforts. These emission reduction efforts by individual companies indispensably require the visualization of the effects of reduced environmental loads, e.g., CO_2 reductions, and the shift to added value. In this process, it is considered effective for these companies to use the mass balance method[140] to provide green products. However, compared to CFP, this idea has a lower social recognition and there are no standard rules for the method in markets. To address this, Japan will hold deliberations on the possibility of promoting the method going forward.

[140] This is a method in which manufacturers should strike a balance between environmental value and other characteristics between the "input" of raw materials, energy, etc. at the time of manufacturing and the "output" of products. The "Carbon Footprint Guidelines" jointly prepared by METI and MOE (March 2023) states that when manufacturers use the mass balance method in CFP calculation, they should consider the characteristics of the manufacturing process and appropriately allocate the CO2 emission reduction effect to the outcome products.

Currently, the business industries across supply chains have been advancing discussions and examinations on certain elements other than CO_2, e.g., biodiversity, water resources, and human rights, and this shows the importance of making reduction visible from a variety of viewpoints.

(Environmental mainstreaming in corporate behavior)

With regard to the greening of corporate behavior, Japan will aim for environmental mainstreaming in business and strive to disseminate and spread environment-related industries, e.g., by promoting environmental management and by encouraging decarbonization business, business related to the circular economy, and business created by companies' transition to the nature positive economies. It will also deploy the following various measures described in the sections below to promote environmental mainstreaming: promoting environmental management throughout the value chain; popularizing purchase contracts for green products and environmental considerations and green financing; and greening the tax system as a whole. In particular, climate change has already made various impacts on management resources (e.g., employees, materials, resources, products, facilities, funds, assets, technology, and trust), which are essential for private companies to conduct their business activities. As climate change is also expected to cause more impacts going forward, e.g., more severe and frequent weather disasters, extreme high temperatures, and sea level rise, if companies take the appropriate adaptation measures, this will help them to ensure sustainability, gain the trust of stakeholders, and make their business foundation resilient for years to come. Accordingly, taking these measures is considered an indispensable step for companies in envisioning corporate sustainability. While climate change will affect citizens' lives and industries in various ways, this is also expected to work to expand new markets (adaptation business) for products and services that help citizens and companies adapt to climate change.

"Carbon offsetting," a measure against climate change that members of society can take voluntarily, has been progressing in society. Carbon offsetting initiatives in Japan form a climate change countermeasure undertaken by the entire society, in which anyone can proactively participate, ranging not only from companies to municipalities to the government but also from general citizens to consumers, in a self-motivated manner by purchasing green products and attending environmental events. Japan will continue to promote carbon offset products and certified carbon neutral products.

(Creation of markets and demand through public procurement)

Increasing public procurement with environmental considerations will help create markets and demand through the dissemination of existing products and services. Also, in response to the

expansion of investment in natural capital, we consider it important to stimulate and create initial demand for cutting-edge decarbonized products and technologies across the country. As some excellent environmental products, technologies, and services[141] have not been widely utilized or are expected to be widely used in the future because only a few companies can submit a bid for the procurement of such products or the manufacturing costs of such products are high, the government should take the initiative in showing its intention to procure these products and services, taking into account the essential needs of citizens now and in the future and according to the National Action Plan and the Act on Promoting Green Procurement, thereby contributing to the creation of initial demand and encouraging companies to advance efforts for developing, socially implementing, and disseminating these products and services without falling into "path dependency" or "innovator's dilemma."

Utilizing the framework of the Act on Promoting Green Procurement, the Act on Promotion of Contracts of the State and Other Entities, Which Show Consideration for Reduction of Emissions of Greenhouse Gases, etc., the National Government Action Act, and the Local Government Action Plans, the ministries and agencies will work together to create demand for next-generation solar cells and other technologies, while the public sector will lead the way in promoting emission reductions throughout society.

In addition, Japan will strive to foster startups in the field of the environment, which are entities expected to become developers of these cutting-edge decarbonized products and technologies. (Specific support measures for environmental startups will be discussed below in Item 5 "Development, demonstration, and social implementation of science, technology, and innovation to support 'new avenues for growth'").

(Expansion of investment in economic competencies to promote change in the awareness and behavior of consumers)

As an approach to shifting the awareness and behavior of consumers, companies and producers should ascertain the potential and essential needs of consumers, and, at the same time, convert the environmental value and performance of their goods and services into those with added value. To this end, they need to accurately convey information on this added value to consumers. Meanwhile, the government should convey information on the latest scientific findings to citizens and encourage companies to invest in economic competencies, e.g., market research and marketing to identify environmental value and performance. We consider it important for

[141] Examples include green steel, CO2 absorbent concrete, carbon recycling cement, perovskite solar cells, e-methane, and e-fuel.

companies to create a virtuous cycle in which companies actively engaging in net-zero emissions, the circular economy, and a nature-positive are recognized in markets and this further propels companies' efforts. For this purpose, Japan will advance market-based studies on the relationship between (i) the initiatives taken and products offered by companies that contribute to the virtuous cycle and (ii) changes in consumers' behavior and will facilitate deliberations on promotion measures. Through these actions, Japan will coevolve consumption behavior and corporate behavior (production behavior).

Japan will encourage consumers to change their behavior, upholding the slogan titled "DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization)." Specific initiatives will be described in Item 4 "Realization of safe, secure, healthy, and fulfilling everyday lives that allows people to realize 'well-being/quality of life'" below.

(4) Enhancement of competitive advantage by promoting the supply of green products and services and reducing environmental loads throughout the value chain

In order to overcome the global environmental crisis, it is important to reduce environmental loads throughout the entire value chain. For example, the realization of net-zero emissions requires not only efforts taken by individual companies for reducing greenhouse gas emissions but also efforts taken therefor across value chains. These efforts will contribute to not only reducing environmental loads but also enhancing the international competitiveness of Japanese companies. Based on this idea, we will describe the government's measures below to reduce environmental loads from entire value chains.

(Visualization of environmental loads from entire value chains)

We will promote the development of an environment for calculating the emissions, including those in the value chain, the provision of support for such calculation, and the dissemination of CFP. At the same time, with regard to the GHG emissions accounting, reporting, and publicizing system, which is a basic system to ascertain GHG emissions from companies, we will consider revising the system so that it will also promote the reduction throughout the value chain, new initiatives such as CCUS/carbon recycling and absorption (removals), and so on. Meanwhile, in light of the fact that more and more companies have been advancing efforts to disclose information on biodiversity and the circular economy beyond climate change, Japan will also consider ideal approaches for companies to disclose information in an easy-to-understand and appropriate manner in which no excessive burdens are imposed on companies. Against the backdrop that global society has

been advancing the development of international rules for emission reduction from entire value chains, Japan will proactively participate in rule-making to ensure that the various reduction efforts of Japanese businesses are appropriately evaluated. Companies should, in their management, simultaneously achieve net-zero emissions, the circular economy, and the nature-positive and should reduce environmental loads from entire value chains, while increasing resilience and promoting comprehensive efforts that lead to the improvement of corporate value. To this end, Japan will prepare a guide as a well-organized collection of best practices, raise public awareness of the guide and disseminate it as integral part of preparation, and provide support to companies for their appropriate disclosure of information.

Focusing on companies' efforts to reduce the impact and burden on biodiversity and natural capital derived from business activities and to green value chains to create new value, Japan will provide support to companies in setting targets by utilizing natural capital-related data and sharing case studies and in promoting nature-related financial information disclosure, e.g., based on the TNFD, and promote inter-sectoral and cross-sectoral collaboration, thereby striving to encourage companies to enhance corporate value and aiming to attract investment in companies engaging in nature-positive management.

(Building sustainable value chains)

As part of efforts related to business and human rights, companies should work on environmental due diligence, which is risk management for environmental issues, in addition to conventional human rights due diligence. We will thoroughly raise awareness of efforts for environmental due diligence among companies to help them realize responsible value chains.

(Promotion of thorough resource circulation throughout entire value chains)

The transition to a circular economy will contribute to minimizing resource consumption, curbing waste generation, and reducing environmental loads. In addition, taking into account the current international situation, including moves to strengthen international resource security and tighten regulations in Europe, the transition will also help Japan not only to secure resources, address resource constraints, and strengthen international industrial competitiveness, but also enhance economic security. In light of this, Japan will promote a circular-economy approach, which is effective in improving the degree of resource efficiency and circulation throughout entire value chains, and also facilitate thorough resource circulation throughout the entire value chains.

(Establishment of a food system in harmony with the environment)

As part of the effort to build a sustainable food system in harmony with the environment, the government formulated the "MIDORI Strategy for Sustainable Food Systems" in May 2021, aiming to achieve both productivity improvement and sustainability in the food, agriculture, forestry, and fisheries industries by taking advantage of innovation. The strategy sets 14 KPIs to be achieved by 2050, including the reduction of greenhouse gas emissions and reduced use of chemical pesticides and fertilizers, and expansion of the agricultural area devoted to organic agriculture. As an interim target, Japan set the KPI 2030 goals in June 2022.

Taking advantage of the plan approval system under the MIDORI Act (Act No. 37 of 2022), which came into effect in July 2022, Japan will encourage producers to advance efforts for reducing their environmental loads, e.g., reducing greenhouse gas emissions, reducing the use of chemical pesticides and fertilizers, and encourage businesses to strive to disseminate and expand technologies useful for reducing environmental loads. In addition, targeting all subsidy projects conducted by the Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan will introduce "cross-compliance" to require the operators of such projects to carry out the minimum efforts needed to be done for reducing environmental loads. In addition, as a measure to enhance consumers' understanding of producers' efforts to reduce environmental loads and help consumers choose green products and services, Japan will also facilitate the "visualization" of such efforts to reduce environmental loads. Furthermore, taking advantage of the J-Credit Scheme, a system in which the government certifies the amount of greenhouse gas emissions reduced and removed by sinks as credits, Japan will encourage companies in the agriculture, forestry, and fisheries sectors to make use of the scheme to attract private funds.

In addition, under the Biodiversity Strategy of the Ministry of Agriculture, Forestry and Fisheries, the government, setting the year 2030 as a goal, aims to create a society in which both the environment and the economy are circulated and improved by taking advantage of the nature's bounty nurtured by rural areas.

(5) Economy-wide greening through finance, taxation, etc.

Through the expansion of environmental finance and the greening of the entire tax system, Japan will promote the greening of the economic system, including the correction of market failures, such as the internalization of external diseconomies.

(Promotion of sustainable finance, including ESG finance)

In line with the expansion of sustainable finance, including ESG finance, around the world,

Japan has taken various measures that contribute to developing the domestic market, and as a result, the ratio of the sustainable investment amount to total managed assets in Japan is rising. Going forward, it is necessary to make constant efforts to improve not only the quantitative aspect but also the qualitative ones from the viewpoint of addressing greenwashing concerns. In light of this, Japan will continue to encourage related parties, including corporations and financial institutions, to improve their efforts for information disclosure and its quality assurance, and it will also organize the environment necessary for the development of the domestic market for green finance, e.g., by improving the list of eligible green projects for use of proceeds to further clarify the criteria for determining greenness in the Green Bond and other Guidelines.

In Japan, environmental measures have conventionally been promoted based on compliance with laws and regulations and voluntary efforts by individual companies. However, as a growing number of institutional investors and financial institutions have mainly been regarding environmental initiatives by companies and business units as one of the important factors in determining investment and financing targets, including ESG finance and other forms of sustainable finance, companies and business projects that take advanced measures in a wide range of environmental fields, including biodiversity, natural capital, resource circulation, and environmental pollution control (e.g., chemicals control), as well as climate change, should be appropriately evaluated. In this context, Japan will work to create an environment for the appropriate evaluation of such companies.

(Appropriate expansion of green finance markets using private capital)

Propelling the shift to a socio-economy that achieves net-zero emissions, a circular economy, and nature-positive requires the curbing of public burdens and the effective use of private-sector funds. As an effort to promote the introduction of private capital into such projects by appropriately expanding green finance markets, Japan will support companies, local governments, and other entities in fundraising by using a green finance method. In addition, as such economic and social shift requires not only the social implementation of existing technologies but also innovation, Japan will hold deliberations on and provide support for the creation of a system to evaluate the impact of investments so that environmental startups are appropriately evaluated, investments are attracted, and the generation of innovation is accelerated.

(Greening of the whole tax system)

Japan will conduct comprehensive and systematic research and analysis on the environmental effects of environment-related tax systems, including the situations in other countries, not only

covering energy taxation, motor vehicle taxation, and other global warming-related tax systems but also taking into consideration the viewpoint of resource circulation and nature-positive, and then will continue to promote the greening of the tax system as a whole. In addition to the use of taxes for global warming countermeasures, Japan will focus on carbon pricing and steadily achieve and implement the Pro-Growth Carbon Pricing Concept based on the "Act on the Promotion of Smooth Transition to a Decarbonized, Growth-Oriented Economic Structure" (Act No. 32 of 2023; hereinafter referred to as the "GX Promotion Act") and the GX Promotion Strategy under the GX Promotion Act, thereby accelerating GHG emission reduction. Moreover, it will analyze the environmental conservation effects of these measures and II2ES and make use of the results in the study of the tax system.

2. Enhancement of the value of national land as stock placing natural capital as a basis

(Basic concept)

Japan is a country with forests covering approximately 70% of its land area, surrounded by the sea on all sides, having a humid climate and excellent seasonal winds, and generally having four distinct seasons. The Japanese archipelago is long and narrow from north to south, has a high percentage of endemic species, and is home to a globally top-level rich and diverse biota. Japan has been blessed with a beautiful natural environment based on biodiversity, and the people benefit from rich ecosystem services, which support their everyday lives and economic activities.

Since ancient times, Japan has been called *Toyoashihara-no-mizuho-no-kuni* (or land of abundant growth of all things), and the people have nurtured a culture in which humans live in accordance with the changing seasons in the country where all life grows richly. On the other hand, the people have been forced to always live with the fear of natural disasters, such as earthquakes, volcanic eruptions, and landslides. Therefore, in the face of the rich but violent natural environment, the people have cultivated a wide range of knowledge, techniques, characteristic arts, rich sensitivity, a sense of beauty as well as diverse cultures that adapt to nature instead of conflicting with nature. Through this process, it is thought that our traditional view of nature was formed where we value life in harmony with nature. *Haiku* or traditional short-form poetry, for example, represents the beauty and fragility that people find in seasonal biodiversity in 17 characters.

However, human activities are now causing the emergence of various problems, such as the worsening effects of climate change, biodiversity loss, and the need to secure food, water, and other resources. Looking at Japan, amid the declining population, falling birthrate, and aging

population, the shortage of people who can manage the natural environment has been causing an insufficient use of resources, resulting in persistent problems, e.g., resource degradation. As the relationship between the natural environment and the activities conducted on the national land is being questioned, the present generation has the duty to pass on a diverse and affluent natural environment to future generations. For this purpose, Japan should enhance the beauty and diversity of the national land, which consists of diverse and affluent natural environments, maintain, restore, and enhance natural capital, and integrally promote a variety of measures for national land management that ensures the sustainable use of natural capital, and strive to build "green national land" in which people and nature can rebuild a good relationship and people can enjoy the ceaseless nature's bounty, thereby realizing "well-being/quality of life" for citizens now and in the future.

In light of the changes in social life caused by the COVID-19 pandemic and other factors in recent years, Japan should correct the unipolar concentration of the population in large cities and realize a multilayered, multi-polar national land structure from the perspective of achieving a self-reliant and decentralized society. In particular, it is pivotal for communities to take the initiative and utilize their natural capital as their strong point, leading to improving the vitality of the whole of Japan, which is composed of diverse regional areas rich in unique features. In this context, it should advance the following indispensable efforts: promoting the cultivation of community attractiveness; encouraging communities to have interest in, feel fondness for, and take responsibility for their communities, while attracting migration to regional areas; and propelling measures that contribute to increasing the population in certain communities by taking advantage of various forms, e.g., dual-location lifestyle, workations, and tourism.

In the approach to building sustainable and attractive cities, the following initiatives are considered helpful for CO_2 emission reduction (including the efficient use of decarbonized power sources and fuels) through a decrease in the amount of automobile traffic[142]: enhancing the downsizing of cities; forming sustainable networks of community public transportation; promoting the use of public transportation, including railways; and developing safe and secure spaces for walking, bicycling, etc. These initiatives are also expected to contribute to the revitalization of city centers, the maintenance and improvement of people's health backed by increased opportunities for walking and bicycling, and the reduction of urban maintenance costs.

[142] "Development of relatively inexpensive land is possible in cities with diffuse urban areas. Those activities could make it easier to secure a larger footprint for buildings, and commercial floor space tends to become larger as a result. Since such growth correlates with greater energy consumption for lighting, air conditioning, and others, it may also have an impact on increased CO2 emissions in the commercial sector. (Figure 1-2-8)." (Ministry of the Environment, "Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan 2015" (2015)).

In addition, Japan should guide people to live in safer communities, e.g., by encouraging people to move from areas with high disaster risk to those with low disaster risk, and also should restore the natural environment in communities with high disaster risk. It also should accumulate good housing stock that serves as a basis of comfortable lives for people and proactively promote the development of man-made capital and systems that maintain, restore and enhance natural capital, such as infrastructure for the spread of zero emission vehicles (ZEVs). In addition, we should develop a good environment in terms of the natural environment around us, including the enhancement of natural capital in cities, and should mitigate the heat island phenomenon as a countermeasure against heat illness. Advancing these measures is expected to contribute to improving various aspects of "well-being/quality of life," including health, and the attractiveness of safe and secure communities.

Aiming to realize a circulation and symbiosis based society that supports the sustainable use of ecosystem services and value-added goods and services that support the industries and people's lifestyles in Japan, Japan should integrally implement various measures,[143] including those described above, that increase the value of the national land, e.g., decarbonization, improvement of resilience, and utilization of natural capital and simultaneously solve economic and social challenges. To this end, taking certain perspectives is important, including Nature-based Solutions (NbS)[144] and a landscape approach.[145]

People in Japan have enjoyed the nature's bounty and cultivated a culture of living in harmony with the four seasons. Meanwhile, we have also been forced to live side by side with natural disasters, such as earthquakes, volcanic eruptions, and landslides. The Noto Peninsula Earthquake 2024 reminded us once again of the terror and wildness of nature and the difficulty of protecting human lives and the environment in the face of a major disaster. We need to build a society in which we spend our everyday lives while respecting nature with awe and living in harmony with nature, a source of blessings and threats, and build a self-sustaining, decentralized, and disaster-resistant country, because these actions form the very construction of a basis for the survival of humankind and will also serve as the basis for realizing "well-being/quality of life"

[143] As changes in industrial structure may bring about major changes in land use and the potential impacts on the regional economy and society, these measures should be integrally implemented, taking into account the perspective of a just transition as well in promoting these measures.
[144] This is an initiative to solve social issues by taking advantage of the functions of a healthy natural ecosystem, in which the natural environment is confirmed again as the foundation of society, economy, lifestyles, and culture, and the nature's bounty is used to solve diverse social issues, thereby contributing to achieving both human happiness and biodiversity.
[145] From the perspective of effectively promoting the conservation and sustainable use of biodiversity, this approach intends to achieve desirable land use through the participation of diverse stakeholders of communities and by coordinating with various initiatives to clarify synergies and trade-offs between biodiversity and other social issues in spatial planning on the map.

in the future.

(1) National land use to maintain, restore and enhance natural capital

From the perspective of making the natural capital of Japan and the world sustainable, it is necessary to consider the ideal approach to making use of national land and to maintaining, restoring, and enhancing natural capital. In recent years, Japan has been dependent on imports of resources and food from overseas, while, domestically, *satochi-satoyama* and agricultural lands have not been fully utilized, leading to a security problem and causing the loss of natural capital, including domestic and overseas biodiversity. This exactly causes not only the degradation of nearby natural capital, which we should utilize, but also the degradation of natural capital in other countries, where it is difficult to perceive the changes.

Based on this problem awareness, we will discuss below the ideal approach to national land use to maintain, restore, and enhance natural capital in communities, including a favorable environment and biodiversity.

(Achievement of the 30by30 target by improving national parks and establishing OECM)
Japan should promote the expansion of protected areas, e.g., national parks, and the establishment of Other Effective area-based Conservation Measures (OECMs) and the effective conservation of at least 30% of national land and sea with the connection between forests, the countryside, rivers, and the seas in mind, thereby enhancing the resilience of natural capital and improving the value of the national land stock. In particular, as promoting nationwide private-sector initiatives is indispensable to realize nature-positive and achieve the 30by30 target, Japan will take measures for stimulating voluntary initiatives by the private sector and other entities, including certifying such initiatives under the Nationally Certified Sustainably Managed Natural Sites program.

Realizing the nature-positive requires not only the existing good natural environment sites but also the further restoration of degraded ecosystems. Based on this recognition, Japan will aim to achieve the international goal of ensuring at least 30% of degraded ecosystems under effective restoration through promoting nature restoration projects and private and other initiatives across the country. In addition, taking into account a further population decline and more depopulation in the future, Japan will hold discussions on necessary nature restoration in communities where people are facing difficulty in managing and utilizing nature.

To this end, it is important to visualize the current status of biodiversity and the areas in which the conservation of biodiversity is considered effective. For this purpose, Japan will strive to establish and provide a method in which such status and areas are "visualized" targeting entire national land, including the effects of conservation activities, and the results are evaluated and ascertained, including the qualitative changes in ecosystems.

(Formation of a wide-area ecosystem network)

From the perspective of improving the quality of national land use, it is considered important to take the decreasing pressure to develop a city backed by population decline as an opportunity, improve the quality of the natural environment across Japan, and realize nature-positive. In light of this, we need to ensure the connection between forests, countryside, cities, rivers, and the sea, which is the keystone of a wide-area ecosystem network.

To this end, seeing from a standpoint of ecosystem management targeting the entire watershed, the government will advance efforts to conserve and restore forests, countryside, cities, rivers, and the sea as a continuous space on various scales in collaboration with related ministries and local governments, and it will advance awareness-raising activities, e.g., the "Connecting and Supporting Forests, the Countryside, Rivers and the Sea" project, aiming to disseminate an approach to the sustainable use of the nature's bounty among people's everyday lives and economic activities to raise public momentum for recognizing the benefits of nature and supporting nature.

In forming wide-area ecological networks, Japan will advance not only the designation of protection areas, e.g., Nature Conservation Areas and national parks, but also the establishment of OECMs, thereby appropriately allocating conservation zones. In particular, while taking into consideration the ecological connectivity of habitats for migratory birds and other animals, Japan will strive to protect and restore wetlands, e.g., lakes and marshes, in danger of disappearance or pollution due to city development and management abandonment, and proactively advance environmentally sound agriculture, e.g., organic agriculture, that fosters biodiversity, thereby facilitating the formation of ecological networks, also covering *satochi-satoyama* and other nearby natural environments. Moreover, from the perspective of conserving freshwater fish, which have suffered significant biodiversity loss, it will endeavor to protect and restore the environment rich in secondary nature, e.g., rice paddies, waterways, and reservoir lakes.

Looking at city areas, expectations are growing for green spaces' functions to solve

environmental issues, e.g., climate change countermeasures, secure biodiversity, and well-being enhancement. Against this backdrop, the government will promote the conservation of key green spaces by formulating national basic policies that set targets for the conservation of green spaces and the direction of public and private initiatives as well as by preparing a wide-area greening plan and a basic greening plan, and it will work comprehensively and systematically to secure green spaces that can be networked, seen from a wide-area perspective as well. Furthermore, Japan will promote some efforts for, e.g., improving the functions of the Ecosystem-based Disaster Risk Reduction (Eco-DRR) and green infrastructure, and greening lands that are less or not utilized, including the provision of related support to local governments, and will strive to systematically form ecological networks seen from a wide-area perspective.

(Promotion of the conservation and utilization of seagrass beds and tidal flats)

Seagrass beds and tidal flats have multifaceted functions, such as living organisms' spawning grounds and habitats or growing environments, water purification, and carbon dioxide removal and fixation. In recent years, expectations have been growing for OECM and blue carbon that contribute to the 30by30 target in the marine and coastal areas. Against this background, Japan will promote the following efforts: effectively utilizing dredged soil that has been generated from port and other construction sites to cover the sea bottom with the soil; backfilling deep holes, and conserving, restoring, and building blue infrastructure (seagrass meadows and macroalgal beds, tidal flats, and symbiosis-type port structures). At the same time, deploying the "satoumi" creation project, which promotes not only the conservation, restoration and creation of tidal flats, seagrass meadows, and seagrass beds but also the utilization of local resources (e.g., eco-tourism) in coastal areas so as to create a virtuous circulation of environmental conservation and utilization (e.g., of people, goods, and funds) and lead the results to address various issues that coastal areas are confronted with (e.g., declining biodiversity and bioproductivity, depopulation, aging society with a low birthrate, and declining frequencies when people engage in nature).

(Conservation, restoration, and creation of river, marine, and lake environments)

Japan will facilitate the conservation and creation of living organisms' habitats, and growth and reproduction environments and those of diverse riverine landscapes and will promote the building of ecological networks placing rivers at the core. In this process, Japan will place an eye on the natural order of rivers as a whole, take into consideration the harmony of rivers with community lifestyles, history, and culture of people, and, moreover, shift the perspective also to river basins. In addition, it will also propel the restoration of the living organisms' habitats, and growth and reproduction environments that had been lost due to the past development and other

human activities, working with diverse stakeholders in communities.

As for ports and harbors, Japan will advance education, in collaboration with communities, on the roles of ports and harbors and the sea in view of culture and history, while providing opportunities to experience nature. In addition, it will also promote the wide-area, comprehensive conservation of the natural environment in coastal areas in cooperation with stakeholders. Furthermore, it will propel the restoration and creation of a good environment by developing beaches, seagrass beds, and tidal flats, conducting sand covering, and developing port structures and green areas in symbiosis with living organisms.

Targeting rivers and other bodies of water where the water environment has deteriorated significantly, Japan will take measures to purify the water by dredging and other measures and to prevent overflow weirs in combined sewer systems during rainy weather, while facilitating comprehensive water quality improvement measures targeting lakes and enclosed sea areas, including water purification by making use of wastewater effluent regulations and aquatic plants and the conservation and environmental restoration of seagrass beds and tidal flats. In addition, we will tackle the conservation of the marine environment, e.g., by dredging and removing sludge accumulated on the seabed and by collecting garbage and oil in ports and surrounding waters.

(Restoration of biodiversity by countermeasures against wildlife and alien species and by conservation of rare species)

Japan will enhance wildlife management targeting sika deer and other wildlife that cause serious damage to ecosystems, take comprehensive measures against alien species by advancing control projects for controlling wildlife focusing on areas important for biodiversity conservation and by enhancing collaboration between related stakeholders in communities, and improve wildlife habitats and growth conditions through carrying out the conservation of rare species, thereby striving to restore biodiversity.

(Minimization of chemical risks to ecosystems and prevention of pollution)

Target 7 of the Kunming-Montreal Global Biodiversity Framework requires member states to "reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including: reducing excess nutrients lost to the environment; reducing the overall risk from pesticides and highly hazardous chemicals; and also preventing, reducing, and working towards eliminating plastic pollution." Toward the achievement of this target, Japan

will make efforts to minimize chemical risks to ecosystems and prevent pollution and to conserve natural capital.

(Management and conservation of forests)

Forests have multifaceted functions, such as land conservation, fostering of water sources, biodiversity conservation, and global warming prevention. Aiming to keep these functions fully working throughout the future, Japan will promote efforts to manage and conserve forests, taking into account the current status and natural conditions of, and community needs for forests. In addition, aiming to cope with an increase in heavy rainfall backed by climate change, Japan will accelerate initiatives for building national resilience by conducting measures for forest improvement and landslide control. Furthermore, aiming to shift to diverse and healthy forests that generate less cedar pollen as a measure against pollinosis, it will cut down and utilize cedar trees in artificial forests, and replace such trees with seedlings of other types of trees that generate less pollen.

(Green growth in the forest and forestry industry and the wood industry)

As trees in forests planted in the postwar period have entered a period of fully matured to be used as wood, Japan will work to build a stable and sustainable supply system for domestic wood and to develop and improve the forestry and wood industries while enhancing these industries' sustainability at the same time. In this process, it will take on the following actions, for example: ensuring the appropriate management and use of forest resources; developing initiatives for new forestry; strengthening the international and regional competitiveness of the wood industry; creating a "second forest" in urban areas; and creating new value for mountain villages. Through conducting these efforts, Japan will aim to realize green growth that contributes to the improvement of socio-economic life and to net-zero emissions and GX.

(Creation of a good environment)

Aiming to create a good environment, Japan will strive to conduct the following efforts, for example: improving the well-being of community residents and revitalizing communities through the conservation of nature and culture serving as natural capital and social capital unique to the communities, e.g., rich watersides, starry skies, and soundscapes; achieving comprehensive control of a water environment that contributes not only to water quality management but also to biodiversity conservation and community building; developing a model for integrated watershed conservation in which communities engage in the creation of a good environment targeting water supply sources ranging from forests to rivers to the sea while making use of OECM; and advancing the "satoumi" creation project that aims for establishing

a virtuous circulation between the promotion of the conservation, restoration, and creation of tidal flats, seaweed beds, and seagrass beds and the utilization of the results as local resources.

(2) Promotion of a self-reliant and decentralized national land structure

Social demand for the realization of a self-reliant and decentralized society has been growing, backed by the strengthening of resilience against the frequent occurrence of weather and other disasters in recent years and the changes in social life caused by the recent COVID-19 pandemic. To meet this demand, Japan should encourage communities to take the initiative to utilize their natural capital as their strong point and to promote community building to enhance their attractiveness. In addition, Japan should advance the following efforts from the perspective of the environment: introducing a decentralized and self-reliant energy system in communities, e.g., a renewable energy system, and developing sustainable societies to address aging social infrastructure in which disaster prevention measures are in harmony with biodiversity conservation. According to a survey conducted by the Cabinet Office, many Tokyo residents who are interested in migrating to a regional area answered that "the low population density and rich natural environment" is the reason for their interest in migration. This fact leads to the expectation that the maintenance, recovery, enhancement, and utilization of the natural capital in communities may stimulate the migration of people to regional areas or a dual-location lifestyle.

Based on this idea, we will describe Japan's transition to a self-reliant and decentralized national land structure that takes advantage of community natural capital, e.g., a renewable energy system, and nature, and biodiversity.

(Introduction of a self-reliant and decentralized based and regional symbiosis based renewable energy system)

Concerning renewable energy as the natural capital of communities, Japan should make maximum use of the following energy: solar power, wind power, biomass resources, geothermal power generation—which is highly based on communities—regional symbiosis based offshore wind power and tidal power generation, renewable energy heat (e.g., solar heat, geothermal heat, snow and ice heat, hot spring heat, sea water heat, river heat, and sewage heat), and unused waste heat in a manner that is in harmony with the nature and society of communities, thereby developing projects, e.g., for forming a decentralized and self-reliant energy society and enhancing the resilience of society based on a model developed for local production for local consumption of energy as well as for migration to other communities, so as to achieve

employment creation, community revitalization, and expanded circular economies. Desirably, this approach could be advanced in a form that such projects—whether they are large ones undertaken by businesses located outside the target communities or not—will benefit the communities. Specific support measures for the introduction of renewable energy in communities will be discussed in Item 3 "Development of communities as a place to implement II2ES" below.

(Realization of a "virtuous cycle of protection and use" in *Satochi-Satoyama*, *Satoumi*, forests, natural parks, etc.)

Japan will promote the conservation and utilization of *satochi-satoyama* (community-based forest areas and the surrounding countryside), *"satoumi"*, forests, and natural parks, which are important natural capital of communities. In particular, focusing on national parks, which are sites with outstanding natural environments, Japan will facilitate a project titled "Project to Fully Enjoy National Parks," an initiative for encouraging people to utilize national parks while preserving the natural environment. In addition, it will propel stayover tourism with added value in national parks, in parallel with making use of private funds, and attract more tourists inside and outside Japan to vitalize communities. It will also steadily improve and upgrade facilities, e.g., in national parks, for helping tourists use parks safely and comfortably, thereby realizing a "virtuous cycle of conservation and use" in which reinvestment in the conservation of the natural environment is made. Also, it will promote tourism and other activities that focus on the importance of ecosystems, species, and populations that are unique to each region. In advancing the initiatives of the s*atochi-satoyama* and the *"satoumi"* creation, Japan will conserve biodiversity by encouraging private and other efforts, including the Nationally Certified Sustainably Managed Natural Sites program that issues certifications to outstanding companies, and also it will strive to make use of natural resources so as to vitalize communities, thereby aiming to simultaneously solve environmental, economic, and social issues in communities. In this process, it is considered important to integrally take on related efforts to gain more effective results, e.g., by collaborating with initiatives related to decarbonization and Circular and Ecological Economy.

(Promotion of the "Nature-based Solutions (NbS)")

By leveraging the multifunctional qualities of nature, Japan will promote the Nature-based Solutions (NbS), which aim to resolve multiple social challenges, e.g., climate change, biodiversity, water source fostering, socioeconomic development, population decline, and depopulation. In particular, as a country prone to natural disasters (e.g., earthquakes and torrential rains) and facing environmental changes (e.g., climate change causing more severe

disasters) and social problems (e.g., aging social infrastructure) in recent years, Japan will promote a review of land use to avoid disasters and pursue efforts for green infrastructure and the Ecosystem-based Disaster Risk Reduction (Eco-DRR), some of which take traditional knowledge on community development into consideration in utilizing nature and mountain control measures to improve the functions of forests. In addition, as an effort to realize the MIDORI Strategy for Sustainable Food Systems, the government will work to build a sustainable food system and, under the Green Infrastructure Promotion Strategy 2023, it will aim to implement green infrastructure in society in all fields and situations by conducting the following efforts: advancing the Green Infrastructure Public-Private Partnership Platform; raising public momentum jointly with economic associations; developing related technologies; advancing the horizontal dissemination of leading case examples; and establishing a practical evaluation method.

(3) Realization of cities and communities where people can feel "well-being/quality of life"

In Item (2) "Promotion of a self-reliant and decentralized national land structure" above, we mentioned Japan's need for a transition to a self-reliant and decentralized society to meet social demand. From the perspective of the "well-being/quality of life" of citizens, it is also important that each of the self-reliant and decentralized communities should be those where people feel easy in spending their everyday lives. Based on this idea, we will discuss measures to realize cities and communities where people can feel "well-being/quality of life."

(Promoting urban compacts plus networks)

Japan will facilitate the "Compact Plus Network," an initiative in which it will prevent the expansion of city areas, and at the same time, tackle efforts for attracting both life service functions and residences and constructing public transportation networks in collaboration. In cases where compact cities enable the appropriate concentration of heat sources and demand for heat, support for the introduction of local heat supply systems could be effective in promoting local heat utilization as such systems will enhance the feasibility of unused regional renewable heat energies generated using solar, geothermal, snow and ice, and sewage, among others. In addition, Japan will develop an attractive space and environment where people can safely and comfortably travel on foot or by bicycle, promote the formation of a public transportation network placing a next-generation tram system (LRT) or bus rapid transit system (BRT) at the core, and encourage people to use the existing public transportation systems, including railways, thereby reducing the amount of automobile traffic and contributing to the reduction of greenhouse gas emissions and atmospheric pollution. Moreover, it will "visualize" the effects of

these measures on the reduction of environmental loads, leading to the further downsizing of cities. The Act on Promotion of Global Warming Countermeasures stipulates that "prefectures and municipalities are to give due consideration to ensuring that the reduction, etc. of the amount of greenhouse gas emissions is made for city planning, development plans for agricultural promotion areas and other measures related to the reduction in harmony with the achievement of the objectives of the measures." In light of this, Japan will encourage liaison between the location normalization plan that municipalities should prepare under the Act on Special Measures Concerning Urban Reconstruction and the action plans of local governments that they should prepare under the Act on Promotion of Global Warming Countermeasures, and will provide support across ministries and agencies for the implementation of the plans targeting locations in the residential induction areas. These efforts will aim to simultaneously solve environmental issues and socio-economic issues, e.g., population decline, so as to promote sustainable city development.

(Re-design of regional public transportation)

Community public transportation is not only an indispensable infrastructure for socio-economic activities in communities but also an essential local resource for building a Circular and Ecological Economy.

Also, such public transportation contributes to the reduction of total environmental loads by helping with the construction of a compact city structure[146] and the improvement of the public transportation sharing ratio, and it has various external economies as mentioned above. Meanwhile, it faces a difficult situation against the backdrop of a decrease in demand caused by a shrinking population and a shortage of drivers and other human resources. To address this, Japan will utilize all policy tools, e.g., legal systems and budgets, encourage collaboration with and cooperation (co-creation) of community stakeholders, including those in the fields of education, medical care, welfare, nursing care, and energy, and thereby accelerate the "re-designing" of community public transportation into that with high convenience, productivity, and sustainability, which will contribute to "well-being/quality of life."

(Decarbonization of mobility)

As an effort to expand the introduction of electrified vehicles, Japan will support companies and households in purchasing such vehicles and promote initiatives for greening road transportation, e.g., promoting the development of recharging and hydrogen refueling infrastructure. In addition, it will strive to advance the low-carbonization of the entire life cycle, e.g., road

[146] Ministry of the Environment, "Annual Report on the Environment in Japan 2006" (2006).

maintenance and management, to promote the decarbonization of road facilities. Moreover, it will propel the electrification of construction machinery.

Also, it will promote the decarbonization of railways, a key public transportation system, by introducing energy-saving and low-CO_2 vehicles, developing hydrogen fuel cell railcars, and effectively utilizing regenerative power generated during train deceleration. It will facilitate the introduction of renewable energy as well, e.g., from solar power generation, by taking advantage of abundant railway assets.

In the field of distribution, the government will promote distribution efficiency by supporting efforts to achieve a modal shift under the Act on Advancement of Integration and Streamlining of Distribution Business and by improving the environment for the use of double-trailer trucks. In addition, it will advance the introduction of equipment necessary for the use and storage of renewable energy electricity at distribution facilities and the implementation of vehicles that use such electricity in order to enhance decarbonization in distribution services, leading to facilitating green transformation (GX) in the field.

In the field of marine transportation, Japan will work on the development and introduction of zero-emission ships and other vessels and the establishment of production infrastructure therefor, and it also will execute leadership in discussions at the International Maritime Organization on developing an international framework that encourages the introduction of zero-emission ships.

In the field of ports and harbors, Japan will facilitate the formation of carbon neutral ports (CNPs) in which port functions with environmental considerations are upgraded for decarbonization and in which the environment for receiving hydrogen, ammonia, and other substances is improved.

Along with this, Japan will introduce renewable energy and energy conservation involving navigation sign equipment.

In the field of aviation, it will promote the introduction of sustainable aviation fuels (SAF), improve flight operations by upgrading air traffic control and management, introduce new aircraft environmental technologies, and promote the implementation of renewable energy hubs at airports.

Through the promotion of these efforts, Japan will aim to achieve net-zero emissions by 2050.

(Maintenance of community living areas in hilly and mountainous areas, etc.)

In hilly and mountainous areas marked with a sharp population decrease and aging, in particular, it is important to maintain a "community living area" as an integral zone for our everyday lives. In this way, we will promote the formation of "small hubs" in an effort to create a sustainable community. In energy supply, Japan will further introduce renewable energy utilizing local resources, including thermal energy, to achieve simultaneous solutions to both energy and economic circulation within communities and the reduction of greenhouse gas emissions. In addition, in order to innovate distribution by making our everyday lives more convenient, e.g., maintaining distribution networks and providing assistance for shopping, distribution DX will be promoted through the use of drones to improve productivity and decarbonization.

(Conservation and creation of beautiful landscapes)

In recent years, citizens have been becoming more aware of and interested in good landscapes, e.g., beautiful natural environments, cityscapes, and rural scenery, and communities have been advancing efforts to maintain, restore, and enhance landscapes or natural capital as seen in stipulating regulations over buildings and the removal of utility poles, which shows a tendency to enhance public recognition of the value that landscapes have. In addition, the preservation and creation of good landscapes can help to secure people's attachment to and identity in their communities and increase economic value, resulting in raising public awareness of "well-being/quality of life" in Japan. Meanwhile, the introduction of renewable energy facilities, such as onshore wind power generation, causes a challenge of impacts on landscape resources, and this shows us the importance of an ideal approach to technologies and social systems that are in harmony with landscapes. To address this, Japan will promote the conservation and creation of good landscapes, e.g., the conservation of a good natural environment, that are unique to communities, whether they are cities or regional areas, as Japan's precious natural capital and social capital.

(Natural capital, and measures against heat illness through investment in capital that maintains, restores, and enhances natural capital)

Based on the situation and future outlook of the hot climate environment and the concept of Nature-based Solutions (NbS), we will promote efforts for green infrastructure and thereby advance an effort for solving complex community issues, including city planning and city designing, by taking advantage of the multifaceted functions of the natural environment, including improving ground surface cover and mitigating heat in cities. It will also promote measures against urban heat island effects, e.g., reducing anthropogenic heat, improving city

structures, improving lifestyles, and conducting adaptation measures for reducing the impact of heat on human health.

(Disaster prevention, mitigation and national resilience of public facilities and infrastructure)

Photovoltaic power generation equipment (including perovskite solar cells) should be introduced in public facilities and infrastructure, e.g., schools (in which ministries and agencies will formulate a maintenance plan, set targets by facility type, and, based on this, manage a PDCA cycle) to the maximum extent possible, and public facilities and infrastructure, which will serve as disaster prevention centers in the event of a disaster, should mainly become targets of efforts for energy saving, life extension, and improvement of disaster prevention functions. Through these measures, Japan will advance decarbonization and national land resilience in an integrated manner.

(Enhancement of added value of houses and buildings as stock)

As an approach to allowing people to feel "well-being/quality of life," it is necessary to replace the living environment, e.g., houses and buildings as stock, with sustainable, high added value ones. The government will conduct thorough energy conservation by conducting the following efforts: introducing the ZEH or ZEB standards in new houses and buildings; renovating the existing houses and buildings into decarbonized ones, including the retrofitting of houses and buildings with insulated windows; enhancing the request for the labeling of energy conservation performance when selling or renting houses and buildings; and enhancing energy saving by city block-based energy use. In addition, bearing in mind a step-by-step enhancement of the existing energy efficiency and conservation standards for new houses and buildings to the level of ZEH or ZEB standards, Japan will endeavor to guide companies to meet higher energy efficiency and conservation performance. Moreover, aiming to facilitate the dissemination of houses that may last for a longer period in a good condition, it will strive to spread excellent long-term houses that meet a certain or higher level of requirements, e.g., for durability and maintenance-friendliness. Furthermore, the government will advance efforts for reducing CO_2 (Life Cycle CO2: LCCO2) generated during the construction, operation, and disposal of buildings. Also, in light of the outcomes, etc. of the G7 Hiroshima Summit in May 2023, Japan will encourage companies and households intending to build a house and building to use wood that is a sustainable low-carbon material and contributes to long-term carbon storage.

(Examination of the ideal land use for a Circular and Ecological Economy based on the perspective of a landscape approach, etc.)

Japan needs to address a variety of issues about II2ES involving land use, including the following: an increase in uninhabited areas caused by population decline; promotion of the Compact Plus Network initiative; changes in land use due to changes in industrial structure, achievement of the 30by30 target; further introduction of renewable energy in harmony with local communities; promotion of adaptation measures in communities; and ideal approaches to agriculture and rural areas from the perspective of food security (which are also the elements that constitute the Circular and Ecological Economy). For this purpose, we will hold discussions on an ideal approach to comprehensive land use from the perspective of II2ES, taking into account the characteristics of each regional area.

In particular, Japan will focus on renewable energy and, as a pathway to the realization of net-zero emissions by 2050, help each community discuss the ideal approach to community-wide land use in a manner that is in symbiosis with the community, including consideration for biodiversity, and through this process, Japan will introduce and expand such land use.

In addition, as the number of people responsible for land management becomes scarce due to the declining population, the perspective of a landscape approach is considered more important. In advancing this approach, Japan will promote the formulation of land conservation strategies for communities, while also taking into account the "visualization" of communities as important for the conservation of biodiversity. Moreover, it will facilitate support measures to carry out plans and activities in communities, including human resource development and mentoring.

(4) Development of an information infrastructure that contributes to sustainable use, conservation, and value enhancement of the national land

In the sections above, we have discussed approaches to national land use to make natural capital in Japan and the entire world sustainable, measures for a successful transition to a self-reliant and decentralized society, and measures for realizing communities where people can feel "well-being/quality of life." To implement these measures, stakeholders in communities, e.g., municipalities, need to have appropriate access to information on their own natural capital. Based on this idea, we will discuss the measures below to develop an information infrastructure that allows people to accurately ascertain information on natural capital in communities.

(Development of digital tools that contribute to land-use zoning toward the introduction of renewable energy in harmony with local communities)

As an effort for conducting support measures for decarbonization in communities, Japan will

improve the development of information infrastructure, e.g., Renewable Energy Potential System (REPOS) and Environmental Impact Assessment Database System (EADAS), and effectively link related infrastructure, thereby promoting sustainable land use in which both the promotion of renewable energy and the conservation of biodiversity are taken into consideration.

(Development of information infrastructure on local ecosystems)

Japan will advance the development of a map to visualize the current status of biodiversity, areas of importance in terms of conservation, the effects of conservation activities, and other data, which covers ranging from remote mountains to hilly and mountainous areas to city areas. It will also compile a "Japan Biodiversity Outlook (JBO)" to comprehensively assess the current status of biodiversity and ecosystem services in Japan and will analyze the effects of efforts conducted under the National Biodiversity Strategy and Action Plan of Japan. Moreover, it will utilize scientific information found in surveys, e.g., the National Survey on the Natural Environment and the Monitoring Sites 1000 project, to prepare a map of changes in the distribution of species and ecosystems, visualize the areas of importance in terms of conservation, and conduct an overlay analysis of a variety of data, thereby providing the data in a form that the national and local governments can utilize in drafting biodiversity conservation policies. It will publish the results in an easy-to-understand manner via Web-GIS and other means.

3. Development of communities as a place to implement II2ES

(Basic concept)

Sustainable communities are the foundation of a self-reliant and decentralized society and an important element of such society on par with the government and markets. Through the development of sustainable communities, Japan will endeavor to realize the "well-being/quality of life" of community residents.

Communities have their own unique resources, which are rich in variety, and potentials and can serve as effective models for achieving II2ES. Accordingly, from a long-term perspective, Japan should ascertain the characteristics and uniqueness of each community and the essential needs of community residents and, based on this, draw up a vision of the ideal state and desired state of communities to bring these communities closer to that vision. As an effort to achieve this, it should propel the establishment of a Circular and Ecological Economy. In this process, the government will make the maximum use of natural capital and other local resources in a sustainable manner, thereby leading to the improvement of socio-economic activities in

communities, e.g., widening the regional economic circulation as flows.

Renewable energy, in particular, which is natural capital unique to communities, is an important local resource not only in terms of addressing climate change in the process of transitioning away from fossil fuels but also in terms of preventing the outflows of energy-related capital[147] from communities to overseas. It is also important to utilize circulating and renewable resources to reduce the input of natural resources and final disposal of waste, as well as to expand regional economic circulation. These efforts are expected to reduce the total environmental loads associated with the mining and utilization of underground resources, contribute to achieving rich environmental conservation and restoration and realization of nature-positive, and generate the integration of and synergy among fields related to environmental policies. In addition, utilizing part of the profits from such projects to solve challenges that communities face, e.g., social welfare, preservation of traditional culture, and maintenance of agricultural infrastructure, is considered to encourage the shift of the regional economy to the economy having a virtuous circulation and contribute to simultaneous solutions to environmental challenges and socio-economic ones.[148]

In order to achieve the virtuous circulation of regional economies and simultaneous solutions to environmental challenges and socio-economic ones in communities, it is indispensable to develop human resources that play a leading role and build a community therefor. To this end, facilitating the dispatch of specialists to communities and building platforms of such specialists will work effectively in parallel with utilizing organizations with expertise in environmental conservation. In this process, we consider it important to take advantage of cultural aspects, e.g., the traditions, history, and culture unique to communities, and sports rooted in communities, from the perspective of encouraging community residents to participate in related efforts. Currently, Minamata City, Kumamoto Prefecture, and the Hamadori area in Fukushima Prefecture have been advancing the reconstruction and building of communities by focusing on the environment in which community residents and communities have been playing a central role. This shows a prime case example representing the importance of intangible assets, e.g., human resources and communities, in advancing community efforts.

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[147] As of 2018 (when fossil fuel imports—excluding non-energy imports—were approximately 16.8 trillion yen), more than 40% of municipalities had a deficit in the regional balance of energy payments, which is equivalent to 5% or more of the gross regional product (Ministry of the Environment, and Value Management Institute, Inc., "Analysis of Regional Economic Circulation: Detailed Version of the Common Guide on the Automatic Data Creation Tool to Analyze Regional Economic Circulation and the Tool to Analyze Regional Economic Ripple Effect" (Supplementary Guide), March 2023).

[148] For example, discovering new value in unused resources out of forest residues, livestock manure, raw garbage, and sewage sludge and utilizing them may lead to simultaneous solutions to environmental, economic, and social challenges.

We also consider it important to encourage regional financial institutions, which are a leading player in the regional economy, to promote ESG finance and to encourage regional SMEs to introduce environmental considerations in their actions, thereby further facilitating them to take action for resource conservation. Regional financial institutions should collaborate with municipalities, provide businesses with knowledge that contributes to the utilization of local resources, and provide loans and support to businesses that can lead the solutions to regional challenges to economic value, while regional companies should respond to these efforts and put green management into practice. This is an indispensable element for the realization of a Circular and Ecological Economy.

Meanwhile, the process of transitioning to a sustainable community as described above may bring about a change in business conditions and business withdrawal from communities in such industries as energy and manufacturing, which involve a large consumption of fossil fuels, and this may cause serious damage to the regional economy. To address this, we consider it significant to revitalize the regional economy in a long-term, systematic, and comprehensive manner from the perspective of a "just transition" in which actual conditions by community are considered and the transition proceeds so as not to leave any people or communities behind as much as possible.

(1) Simultaneous solutions to environmental challenges and socio-economic challenges in communities

Japan will integrally conduct some measures, e.g., net-zero emissions, circular economies, and nature-positive, to create synergetic effects and will coordinate these measures with other measures whose main purpose is to solve another socio-economic problem, thereby leading the outcomes to building a sustainable society.

(Promotion of decarbonization in communities)

Japan will take on decarbonization in communities in accordance with the "Plan for Global Warming Countermeasures" (cabinet decision on October 22, 2021). Under the plan, as part of the efforts for achieving net-zero emissions by 2050, Japan will select at least 100 Decarbonization Leading Areas by 2025 and, by utilizing support measures from various ministries and agencies, it will achieve net zero or minus emissions of carbon dioxide by 2030, the emissions derived from electricity consumption in the private sector (household sector and other-business sector). Moreover, it will show an ideal approach to achieving decarbonization

in communities that contributes to community revitalization in improving the attractiveness and quality. We also consider it significant to conduct decarbonization efforts in various areas, e.g., industry, everyday life, infrastructure, and transportation, in parallel with digital technologies, e.g., the introduction of energy management systems to strike a supply-demand balance of electricity. In light of this, Japan will fortify collaboration efforts between DX and GX measures by making use of digital technology under the Comprehensive Strategy for the Vision for a Digital Garden City Nation and other policies. Moreover, "DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization)," support for policy making in which citizens participate,[149] etc. are expected to stimulate collaboration between efforts tackled by residents and companies throughout a given community, including Decarbonization Leading Areas. Japan will hold discussions on building a model that achieves net-zero emissions of carbon dioxide from heat consumption.

Taking advantage of the national government's financial support, local governments should target all their administrative duties and projects, including those by public enterprises, take the initiative in implementing priority measures to the targets (e.g., introduction of symbiosis- and benefit-based renewable energy, introduction of the ZEB standards in public facilities, and introduction of electric vehicles in official vehicles), which become the key to decarbonization in communities, and dramatically accelerate efforts led by companies and community residents. In addition, as a response to disasters, which are expected to become more and more severe in the future, and power outage caused by such disasters, local governments should promote the development of renewable energy facilities that allow energy to be supplied to public facilities in the event of disasters.

In developing decarbonization in communities nationwide, the government will work with prefectures, regional financial institutions, regional energy companies, and other organizations to horizontally deploy the results of past efforts. In particular, prefectures are expected to take advantage of government financial support and regional fiscal measures, accelerate the introduction of renewable energy by prefectures, including public enterprises, support for the decarbonization of core regional companies, and decarbonization in the field of transportation. They are also anticipated to take advantage of a system for regional decarbonization promotion projects to promote zoning for promoting renewable energy over a wide area and take the initiative in promoting renewable energy in harmony with local communities, which is a community-led initiative contributing to communities, including support for the

[149] This includes "Smart Move," an initiative to promote eco-friendly transportation in people's everyday lives, such as the active use of public transportation, e.g., by railways, bicycles, and walking, and encourage eco-friendly driving habits.

decarbonization of regional enterprises. The government will provide necessary support to realize these efforts.

As part of the efforts to support the building of sustainable communities through decarbonization, Japan will ascertain the requirement of municipalities for installing solar panels in houses and buildings and the current status of the development of next-generation solar power generation, and, based on this, strongly promote the introduction of solar panels on the roofs, walls, and other sections of houses and buildings. The implementation of solar panels led by public works and public procurement will bring about initial demand for cutting-edge decarbonized products and technologies that contribute to a virtuous circulation between decarbonization and economic growth. As an effort for helping local governments lead and proactively facilitate the introduction of renewable energy, Japan will promote the development of a system that allows communities to become aware of the benefits of renewable energy, including local production for local consumption involving renewable energy and the assessment of renewable energy projects with environmental considerations. By establishing an "inter-community eco-system" that uses woody biomass resources in communities in a circulation manner as an energy source for heat utilization and cogeneration of heat and power, Japan will contribute to the revitalization of the regional economy and the maintenance and conservation of forests. Moreover, aiming to contribute to facilitating the formation of consensus with communities on geothermal development, Japan will collect and study scientific data by monitoring hot springs and promote geothermal utilization in harmony with nature in communities and society, thereby revitalizing the communities.

(Contribution to regional revitalization by transition to a circular economy)

Building a sound material-cycle society with high resource productivity even under the circumstances of a declining population, falling birthrate, and aging population requires the recycling of circular resources at an appropriate level tailored to communities, the continuous utilization of renewable resources in communities, the proper maintenance and management of community stock, and the efficient use of the stock for as long as possible, and through this approach, Japan should advance the building of sustainable and vital communities with less resource inputs and less waste generation. Also, as a driver to bring about solutions to regional challenges and the realization of regional revitalization, e.g., revitalization of communities, job creation, promotion of regional industries, dealing with the aging population, and ecosystem conservation, Japan will take on the following efforts: efforts for making the maximum use of resources by reducing food loss and waste and recycling food in the food system; reuse efforts—e.g., reuse of used products, circular use of organic waste (including food waste, human waste,

Johkasou [decentralized wastewater treatment system] sludge, and sewage sludge) and unused resources as a fertilizer and energy for biomass resources, expansion of wood use, resource circulation of plastic and metal resources, and recycling of used diapers—; and efforts for establishing sustainable agriculture, forestry, fisheries industries in harmony with the environment as industries in communities.

(Realization of nature-positive through the use of the local natural capital)

Regarding nature-positive, Japan will take measures for encouraging the private and other sectors to promote voluntary efforts, including certifying such efforts under the Nationally Certified Sustainably Managed Natural Sites program, thereby simultaneously achieving the conservation of natural capital in communities and the revitalization of communities. In addition, Japan will facilitate the appropriate management of forests and sustainable use of forest resources to realize green growth of the forest and forestry industry and the wood industry and also will advance efforts toward the 30by30 target in terms of the sea, conduct the "satoumi" creation initiative aiming for a virtuous circulation between the promotion of the conservation, restoration, and creation of tidal flats, algae seaweed beds, and sea grass beds, which is an effort with high expectations for blue carbon, and the utilization of such tidal flats, etc. as resources in communities, and create a good environment, thereby realizing simultaneous solutions to challenges that communities face, including improving the well-being of community residents and the revitalization of communities. Moreover, it will deploy the Project to Fully Enjoy National Parks in all 34 national parks so as to achieve a virtuous circulation between promoting the use of national parks and protecting rich natural capital in the parks.

(2) Improvement of intangible assets (e.g., human capital and communities) that support a Circular and Ecological Economy

In order to achieve a virtuous circulation of economy in communities and simultaneous solutions to both the environmental challenges and socio-economic challenges in communities, it is important to expand and improve investment in intangible assets, e.g., human resources and communities that play a leading role in circulation and solutions. Regarding the maximum use of the existing intangible assets that meet the needs of each community as a premise, we will describe support measures as below.

(Maintenance and revitalization of inter-community networks utilizing culture and sports unique to communities)

In the process of constructing a Circular and Ecological Economy, the building of relationships

of mutual support among communities and the creation of a decentralized network should serve as a driver to encourage the maintenance and revitalization of communities. Considering the fact that cultures and sports deeply rooted in communities have the power to encourage people in communities to participate in efforts, we consider it important to have a viewpoint that people in communities can be motivated to unite their efforts to build an inter-community network by taking advantage of such culture and sports. Japan will conduct a survey for the case examples of good inter-community networks, convey such examples to the public, and provide communities with opportunities for networking, i.e., promoting the establishment of networks. Through these efforts, it will strengthen the system that supports the construction of the Circular and Ecological Economy.

(Enhancement of intermediary support organizations, etc., that play a leading role in creating a Circular and Ecological Economy)

Japan will enhance the feasibility of simultaneous solutions to the environmental issues and the challenges that communities face by providing a program in which human resources having intermediary supporting functions ascertain the essential needs of communities and provide them with mentoring support for implementing initiatives, including starting business, and this is expected to stimulate the further development of efforts. The existing intermediary support organizations will provide practical support to communities and, at the same time, will convey know-how on mentoring support to other organizations, and through these efforts, they will foster human resources and organizations that play a leading role in working as an intermediary supporting function.

With regard to decarbonization in communities, in particular, Japan will ascertain the operation of the system for dispatching advisors build decarbonized communities, which started in FY2023, and the needs of municipalities and other communities for support in decarbonization, and hold discussions on roles and functions expected from the existing organizations, e.g., Regional Environment Offices, prefectures, and the Center for Climate Change Action, and based on this, it will hold discussions on the establishment of an intermediary support system that can provide comprehensive support to multiple municipalities and other communities thoroughly ranging from preparing a plan on building a decarbonized community to providing support in implementing the plan.

(Development of environmental human resources in communities)

Japan should develop key human resources in order to promote community-led decarbonization that contributes to the communities. To this end, it will provide a program for human resource

development consisting of some stages tailored to the achievement level of the performance and efforts required from the key human resources for decarbonization and conduct networking among such resources and between the resources and companies undertaking the collaboration with communities for decarbonization in the communities. Through these efforts, Japan will advance the establishment of a collaboration framework for decarbonization in communities.

(3) Further greening efforts by regional financial institutions and regional SMEs

We explained the importance of greening efforts in ESG finance and corporate behavior in Item 1 "Establishment of a green economic system that realizes sustainable production and consumption as an effort leading to 'new avenues for growth'" above. It is considered indispensable to enhance and accelerate these efforts at the community level as well in order to build a Circular and Ecological Economy.

(Further introduction of ESG in regional finance)

ESG finance initiatives by regional financial institutions to create environmental and social impact and improve regional sustainability are considered to lead to the construction of a Circular and Ecological Economy, which will also contribute to the realization of "new avenues for growth." Based on this idea, regional financial institutions, jointly with municipalities, should finance and support business that has the potential to link knowledge on the utilization of local resources or solutions to challenges that communities face with economic value and should synchronize economic vitalization and the solutions to the challenges that communities face. In other words, regional financial institutions should put "ESG regional finance" into practice.

We have been conducting the "ESG Regional Finance Promotion Program" since FY2022 as well as other initiatives. Under the program, regional financial institutions have been raising awareness and advancing efforts involving ESG regional finance, mainly in the fields of decarbonization and SDGs, and have made a certain degree of progress to date. However, amid the expansion of environmental challenges to be addressed, e.g., securing biodiversity and creating a sound material-cycle society, such institutions have been undertaking more complex measures to simultaneously solve the challenges that communities face and the environmental challenges. Moreover, amid the expansion and dissemination of sustainable finance, including ESG finance, both in Japan and overseas, the institutions are expected to address environmental challenges in a more full-fledged manner, in which the entire value chain, including regional SMEs, are involved.

In light of these circumstances, Japan will provide, as it did in the past, support to regional financial institutions in conducting ESG regional finance and also support the efforts by such financial institutions to address more advanced and broader environmental challenges. Moreover, it will promote measures to encourage regional financial institutions to collaborate with stakeholders (e.g., regional companies and municipalities), which are important partners for such financial institutions in further putting ESG regional finance into practice. Furthermore, Japan will work with the Japan Green Investment Corp. for Carbon Neutrality (JICN) and support certain efforts, including the establishment of and investment in regional energy companies and decarbonization funds by regional financial institutions and the establishment of loan programs focusing on decarbonization.

(Support for regional energy companies and regional SMEs that play a leading role of creating the Circular and Ecological Economy)

Regional energy companies that work with local governments are expected to play a leading role of creating a Circular and Ecological Economy in which people make use of regional resources, e.g., renewable energy, and contribute to revitalizing regional economies and solving regional issues. Such companies are also anticipated to support not only regional SMEs in advancing their decarbonization but also regional industries in strengthening their competitiveness. Japan will support these regional energy companies in introducing renewable energy, energy conservation, and energy storage that contribute to communities in a way that these companies build consensus with the communities and give appropriate environmental considerations. As an effort to achieve a net-zero society, Japan considers it important to promote decarbonization in SMEs, which are elements making up value chains, a strong point of the industrial competitiveness of Japan. To this end, it will establish a region-wide support system in which regional financial institutions, chambers of commerce and industry and other economic organizations, and local governments, which all usually have relationships with SMEs, jointly support SMEs' decarbonization, and at the same time, it will encourage SMEs to take the steps of "learning," "accounting," and "reducing"[150] toward decarbonization. Japan will also make use of the Energy Efficiency and Global Warming Countermeasures Online Reporting System (EEGS) and other tools to develop an environment in which SMEs, including those not required to report their emissions, can easily calculate and disclose their emissions, thereby supporting SMEs in setting reduction targets, formulating plans, and investing in

[150] In order to promote decarbonization throughout the supply chain, it is important to establish a region-wide support system in which diverse SMEs can tackle "learning (motivation for action)," "calculating (emission calculation)," and "reducing (reduction targets, planning, and investment in decarbonization facilities)" in accordance with their needs.

decarbonization facilities.

(4) Just transition through the approach of creating a Circular and Ecological Economy

In the process for transitioning communities from the conventional ideal state to a sustainable state, Japan will focus on a "just transition," a concept of ensuring that no one or community is left behind in the transition process as far as possible. From this viewpoint, it will conduct the following efforts.

(Building of regional platforms to ensure that no one is left behind in the transition)
In the process of realizing a Circular and Ecological Economy, Japan will target regions undergoing dramatic changes in their socio-economic structures, and, based on the concept of a Circular and Ecological Economy, including a collaborative approach, it will build regional platforms to minimize the negative effects of changes in socio-economic structures and create initiatives including new industries placing the environment at the core and will also support community-led efforts, e.g., sharing visions and business concepts, and establishing new businesses.

(5) Restoration of lost environmental restoration and revitalization of communities

We are now facing a serious environmental crisis, and in some regions, the relationship between nature and people has been broken up due to pollution and disasters. Before ending the explanation of the priority strategy in this section, we would like to introduce two case examples as efforts showing the difficulty in restoration of the environment once lost, communities struggling to achieve revitalization by exercising their creativity and ingenuity, and the importance of intangible assets, e.g., human resources and communities in the process of such restoration.

(*Moyai-naoshi* (rebonding) in Minamata)
Although Minamata disease was officially recognized in 1956, people in the affected areas continued to face a variety of problems, ranging from environmental pollution to the issue of relief for victims, to prejudice, and to discrimination. Under those circumstances, Kumamoto Prefecture and Minamata City jointly deployed a "Minamata Environmental Regeneration Project" from 1990 to 1998 with the aim of revitalizing local ties and raising public awareness of environmental issues toward the restoration of Minamata. In 1992, Minamata City declared an "Eco-Model City Development" ahead of other cities in Japan, and since then, the entire

community of the city has been promoting various environmental activities, including advanced separation and recycling of waste. Backed by these activities, Minamata City was approved by the national government as an Eco Town in 2001, as an Environmental Model City in 2008, and as an SDGs Future City in 2020. Moreover, the "Policy for the Act on Special Measures Concerning the Compensation of Minamata Disease" (cabinet decision on April 16, 2010) stated that "Japan will proactively promote the creation of new forms of regional development that will achieve economic growth while minimizing environmental loads, including ecotourism, by making full use of the high level of public environmental awareness, accumulated environmental industrial technology, beautiful natural environment, and abundant local resources." Based on this policy, the national government, Kumamoto Prefecture, Minamata City, and other organizations jointly launched the "Environmental Capital City Minamata Project" in 2012, and since then, they have been proactively working to build a sustainable community placing the environment at the core. At the same time, Japan has been proactively implementing international cooperation in the environmental field. Since 2000, JICA has been accepting trainees from Asian countries and providing them with training based on the experiences and lessons learned from Minamata disease. In 2013, the preparatory meeting for the Conference of Plenipotentiaries on the Minamata Convention on Mercury was held in Kumamoto City and Minamata City, and the participating countries adopted the Minamata Convention on Mercury, which aims to protect human health and the environment from human-caused emissions of mercury and other substances.

"*Moyai-naoshi,*" or rebonding of communities in the areas affected by Minamata disease, suggests to us today the importance of environmental regeneration and reconstruction in communities, the realization of "well-being/quality of life" following the regeneration and reconstruction, and "participation" of people in the process of achieving these goals as well as the significance of the role played by communities as the foundation of the regional areas. Bearing this in mind, Japan will continue to support the realization of a Circular and Ecological Economy in the areas affected by Minamata disease, and use it as a reference for other areas.

(Future-oriented efforts in Fukushima)

As Fukushima Prefecture has been advancing efforts for recovering from the damage caused by the Great East Japan Earthquake and the subsequent accidents at TEPCO's Fukushima Daiichi Nuclear Power Station, Japan will vigorously promote future-oriented efforts in the prefecture to create and rediscover regional strengths from an environmental perspective in response to the needs of the communities. Japan will focus on the field of the "energy, environment, and recycling" as part of the Fukushima Innovation Coast Framework, promote initiatives related to

industry-government-academia collaboration and technological development of advanced recycling technologies, support the creation of industries, and, from the standpoint of people and cities involved in reconstruction and revitalization, conduct research that contributes to the introduction of renewable energy and further acceleration of technological development, thereby supporting community efforts taken under the "Decarbonization x Reconstruction" Town Planning" In addition, working with Fukushima Prefecture, the government will aim to promote the appropriate use of the natural environment in harmony with its conservation so as to enhance the proportion of the population that interact both domestically and internationally in accordance with the "Fukushima Green Reconstruction Project."

4. Realization of safe, secure, healthy, and fulfilling everyday lives that allow people to realize "well-being/quality of life"

(Basic concept)

Protecting people's lives requires the maintenance of natural capital, which is the foundation of the environment, at least at the "level where hindrances to environmental conservation are prevented." However, we are still facing many problems that need to be addressed, including the following: environmental pollution of water, air, and soil, e.g., by chemicals and microplastics; health effects caused by various factors in the environment, e.g., pollen; heat illness caused by the deterioration of the heat environment derived from climate change and the heat island effect; chemicals spills caused by wind and flood damage that are becoming more and more severe due to climate change; and the degradation of ecosystems and living environments caused by the expansion of invasive alien species and the increase in the number of sika deer, wild boars, and other animals. Japan should continue to focus on "fundamental efforts to protect human lives and the environment," which is the unchanging origin of environmental politics, and should maintain biocapacity by keeping a sufficient margin from the critical level of biocapacity by advancing the reduction of total environmental loads. In addition, it should also focus on extremely serious environmental impacts expected to occur based on the appropriate assessment and management of environmental risks as well as on scientific findings and it should promote efforts for protecting people's health and the conservation of their living environment by taking prevention measures against such impacts while striving to enhance scientific findings.

In order to realize "well-being/quality of life," it is important not only to steadily prevent such hindrances to environmental conservation but also to pursue "the level of creation of a good environment" following the prevention. It is also important to enhance natural capital as stock

as well as capital and systems that maintain, restore and enhance natural capital as an approach to realizing "well-being/quality of life," including non-market values e.g., health and welfare, education, community and culture, and a society in which people live in harmony with wild animals. Specifically, taking advantage of nature and cultures unique to communities, e.g., rich watersides, starry skies, and soundscapes, which are elements synergetic with environmental efforts e.g., for community building and nature conservation, Japan should promote the creation of a good environment as a foundation for healthy and affluent living. In advancing this process, we consider that the concept of "Nature-based Solutions (NbS)" is effective.

Along with the development of the environment described above, we should, in our lifestyles and work styles, including consumption behavior, proactively choose products and services with higher environmental value (lower environmental loads) and develop more green products and services by appropriately evaluating environmental value, rather than focusing on price, thereby creating a virtuous circulation that generates new demand. For example, against the backdrop of increasing demand for food safety and growing awareness of environmental issues, producers and consumers fully began to connect and build a face-to-face relationship in the 1970s, which is called "direct delivery from the farm." In addition, Japan should effectively make use of its limited resources to reduce environmental loads derived from using and processing natural resources. We can achieve this by conducting the following efforts, for example: developing products and transportation as a service; the sharing economy; the provision of subscription services; and the maintenance of economic value of existing products by reusing, repairing, refurbishing, remanufacturing such products, as seen in efforts for not disposing but upcycling, relocating, and restoring old private houses and protecting existing resources and culture. Through these efforts, Japan should show an ideal approach to lifestyles based on sustainable consumption, e.g., sustainable and healthy eating habits and sustainable fashion, i.e., realizing the "well-being/quality of life," as an alternative method to the current mass production, mass consumption, and mass disposal of products.

Japanese culture is based on harmony with nature, nurturing Japanese sensibility through long-term interaction with nature. Traditional arts and a sophisticated manufacturing culture have emerged. However, due to dependence on overseas resources, rapid urbanization, population decline and the aging of society, connections between people and nature and those among people are being diluted, and traditional communities are being lost. In promoting the development of sustainable communities that take advantage of nature unique to communities and the cultures and industries that sustain the communities, we should reaffirm the value of nature in communities and promote the rebuilding of the ties between people and nature, the

restoration of humanity and sensitivity, the promotion of health, and the sound growth of children.

(1) Fundamental efforts to protect human lives and the environment

Bearing in mind the problem awareness as we stated at the beginning of this Plan, namely "Humanity is facing a serious environmental crisis. Human activities have been going beyond the biocapacity of the earth and the planetary boundary, and this has been threatening the stability of the limited environment or natural capital that is the basis of our survival," it is indispensable for us, once again, to steadily implement "fundamental efforts to protect human lives and the environment," which is the unchanging origin of environmental politics.

Climate change causes a wide variety of impacts on human health, including the following: health hazards caused by the heat environment, e.g., heat illness; human casualties in natural disasters, e.g., torrential rains; changes in the prevalence patterns of waterborne and foodborne infectious diseases; changes in the endemic areas of arthropod-borne diseases; and mental health problems due to disasters. In addition, the "Workshop Report on Biodiversity and Pandemics" published by IPBES points out that more than 30% of emerging infectious diseases are caused by deforestation, human habitation of wildlife habitats, and other factors. In addition, the report shows concern over the impacts on health and ecosystems associated with environmental pollution caused by harmful chemicals and microplastics. As seen above, the "health of the earth" and the "health of people" are interrelated, and it is necessary to address global environmental issues from the perspective of "Planetary Health," which considers the two as an integral part of one another.

(Steady implementation of environmental conservation of water, air, and soil)

The water, air, and soil environments, which are the basis for the survival of humankind, should meet the environmental quality standards and continuously be improved. To this end, Japan will continue to steadily implement measures under related laws and regulations, including the Air Pollution Control Act (Act No. 97 of 1968), the Water Pollution Prevention Act (Act No. 138 of 1970), and the Soil Contamination Countermeasures Act (Act No. 53 of 2002) and other related laws and regulations. Steady implementation of measures based on the "Water Pollution Control Law" (Act No. 138 of 1970), "Soil Contamination Countermeasures Law" (Act No. 53 of 2002). In addition, it will reflect the latest scientific findings in the policies for the conservation of water, air, and soil, thereby improving the safety and security of citizens. For specific efforts, see Chapter 3 "Development of priority measures in individual fields" below.

(Promotion of measures against heat illness)

The heat island effect, in addition to climate change, is feared to cause a further increase in temperatures, in particular, in cities, and this is raising concerns about the impact on people's lives, e.g., increased risk of heat illness and lower quality of sleep. Japan will facilitate adaptation measures, including the reduction of anthropogenic heat, improvement of ground surface cover, and measures against heat illness.

(Promotion of measures against marine litter)

Japan will focus on marine litter, including plastics, and will protect coastal landscapes and the marine environment by promoting the following efforts: ascertaining, collecting, and treating marine debris through collaboration among various stakeholders under the provisions of the Act on Promoting the Treatment of Marine Debris Affecting the Conservation of Good Coastal Landscapes and Environments as well as Marine Environments to Protect Natural Beauty and Variety (Act No. 82 of 2009; hereinafter referred to as the "Act on Promoting the Treatment of Marine Debris"); measures for curbing the generation of plastics under the related laws and regulations, including the Plastic Resource Circulation Act (Act No. 60 of 2021); accumulating scientific findings on the impacts of microplastics on living organisms and ecosystems; and international collaboration through international frameworks, and multilateral and bilateral cooperation.

(Enhancement of measures against wildlife)

Japan will focus on sika deer and wild boars, which cause serious damage to ecosystems and the agriculture and forestry industries. Aiming to halve the population of such wildlife by FY2028 from the FY 2011 level, the relevant ministries and agencies will cooperate to implement intensive measures for hunting sika deer and to train highly-skilled hunting experts. In addition, aiming to prevent human injuries caused by bears, Japan will conduct the following necessary measures: enhancing the separation of people's residential areas from the habitats of bears; establishing a system for addressing bears appearing in urban areas; preserving the populations of bears in communities based on scientific findings from surveys and monitoring; and strengthening the control of bear individuals that may cause harm to people. Furthermore, with regard to infectious diseases related to wildlife that affect human health, socio-economic activities, and biodiversity conservation, Japan will conduct risk assessment on biodiversity conservation and establish a liaison system to find the occurrence of infectious diseases at an early stage and respond promptly based also on the perspective of the one-health approach.

(Promotion of measures against invasive alien species)

Japan should promote comprehensive measures against alien species, including the new designation of invasive alien species, regulations over importing and raising, public awareness, and implementation of control projects. To do them, in light of the IPBES Summary for Policymakers (SPM) of the Thematic Assessment Report on Invasive Alien Species and their Control, Japan will encourage various stakeholders, including the business sector, to engage in related efforts through the revision of the "Invasive Alien Species Management Action Plan" and other policies and will strengthen systems and international cooperation for preventing invasions of and responding early to invasive alien species that are potentially the most cost-effective options. In particular, fire ants which are regulated as "Designated Invasive Alien Species Requiring Urgent Action" under the Revised Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Alien Species, for their potentially serious impact on the human body and the disruption of the safety and security of citizens' lives, so the government will conduct thorough border measures to prevent their establishment of fire ants in Japan.

(Measures against chemicals based on the concept of "Planetary Health")

Measures against chemicals should place weight on the concept of "Global Framework on Chemicals - For a Planet Free of Harm from Chemicals and Waste," a new framework for chemicals management that is also consistent with the concept of "Planetary Health." Based on this concept, Japan will steadily promote specific measures as described below in Chapter 3 "Development of priority measures in individual fields."

(Promotion of sustainable management of nitrogen and phosphorus)

It is required to establish systems and implement actions for the comprehensive management of nitrogen material flow with the balance of its inputs and outputs as reactive nitrogen that exists across various media, such as water, soil, and air. Nitrogen is an essential substance for food production and industrial production; however, it may deteriorate various environmental media in the form of air pollution, eutrophication of water bodies and groundwater contamination. Moreover, Japan imports almost all the raw materials for major chemical fertilizers, facing challenges not only to the stable supply of fertilizers, but also to its economic and food security.

The UN Environment Assembly's resolution on sustainable nitrogen management states that excessive levels of nutrients, in particular, nitrogen and phosphorus, have a significant impact on water, soil, air, biodiversity and ecosystem functioning, and encouraged Member States to accelerate actions to significantly reduce nitrogen waste globally by 2030, and to share

information on national action plans. Additionally, a working group was established and discussions were facilitated on an intergovernmental coordination mechanism for nitrogen management policies.

Therefore, Japan will promote sustainable nitrogen and phosphorus management that contributes to societies and regions by taking an integrated approach to conservation and management of the water and atmospheric environment, decarbonization, resource circulation and symbiosis with nature. Specifically, Japan will take measures to address nitrate nitrogen and nitrite nitrogen in groundwater, which continue to exceed environmental standards, and eutrophication in lakes, which also serve as sources of drinking water, through proper fertilizer application, expansion of the use of compost and fertilizer made from sewage sludge resources, energy use of livestock manure and sewage sludge resources. In addition, in the development/use of ammonia for fuel, hydrogen carriers, and other applications that are expected to expand in the future, Japan will facilitate the avoidance of NOx and N2O emissions by utilizing technologies that do not increase NOx emissions. Furthermore, Japan will promote proper nutrient management to achieve a "Clean and Rich Sea" through the active operation and management of sewage treatment plants.

Japan will also continue to elaborate the nitrogen inventory and consolidate scientific knowledge while contributing to international nitrogen management by sharing Japan's experience with Asian developing countries, where nitrogen consumption is increasing rapidly.

(2) Creation of a good environment for fulfilling everyday lives

In order to realize "well-being/quality of life," it is important not only to steadily prevent hindrances to environmental conservation mentioned above but also to pursue "the level of creation of a good environment" following the prevention. We will explain measures for enhancing natural capital as stock and capital and systems that maintain, restore and enhance natural capital so as to realize "well-being/quality of life."

(Realization of a "virtuous cycle of protection and use" by the creation of a good environment that also utilizes OECM)

We consider it important to focus on the following approach: Japan should create a "good environment" by improving the value of the environment and aim to build a state in which the interaction between a good environment and people improves people's well-being and brings about full vitality to both individuals and communities.

To achieve this creation of a good environment, Japan will undertake the following efforts: conserving nature and culture unique to communities, e.g., rich watersides, starry skies, and soundscapes, to improve the well-being of community residents and vitalize communities; aiming for a comprehensive management of the water environment that contributes not only to water quality management but also to the conservation of biodiversity and the building of communities; developing a model of integrated watershed conservation that links communities that work on the creation of a good environment also taking advantage of OECM, ranging from the forests and rivers that serve as water sources to the sea; and "satoumi" creation, a project for developing a virtuous circulation between the promotion of conservation, restoration, and creation of tidal flats and seaweed beds, and grass beds and the utilization thereof as local resources.

(Promotion of wildlife conservation and management)

Japan will support and promote community activities related to wildlife conservation as well as encourage various stakeholders, including the business sector, to participate in such activities in coordination with the efforts under the Nationally Certified Sustainably Managed Natural Sites program.

In addition, it will promote efforts to create communities in harmony with nature, including the preservation of habitats and growth environments of iconic rare species and the conservation of rare species in *satochi-satoyama*, which used to be familiar to people, thereby contributing to the reconstruction of communities and societies and the realization of fulfilling everyday lives for people.

(Appropriate promotion of animal welfare and management)

The appropriate care of pets is an important form of symbiosis between people and living organisms. Pets often provide people with fulfilling everyday lives, while a variety of animals other than pets, e.g., those used for food and scientific purposes, support "well-being/quality of life." However, as people have a wide variety of views on animals, we need to manage pets and other animals appropriately. Against this background, the government will comprehensively promote measures to promote the proper handling of animals with the aim of realizing a society in which people and animals live in harmony.

(Revitalization of hot spring areas)

Hot spring resorts have long played a central role in promoting community health, economy, and society, and have the potential to offer a variety of values even in our diversified lifestyles

today. For this reason, Japan will promote "ONSEN stay," a new way of spending time in hot spring resorts that allows visitors to proactively enjoy the surrounding nature, history, culture, food, and other local resources, in addition to the traditional use of bathing, to interact with people in communities and other visitors, and to refresh themselves both mentally and physically, thereby contributing to the realization of people's healthy and fulfilling everyday lives and the revitalization of hot spring resorts.

(3) Lifestyle transformation for fulfilling everyday lives

An approach to realizing "well-being/quality of life" requires the shift of our current lifestyle and work style, including consumption behavior, away from the value of "mass production, mass consumption and mass disposal as the key to affluence," to the value focusing on the quality of living, e.g., environmental value, not on product prices. In addition, promoting symbiosis between people and nature is also considered important.

(Visualization of greenhouse gas emissions by product)

"Carbon footprint" or CFP is an approach to making greenhouse gas emissions "visible" and this is an effective method to provide consumers with the information they need in choosing green products and services that contribute to the realization of decarbonization and low carbon emissions. In this context, Japan will encourage industries to make industry-based common rules for labelling CFP by type of products and will also develop a framework for CFP certification under a certain uniform standard. In addition, it will demonstrate an effective CFP labeling method that utilizes actions based on nudge theory or nudge actions as well, and stimulate consumers to change their consumption behavior by advancing the "DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization)" campaign so as to further disseminate CFP and encourage consumers to choose green products and services that contribute to the realization of decarbonization.

Japan also considers it essential to visualize the effect of reduction of environmental loads, e.g., CO_2 reduction, from products, and shift the value of products to added value. In this process, industries may provide green products by utilizing the mass balance method as an effective effort. However, this concept involves some challenges, e.g., lower social recognition and lack of uniform rules in markets compared to CFP. To address this, Japan will study the possibility of promoting this concept.

(Social implementation of products, services, etc. that support "newly prosperous

lifestyles")

Based on the "10-year roadmap of lifestyles" (formulated in FY2023) as well, Japan will support and deploy projects for advancing the effective and efficient social implementation of products and services that support "newly prosperous lifestyles" in all areas of people's lives (e.g., food, clothing, housing, work, transportation, and shopping), including not only decarbonization but also resource circulation and nature-positive. Through these projects, Japan will encourage people to change their consumption behavior and lifestyles and help them to realize more fulfilling everyday lives.

(Promotion of changes in lifestyles by reducing food loss and waste)

Food loss and waste in Japan is 5.23 million tons (estimated by the Ministry of Agriculture, Forestry and Fisheries and the Ministry of the Environment in FY2021), which is 1.1 times the amount of food aid provided by the World Food Programme (WFP) (4.8 million tons per year in 2022), an organization supporting people suffering from hunger worldwide. Meanwhile, we have been emitting a large amount of greenhouse gases from the food system, ranging from procurement to production to processing to distribution and consumption as well as disposal. As such, reducing food loss and waste is an urgent issue for Japan from the perspective of the effective use of resources and the reduction of environmental loads.

Based on this problem awareness, the government will stimulate concrete efforts for reducing food loss and waste, e.g., establishing some zero-food-loss areas and deploying the mottECO program that encourages consumers to take their leftover food home from restaurants. At the same time, the relevant ministries and agencies will unite their efforts to address this issue, e.g., conducting surveys on the current status and research for effective reduction methods, collecting and providing information on leading efforts, and supporting food bank activities.

As reducing food loss and waste requires supply chains as a whole to work together, it is indispensable for encouraging stakeholders to raise awareness of the reduction of food loss and waste and to change their behavior for the reduction. To propel this approach, a variety of stakeholders, including local governments, businesses, and consumers, should work together to raise national momentum for reducing food loss and waste.

(Promotion of sustainable fashion)

It is estimated that the total amount of CO_2 emitted from the procurement of materials to the disposal of clothing distributed in Japan and abroad is about 95 million tons, of which about 9.7 million tons are emitted from Japan. This amount of CO_2 emissions is equivalent to about 0.8%

of the total emissions in Japan. In addition to CO_2 emissions, the total amount of water consumed in Japan and abroad during the production of clothing supplied to Japan is estimated to be 8.4 billion m^3, and the total amount of scrap and other materials discharged is 45,000 tons. Therefore, shifting the process involving clothing, ranging from production, wearing, and disposal from "mass production, mass consumption, and mass disposal" to a process sustainable for the future is an indispensable initiative for the reduction of total environmental loads.

Based on this problem awareness, the government will advance the following efforts: supporting the development of technologies to identify clothing emissions, and sort and recycle clothing in a cutting-edge manner; discussing ways to promote the Design for Environment (DfE) approach; and developing a concrete framework for the effective labeling of sustainable and other green products, as well as promote efforts for information conveyance to consumers to encourage them to change their consumption behavior. In addition, working with the industrial sector, the government will take actions to realize "sustainable fashion," including shifting to the production and purchase of appropriate quantities, extending product life cycles, e.g., by repairing, and taking necessary measures to establish a resource circulation system involving collection, separation, design and manufacturing, and sales of products for their appropriate reuse and recycling.

(Promotion of people's interaction with nature)

In an increasingly digitalized society, Japan will focus on the benefits of physical experiences of nature, including effects brought by forests to people (e.g., health improvement, growth of healthy children, society-wide prevention against loneliness and isolation of people, change in values and lifestyles of people), and will encourage people to interact with nature. As part of this, it will promote the following initiatives: providing people with more opportunities to experience rich nature, e.g., by conducting experience-based nature activities for children and by developing contents for nature experience, e.g., in national parks, and disseminating information thereof; developing nature interpreters and other human resources to improve the quality of stay experiences of visitors; developing, upgrading, and improving facilities in nature parks and other areas as a base that visitors can use in a safe and comfortable manner, and promoting the use of long trails in such parks.

(Promotion of voluntary change in behavior by using nudge actions)

In general, environmental considerations tend to be postponed because the results of actions are not immediately visible, and people often think that environmental issues have nothing to do with them or that they are not concerned about them. Although there have been attempts to

improve such cognitive bias and indifference through publicity, awareness-raising, and environmental education, some issues are still seen in the quality and effectiveness of such attempts, as many point out.

In light of this situation, we will take evidence-based scientific approaches with proven effectiveness, e.g., using nudge actions and other behavioral science findings, to improve biases and habits of thinking about various environmental issues, make environmental issues a personal matter, and promote voluntary changes in awareness and behavior.

(Promotion of a lifestyle incorporating a phase free approach)

"Phase free" is an approach in which products and services around us are designed to be useful not only in normal times but also in the event of emergencies, and this approach offers us important suggestions useful in incorporating environmental considerations into our everyday lives. Japan will strive to propose new lifestyles that incorporate a "phase-free" approach in the following efforts, for example, to advance the shift of society: promoting the introduction of electric buses that can be used as batteries in times of disaster; developing facilities equipped with renewable energy facilities that can reduce CO_2 emissions during normal times and become an independent energy source in the event of emergencies; and developing disaster prevention parks that contribute to the conservation of biodiversity and the realization of "well-being/quality of life" for citizens during normal times. Through these efforts, Japan will improve the quality of people's everyday lives and, at the same time, lead the results of such efforts to simultaneous solutions to various social issues, e.g., environmental considerations, disaster risk reduction, and climate change adaptation.

(Effective sharing of scientific findings with citizens)

As mentioned in Part 1 of the Plan, the event attribution method has become a clue for scientifically and quantitatively evaluating the fact that extreme weather events, e.g., extreme high temperatures and heavy rainfall, are the results of serious impacts caused by global warming. Meanwhile, the public has widely been aware of the recent abnormal weather conditions but lacks awareness of the fact that such abnormal conditions have been caused by global warming or that they need to take measures for shifting their individual lifestyles and industrial structures, uncovering a situation in which the fact of abnormal weather conditions does not necessarily directly raise public awareness of or drive actions towards decarbonization. To address this, in parallel with advancing the DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization) campaign, the government and other stakeholders will facilitate the conveyance of information on scientific findings, which are a

prerequisite for the campaign. Moreover, it will effectively share information with the public on the best available scientific findings about the conservation of biodiversity, the realization of a circular economy, and other actions, in addition to the information on global warming, e.g., by establishing a platform of experts and other stakeholders, so that Japan can encourage the public to change their behavior.

(Creation of new demand for wood and further fostering of consumers' understanding of wood)

Under the "Act on Promotion of Utilization of Wood in Buildings to Contribute to the Realization of a Decarbonization Society" (Act No. 36 of 2010) and other laws and regulations, Japan will promote the following efforts: using wood or introducing lignification in public buildings, non-residential buildings, and mid- and high-rise buildings in cities and regional areas, which are expected to contribute to creating comfortable living spaces, "visualizing" the effects of these efforts, and disseminating the evaluation method; developing and disseminating technologies involving material wood, CLT, and fire-resistant members for lignification; expanding the use of wood in furniture, toys, daily necessities; and developing and demonstrating new materials for lignification, e.g., cellulose nanofiber and modified lignin. In addition, Japan will encourage activities to foster public momentum for promoting the use of wood, e.g., a national campaign for wood use promotion, named "*Kizukai*," and "wood education."

5. Development, demonstration, and social implementation of science, technology, and innovation to support "new avenues for growth"

(Basic concept)

In the fields of science, technology, and innovation, which bolster our future, fierce competition for advanced technology has been intensifying between countries, in particular, between the U.S. and China. Amid this, major countries are moving toward greater investment in science, technology, and innovation. In addition, the competition between countries has been expanding to include the acquisition and development of human capital, which is the source of knowledge and value creation.

Japan has high investment in R&D, patents, and other innovative property, but low investment in economic competencies after ascertaining the essential needs of citizens, e.g., marketing and branding, resulting in a low realization rate of innovation. In contrast, European countries invest more in economic competencies and have a higher realization rate of innovation.

Science, technology, and innovation are the driving forces that shift the solutions to social issues, including climate change, to a source of growth and realize sustainable economic growth. At the same time, they work as a national lifeline as they ensure the safety and security of citizens against threats, e.g., infectious diseases and natural disasters.

In order to realize "well-being/quality of life," economic growth, and other goals, we should make use of Japan's uniqueness, e.g., its traditional view of nature described in Item 4 above, and, at the same time, ascertain biocapacity, which global society needs, and the demands of consumers in their everyday lives in Japan and its communities.[151] Based on this, we should realize the following: technological breakthroughs led by the essential needs of citizens now and in the future; reform of systems, lifestyles, and institutions; broad-based innovation[152] of socio-economic systems, technologies, lifestyles, and other elements brought about by institutional innovation, e.g., by mobilizing human resources and funds; and creation of new value using ingenuity and creativity.

In parallel with this, Japan should focus on science, technology, and green innovation, which may become a source of solutions to environmental issues and a source of growth, encourage markets and people as consumers, which may have impacts on the decisions that the government and companies make, to understand, assess, and utilize science, technology, and green innovation, and, to this end, it needs to make efforts to raise public awareness and help people change their behavior. In advancing these efforts, the government and companies, together with markets, should serve as a key player that executes an important role in moving the country down the path of green innovation. Based on this, aiming to draw out the power of independent citizens and civil society and link it to behavioral change, we will promote the use of data-driven AI, IoT, and other informational means, as well as foster social value that places importance on solutions to environmental issues.

In promoting environmental policies based on scientific findings, the creation and accumulation of scientific findings and the development of basic information are also indispensable. In this context, Japan will promote environmental research in which Japan ascertains the global environmental situation and contributes to the international community and basic research that

[151] This approach includes the following questions, for example: "What is the source of vitality in Japan, which is facing a declining population?" "What kind of technology is needed to maintain the sustainability in community livelihoods and Japanese industry?" and "What are the bottlenecks in building a socio-economic system within the limits of biocapacity in Japan and worldwide?"

[152] This includes innovation brought about by the combination of existing technologies.

contributes to the development of science and technology and solutions to environmental issues. It also considers it important to advance the research and development of technologies for monitoring, traceability and forecasting used as the basis for policy making. Moreover, aiming to support these efforts, tackling basic efforts is necessary as well, including the fostering of human capital.[153]

In addition to these basic efforts, Japan should place importance on developing and demonstrating cutting-edge environmental and other technologies and implementing the outcomes in society. To this end, it will promote research and development and advance social implementation of the technologies for the following purposes, for example: achieving sustainable production and consumption by building a green economic system; addressing climate change; accelerating the development of a circular economy and nature-positive; creating a good environment; ensuring the safety and security for supporting people's healthy and fulfilling lives; achieving a low impact environment ("environment/life technologies") by making use of biomimicry, i.e., technology that mimics the excellent shapes and functions of biological and ecological systems.

Moreover, leveraging intellectual property, one of Japan's competitive advantages, we will foster startups in the environmental field as a leading player of innovation. In doing so, it is important to develop measures while keeping in mind that innovation does not always move in the direction of greening, and that technologies other than those for environmental purposes need to be developed in a way that protects biocapacity and contributes to solving environmental problems.

(1) Creation of demand by raising public awareness and promoting behavioral change to understand, appreciate, and utilize green innovation

It is important for citizens to understand, evaluate, and utilize low impact environmental technologies and green innovation, and for this purpose, Japan should work on the following: stimulating and creating initial demand for cutting-edge decarbonized products and technologies throughout Japan, as described in Item 1"Establishment of a green economic system that realizes sustainable production and consumption as an effort leading to 'new avenues for growth'"; and encouraging a shift in terms of our lifestyles and work styles, including our consumption behavior, from the value of "mass production, mass consumption and mass disposal as the key to affluence," namely a shift to the way focusing on quality, such as

[153] An integrated perspective that transcends the boundaries of the humanities, social sciences, natural sciences, etc. is necessary.

environmental value, not on price, as described in Item 4 "Realization of safe, secure, healthy, and fulfilling everyday lives that allow people to realize 'well-being/quality of life'" above.

(Creation of demand and shifting of value)

In accordance with the National Government Action Plan and the Act on Promoting Green Procurement, the government will take the lead in utilizing state-of-the-art decarbonized products and technologies to propel social implementation thereof and encourage consumers to change their awareness and behavior by leveraging "DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization)."

(Promotion of third-party evaluation and information disclosure so that end users can use advanced environmental technologies with peace of mind)

In addition to the efforts mentioned above, the evaluation and demonstration by third parties of advanced environmental technologies that are developed by private companies, including startups, are considered important for the appropriate provision of such technologies and support for the dissemination of the technologies. Aiming to ensure that end users can use advanced environmental technologies that are already in the commercialization stage with peace of mind, Japan will advance efforts to provide credit to third-party organizations to objectively demonstrate the environmental conservation effects, etc., of the technologies, while taking international circumstances into consideration.

(Utilization of AI, IoT, and other digital technologies)

Taking advantage of a combination of scientific findings on nudge actions and other behaviors and cutting-edge technologies, e.g., AI and IoT, namely BI-Tech, Japan will encourage citizens to proactively and positively change their awareness and behaviors and to shift to a lifestyle that contributes to decarbonization, resource circulation, and nature-positive. In this process, it will promote the development, demonstration, and implementation of such technologies to realize information conveyance tailored to individual citizens by leveraging generative AI, etc.

(2) Intrinsic needs-driven technological breakthroughs

Japan indispensably needs technological breakthroughs that meet the essential needs of citizens now and in the future, as seen in "What are the sources of Japan's vitality in the face of a declining population?" "What kind of technology is needed to maintain the sustainability of people's everyday lives in communities and Japanese industry?" "What are the bottlenecks that must be overcome to make a socio-economic system within the biocapacity of Japan and the

entire world?" In advancing discussions on this issue, we should see the issue from a different perspective: innovation can be generated not only by the development of cutting-edge technologies but also by the combination and horizontal deployment of technologies that have already been demonstrated and implemented.

(Thorough improvement of energy efficiency by using new materials, e.g., gallium nitride)
In order to achieve net zero greenhouse gas emissions by 2050, we need to backcast from future resource and environmental constraints, develop and demonstrate technologies to realize the ideal society and lifestyle of the future, and stabilize these technologies in society for the future. In particular, we should realize both further electrification and energy conservation and a prosperous society and lifestyle at the same time and as soon as possible, in view of future energy constraints. From this perspective, the industrial, civil (households and businesses) and transportation (vehicles, ships, and aircraft) sectors should strive to engage in research and development and dissemination of further energy conservation technologies, e.g., the development of next-generation power electronics technology using gallium nitride and other new materials, thereby contributing to reducing power loss in all aspects of society, achieving a significant reduction in CO_2 emissions, and, based on these efforts, aiming to realize "well-being/quality of life" for citizens now and in the future. In addition, Japan should accelerate catalyst discovery using quantum technology and AI (machine learning) and build a resource circulation system by using innovative catalyst technologies, e.g., multi-element nanoalloys so that it can not only realize a significant reduction in CO_2 emissions but also make use of local resources to contribute to the revitalization of communities and the realization of a self-reliant and decentralized society.

(Development and social implementation of technology for decarbonized mobility that also contributes to solving community issues)
Japan will further promote efforts for disseminating and promoting electrified vehicles, e.g., by introducing electrified vehicles and supporting the development of recharging and hydrogen-refueling infrastructure, and also will focus on entire mobility and promote the dissemination thereof in parallel with developing next-generation technologies and improving their performance, thereby contributing to helping communities and societies to satisfy their demands, including the realization of national land with a self-reliant and decentralized structure, the revitalization of communities, and overcoming challenges in communities, e.g., aging populations.

(Support for technology incorporating a "phase free" approach)

Technology incorporating a "phase free" approach realizes both "well-being/quality of life" in peacetime and disaster risk reduction in the event of disasters at the same time. This technology contributes to realizing a self-reliant and decentralized society, as described in Item 2 "Enhancement of the value of national land as stock placing natural capital as a basis" and has the potential to meet the essential needs of citizens in peacetime and in the event of disasters as well as the essential needs of future generations in depopulated areas which may face difficulties in maintain existing infrastructure due to population decline and depopulation. Based on this idea, Japan will promote the development, implementation, and dissemination of technologies, e.g., for a water circulation system that circulates and reuses water for domestic use,[154] perovskite solar cells as next-generation solar cells, and solar power generation integrated into building materials so as to expand installation sites.

(3) Promotion of research and development, etc. that become a basis for policy making based on scientific findings

Scientific findings are indispensable for promoting environmental policies, and investment in research and development, which form the basis for such findings, and human capital investment that supports such research and development, are important.

(Accumulation of scientific findings and development of basic information)

Aiming to contribute to policy making based on scientific findings, Japan will endeavor to maintain and improve the accuracy of measurement and analysis by environmental measurement and analysis organizations (municipalities and private organizations) by conducting surveys on the management of the accuracy of environmental measurement and analysis, and it will strive to collect, organize, and provide information on the status of the environment, etc. based on the results of observations and measurements and the basic information on research and technology in the field of the environment. In addition, Japan will facilitate the development of intellectual research infrastructure, e.g., database construction, and broadly provide related data to the public in an easy-to-understand manner through various media, e.g., websites and events. These efforts are important not only to deepen the public understanding of environmental issues and environmental conservation but also to encourage the national government, local governments, businesses, and citizens to participate in efforts for environmental conservation. Moreover, in the process of building the database, we will develop

[154] In the Noto Peninsula Earthquake 2024, hot showers using this technology played a role in improving the environment for evacuees.

an environment for information provision so that users can easily access the environmental information they seek. From the perspective of enhancing the conveyance of information on the results of research and technological development and promoting social implementation of the results, we will make efforts to convert various environmental data into open data and to advance data collaboration and sharing with various stakeholders, including international ones, so that collected, organized, and provided environmental information can be utilized to promote research and technological development involving the environment.

In addition, Japan will promote the following: administrative measures for biodiversity conservation, research aiming at the review of Red Lists that provide the basic information for TNFD and other private initiatives and for the evaluation of the initiatives, and regular review of the appropriateness of Red Lists based on such research. It will also aggregate and provide the results of various research for the natural environment, including the results of research on the habitat and growth of listed species.

(Acceleration of dissemination and development through further standardization and streamlined regulations)

In order to implement already established and newly developed technologies in society and to accelerate the dissemination and deployment of such technologies, an integrated approach is necessary, including the promotion of standardization, the streamlining of regulations and the making of international rules that incorporate environmental value in markets.

We will make efforts to review and demonstrate the legal system as well as the approval and permission procedures, corresponding to changes in technological progress. We will establish an environment and regulations as well as a system regarding the installation of energy systems and their security, and establish an environment impact assessment method and optimize its operation.

In addition, we will promote the international standardization of technical guidelines and certification systems related to strengthening international competitiveness, expand and promote international standards on energy and environment management, and move forward with the creation and expansion of a broad-scale framework, including local governments to put in place an energy platform.

(4) Development and demonstration of cutting-edge environmental technologies, etc., and promotion of social implementation of such technologies

Japan faces various crises, such as climate change, biodiversity conservation, infectious disease countermeasures, chemicals management, and disaster responses. Addressing these crises by using cutting-edge science, technology, and innovation is critical to the survival of Japan. In the process of developing and demonstrating technologies and implementing them in society, Japan should take into consideration the integration and synergy of not only individual environmental fields but also individual environmental policies. In addition, for the purpose of deploying technologies in the growing environmental market, we should not only consider how to disseminate technologies in markets seen from the aspect of the technologies but also develop, demonstrate, and implement technologies seen from the aspect of markets in parallel with ascertaining markets needs and keeping in mind the combination of existing products and services and new technologies.

Moreover, in accordance with the guidelines for emissions reduction stipulated in the Act on Promotion of Global Warming Countermeasures, businesses must select equipment and technology that contribute to the reduction of greenhouse gas emissions and must use the equipment and technology in a manner that reduce the amount of greenhouse gas emissions as much as possible. In light of this, we need to shift our selection of technology to the appropriate direction, e.g., "ideal state," as a viewpoint necessary not only for global warming countermeasures but also for other environmental fields.

(Comprehensive analysis of the relationship between biodiversity and other social issues and human health)

Biodiversity and climate change and other social issues have an interrelationship, e.g., synergy and trade-offs, and we should analyze and evaluate them from an integrated perspective in order to optimize measures therefor. We will advance the research and development of integrated assessments, scenarios, and models of biodiversity and socio-economic factors and reflect the results in the effective implementation of policies. We will clarify the direct relationship between biodiversity and human health and promote awareness raising of the positive impacts brought about by the relationship. Through this awareness rising, we will promote related research by taking advantage of the Environment Research and Technology Development Fund and other budgets in view of the importance of society-wide dissemination of the awareness of the importance of biodiversity.

(Scientific review of adaptation measures and mitigation measures)

Climate change is feared to have an impact on a wide range of sectors, including socio-economy

and biodiversity. In light of this, in the process of considering adaptation measures to climate change, it is important to evaluate co-benefits to various sectors. In this context, information on climate risks, e.g., data and scientific findings derived from observations, monitoring, projections, and assessments of climate change and the impacts of climate change, information on technologies and best practices involving climate change adaptation are basic information on which various stakeholders, including the national government, local governments, businesses, and citizens, work on adaptation to climate change. Therefore, we should further develop such information and improve accessibility thereto.

(Development and demonstration of technology in harmony with the environment and its social implementation)

Japan needs to advance the development, demonstration, and social implementation of technologies by taking into consideration not only contributions to individual aspects in the field of the environment but also harmonization with environmental aspects in other fields. Given that private companies are expected to launch projects for carbon dioxide capture and storage (CCS), which is a decarbonization technology, by 2030, Japan will advance the development of a system for environmental preservation so that companies can implement sub-seabed CCS appropriately and promptly in harmony with the preservation of the marine environment.

Focusing on the field of agriculture, which has been strongly affected by climate change, in particular, we will advance the following measures in accordance with the MIDORI Strategy for Sustainable Food Systems: developing varieties that are resistant to high temperatures, developing techniques for cultivation management adapted to the impact of climate change, shifting to varieties and items suited to high-temperature environments, and promoting adaptation technologies and other skills.

(Enhanced appropriate management of chemicals from a scientific standpoint)

Regarding the management of chemicals, particularly in the process of establishing a green economic system and developing science, technology, and innovation, companies are expected to create useful new chemicals and further use highly sustainable chemicals. To address this, Japan should manage potential risks for chemicals by appropriately conducting assessments and other measures in accordance with changes in the volume of chemicals manufactured and imported and changes in use thereof. In addition, we should share and convey the results of such risk assessment and findings, e.g., monitoring data, obtained in the assessment process in a form that citizens can easily access and use and should encourage the public to advance dialogues and risk communication, thereby contributing to promoting public understanding of chemicals

and leading to the smooth social implementation of new technologies that take environmental aspects into consideration and other techniques.

(Proper disposal of waste using state-of-the-art technology and thorough promotion of resource circulation)

Japan will subsidize technological development and demonstration targeting technology that promotes a sound material-cycle society, involves proper treatment of waste, has the potential for commercialization, and is excellent in terms of versatility and economic efficiency. In addition, it will promote the appropriate management of waste and resource circulation throughout the life cycle of technology by strengthening arteriovenous cooperation and developing information infrastructure in which various digital technologies, including electronic manifests, are utilized.

(5) Development, demonstration, and social implementation of "environment/life technologies" that utilize living organisms and the laws of nature

Low impact environmental technologies have been advancing rapidly in recent years. They include the following: technologies utilizing a symbiotic relationship with living organisms, such as low pesticide agriculture using a symbiotic relationship between microorganisms and plants; technologies that obtain ideas from superior functions and shapes of living organisms (biomimicry), e.g., anti-fouling materials that do not use any chemical compounds; and technologies that enable the production of useful substances by microorganisms and plants, not depending on fossil resources. These technologies achieve low environmental loads in a form closer to the laws of nature by utilizing and mimicking the functions that living organisms have. Based on this idea, this section describes measures to promote the research and development and social implementation of such low impact environmental technologies ("environment/life technologies") that utilize living organisms and the lows of nature.

(Promotion of the development, demonstration, and social implementation of "environment/life technologies")

Some private companies have already succeeded in the commercialization of "environmental/life technologies," as seen in clothing that takes advantage of water-repellent film technology (as an alternative for perfluoroalkyl substances and polyfluoroalkyl substances, or PFAS) that mimics the surface structure of lotus leaves or butterfly wings. Looking to the industrialization of "environmental/life technologies," Japan will develop and demonstrate solutions to social issues by utilizing biomimicry, which is a type of ecosystem services benefit,

as a source of innovation.

(Production of high-value-added chemical products from biomass)

Cellulose nanofibers and modified lignin, which are highly functional materials made from forest resources, are expected to contribute to global warming countermeasures as they improve fuel efficiency by reducing the weight of automobile parts and materials, and they are also anticipated to help the realization of a sound material-cycle society as they increase the biomass ratio in plastics and other chemical products and thereby reduce the amount of fossil resources used in such products.

In order to utilize these biomass-derived chemical products in a variety of applications, we will promote the development and demonstration of these products and lead the results to a variety of uses.

(6) Provision of support to startups in the field of the environment as a leading player in innovation

A wide gap lies between the goal to be achieved for the realization of a sustainable society that supports "new avenues for growth" and the future based on the assumption that no further efforts to reduce emissions will be made, i.e., the Business-As-Usual (BAU) scenario. In order to bridge this gap, we should create innovation in various fields that face challenges and implement innovation in society. Looking at overseas, startups have been creating innovation and solving various challenges, and in recent years, startups in Japan have begun to emerge as entities with the potential to have an impact on solutions to environmental issues. Against this backdrop, the government will provide the following measures to support startups serving as a leading player in innovation in the field of the environment.

(Provision of seamless support to environmental startups)

The Startup Development Five-Year Plan (decided by the Council of New Form of Capitalism Realization on November 28, 2022) sets a goal of investment at the level of 10 trillion yen in startups as a whole by FY2027, and states that "when people think of establishing a startup, they often aim to address social issues, such as environmental problems." In response, we should dramatically strengthen the provision of support to environmental startups, which are entities having outstanding environmental technological seeds and engaging in efforts to meet the essential needs of citizens now and in the future, in their R&D and social implementation of the outcomes. To this end, in line with the Small Business Innovation Research (SBIR) program under the "Act on Vitalizing the Creation of Science, Technology, and Innovation" (Act No. 63

of 2008) and other schemes, Japan will provide startups with financial and technical support in their phases of planning business, commercialization, and launching business as well as with business opportunities, e.g., by granting credit in such phases as commercialization. Through these initiatives, it will realize intensive, continuous, and seamless support to startups and enhance efforts for encouraging environmental startups and other entities to realize innovation and social implementation of the innovation.

In addition, it will also advance the provision of support to community-level environmental startups by providing the best available scientific findings and other data.

6. Contribution to national interests and the welfare of humankind by promoting strategic international cooperation centered on the environment

(Basic concept)

Global society is facing an unprecedented complex crisis together with energy and food crises. In order to achieve the goals by 2030 pledged by the international community, developed and developing countries need to work together on global environmental issues not being divided but across national borders, and the importance of this "cooperation" has been increasing more than ever before. While Japan should seek its benefits to the maximum extent possible, it needs to develop international cooperation centered on the environment in line with this global momentum and to contribute to global stability and the welfare of humankind. To this end, Japan should take strategic actions.

In taking actions to address the triple global crisis of climate change, biodiversity loss, and pollution, global society is required to build a socio-economic system that integrally realizes decarbonization, nature-positive, and a circular economy. Japan should take the lead in international discussions, e.g., by presenting good concrete examples of how to realize these goals, while keeping an eye on discussions on the post-SDGs era and maximizing synergies. In this process, Japan's past measures against pollution problems and its traditional value of everyday lives in harmony with nature and taking good care of products are considered useful in building a sustainable socio-economic system. Aiming to achieve simultaneous solutions to environmental issues and socio-economic issues, including the building of a Circular and Ecological Economy, Japan will conduct related efforts packaged with those for improving well-being/quality of life to ensure that no one is left behind. In parallel with this, it should convey and deploy the outcomes of these efforts to other countries, taking the opportunities of G7 and G20 meetings and other international occasions.

In promoting international cooperation centered on the environment, it is indispensable for Japan to strengthen partnerships with other countries and non-governmental entities. From the perspective of enhancing Japan's presence in international discussions and maintaining its high international position, the proactive involvement of Japan in international rule-making is extremely effective. In addition, Japan should strive to conduct sector-based and comprehensive measures for addressing climate change and other environmental issues to G7, G20, ASEAN, Pacific Island, Central Asian, South Asian, African and other countries so as to build cooperation ties between Japan and other countries and regions and contribute to solving environmental issues in these countries and regions, which helps Japan to strengthen partnerships with these countries and regions. Furthermore, we essentially need to adopt the point of view that we should focus on the importance of the role of non-governmental organizations played in global environmental issues and seek multilayered international cooperation covering not only governments but also municipalities, companies, and other entities. In particular, as efforts by cities, which account for about three-quarters of GHG emissions,[155] are considered important, we should promote inter-city cooperation to share knowledge and experience internationally. Moreover, with the gaining momentum of international discussions on environmental equity and justice, a just transition, and human rights in the background, Japan should appropriately address these discussions.

From the perspective of economic security, we need to fully address intensifying international competition by placing the environment at the core and taking into consideration the severe international situation. Looking at the struggle for natural resources, it is urgently necessary to further tackle the efforts for improving sustainability across the world. As addressing environmental issues is based on international scientific cooperation, the perspective of science diplomacy (science for diplomacy) is essential. Accordingly, Japan should promote measures for science, technology, and innovation that will form the basis for achieving economic security and science diplomacy.

Furthermore, as Japanese companies have many products and environmental waste-disposal infrastructure with excellent environmental performance, which are their competitive advantages in terms of technology and operational know-how, they are expected to grow

[155] The source of this data is the IPCC AR6 Synthesis Report: Working Group III Report. This estimate is based on consumption-based accounting, including both direct emissions from within urban areas, and indirect emissions from outside urban areas related to the production of electricity, goods and services consumed in cities. These estimates include all CO2 and CH4 emission categories except for aviation and marine bunker fuels, land-use change, forestry, and agriculture.

international markets and thereby contribute to Japan's growth.

Toward 2030, it is necessary to enhance synergies among climate change, biodiversity, and resource circulation in order to further raise the ambition of each country to achieve nationally determined contributions (NDCs) and to reach net-zero emissions. In addition, in light of the growth of the Global South and the situation of ongoing global diversification, the governments, municipalities, and companies should enhance multilayered collaboration and intra- or inter-regional collaboration, e.g., in Asia. They also should horizontally deploy and disseminate leading case examples and should encourage private investment in Japan through the overseas deployment of environmental infrastructure, including excellent decarbonization technologies, through which Japan will accelerate the virtuous circulation of the measures for the environment and against climate change and the building of sustainable society.

(1) Contributions to international rule making

To develop international cooperation through so-called "environmental diplomacy" and contribute to the stability of the world and the welfare of humankind, Japan will aim to enhance its presence in international discussions in the field of the environment. When addressing the triple global crisis of climate change, biodiversity loss, and pollution, it will leverage its experience as the G7 chair in 2023 and will strive to integrally realize net-zero emissions, a circular economy, nature-positive, and other goals, maximize synergies in parallel with executing leadership in international discussions, and contribute to rule-making.

(Contributions to the implementation of the Paris Agreement)

The first global stocktake to assess the collective progress towards achieving the purpose of the Paris Agreement and its long-term goals was conducted at COP28, held from November to December in 2023. This assessment uncovered that the 1.5°C target cannot be achieved even if the reduction targets currently set by each country are accumulated. As Japan has been making steady progress in emission reductions toward the 2030 goal, it will strive to demonstrate its results of emission reduction to the world and proactively contribute to discussions on improving the ambition of global measures against climate change to achieve the 1.5°C goal through the operation of the Paris Agreement.

Specifically, aiming to achieve the 1.5°C goal, Japan will encourage all parties to ensure that the next NDCs to be submitted by 2025 have ambitious reduction targets, covering all greenhouse gases, sectors and categories and are aligned with limiting global warming to 1.5 °C, as

informed by the latest science. In addition, it will provide assistance to developing countries as they need, including the formulation of net-zero targets, the improvement of accurate information on greenhouse gas emissions, and inter-city coordination. In addition, working with other countries, Japan will promote Article 6 (market mechanisms) of the Paris Agreement, transition to sustainable lifestyles, and other actions. Regarding carbon markets, it will promote the building of such markets that ensure integrity (quality), including voluntary markets, based on the "Principles of High Integrity Carbon Markets" adopted in the Communiqué issued at the G7 Ministers' Meeting on Climate, Energy and Environment in Sapporo and in accordance with Article 6 of the Paris Agreement.

(Strategic contributions to international discussions in light of the Kunming-Montreal Global Biodiversity Framework)

The Kunming-Montreal Global Biodiversity Framework (GBF), adopted at the 15th Conference of the Parties (CBD-COP15) to the Convention on Biological Diversity (CBD) in December 2022, is a global goal for biodiversity by 2030. In this context, we will contribute to discussions at CBD-COP and other meetings to be held before 2030 on the formulation of indicators to monitor progress made to achieve the goals and targets under the GBF and also will strategically contribute to a wide variety of international discussions on the natural environment and sustainable development goals, looking to the post-GBF after 2030 and the post-2030 Agenda. From a technical standpoint, we will integrally promote both international collaboration on biodiversity observation through the Asia-Pacific Biodiversity Observation Network (APBON) and contributions to international discussions on biodiversity status assessment, future projections, and scenario analysis through IPBES and other organizations.

(Promotion of international chemicals management)

We will continue to promote measures, including the sharing of Japan's knowledge and findings, to strengthen chemicals management in emerging countries and to harmonize chemicals management systems internationally.

In addition, Japan will promote the dissemination of its advanced mercury control technologies in overseas countries and contribute to the promotion of global mercury control measures and the Minamata Convention as a country that has experienced Minamata disease. In addition, it will lead discussions on the formulation of the details of the GFC operational rules as a representative of the Asia-Pacific region, and contribute to consensus building in the negotiations for the establishment of the science-policy panel on chemicals, waste and pollution prevention by utilizing Japan's knowledge and experience. In addition, Japan will promote the

steady implementation of the Stockholm Convention on Persistent Organic Pollutants based on its scientific findings.

(Measures against plastic pollution)

Japan took leadership in international discussions not only by sharing the "Osaka Blue Ocean Vision" at the G20 Osaka Summit held in 2019, but also by demonstrating the ambition to reduce additional plastic pollution to zero by 2040 at the G7 Hiroshima Summit held in May 2023. Japan will also proactively contribute to discussions at the Intergovernmental Negotiating Committee (INC) to develop an international legally binding instrument (treaty) on plastic pollution. At the same time, Japan will promote the harmonization of monitoring methods for marine litter, including plastics, thereby contributing to the enhancement of scientific findings, which will serve as the basis for international rules. In addition, Japan will contribute to information sharing and international cooperation under multilateral and bilateral frameworks, in particular, understanding the actual status of marine litter, including plastics and reducing such litter through the promotion of resource circulation and raising public awareness in Asia.

Looking at domestic initiatives, Japan has been promoting the reduced production, reuse, and sorted collection of waste plastics in accordance with the Resource Circulation Strategy for Plastics and the Plastic Resource Circulation Act. It will advance measures against plastic pollution with a view to contributing not only to resource circulation but also to climate change countermeasures and biodiversity conservation. In particular, with regard to the reduction of single-use plastics, it will accelerate efforts in accordance with the milestones set forth in the Resource Circulation Strategy for Plastics and the rationalized use of products that use specified plastics under the Plastic Resource Circulation Act.

(Contributions to international rule making for corporate activities in the field of the environment)

Amid the rapid expansion of sustainable finance, including ESG finance, more and more companies have been facing the importance of disclosure of corporate information not only on climate change but also on the circular economy and biodiversity. Against this backdrop, it is expected that global society will further advance the making of international rules for these fields going forward. To address this, we will conduct surveys and research as an effort for helping Japan to smoothly submit a proposal for new international standards, e.g., ISO/TC323 (circular economy) and TC331 (biodiversity).

Aiming to make sure that it can take the lead in the development of these new international rules,

Japan will conduct the following initiatives: providing Japanese companies with support in addressing related frameworks, e.g., the Circular Economy and Resource Efficiency Principles (CEREP) and the Taskforce on Nature-related Financial Disclosures (TNFD); building a platform on which countries are able to submit proposals for the standardization of international data that is the basis for such frameworks; and developing infrastructure necessary for indicator development, monitoring, and corporate information disclosure based on which international rules will be made as well as operating the achievements of the infrastructure.

(2) Provision of support to developing countries in the field of the environment

Japan will contribute to overcoming some environmental issues in certain fields, e.g., climate change and environmental measures, in developing countries, e.g., ASEAN, Pacific Island, South Asian, and African countries, thereby contributing to solutions to global environmental issues. In addition, it will strengthen partnerships with these countries.

(Contributions to decarbonization in developing countries through the Joint Crediting Mechanism (JCM), etc.)

Taking advantage of the Joint Crediting Mechanism (JCM), Japan will accelerate the dissemination of green products, systems, services, and infrastructure, including outstanding decarbonization technologies, and the implementation of mitigation activities, thereby contributing to sustainable development in developing countries. In addition, it should place importance on mobilizing private-sector funds, and, at the same time, upgrading relevant technologies and know-how through overseas business development and infrastructure development so that it can promote the deployment of products and infrastructure with even greater environmental performance and added value in both domestic and overseas markets. As part of its demand-side measures, it will encourage consumers to change their behavior and lifestyles.

(Contributions to improving the transparency of reduction efforts overseas, including developing countries, through observations by the GOSAT series satellites)

Using GOSAT series satellites, e.g., ongoing GOSAT and GOSAT-2, and GOSAT-GW which is scheduled to be launched in 2024, Japan will conduct continuous global-scale observations, estimate the emissions from given countries and their cities, develop international standards for emission estimation methods, and provide bilateral and other support, through which it will contribute to helping countries, including developing countries, to improve the transparency of emissions reports to the UN as well as of their reduction efforts. In addition, Japan, even after

the 2030s, aims to continue to contribute to the development of science related to global climate change, which targets developing countries as well, and to improve the accuracy of emission estimates at the levels of countries and cities, and to this end, it will advance deliberations on successors to these greenhouse gases observing satellites, taking into account international trends.

(Enhanced provision of swift support to vulnerable countries to address environmental loss and damage)

Many countries that are vulnerable to climate change have been needing support for adaptation and loss and damage. Japan, which is prone to natural disasters, has know-how, knowledge, and technology in disaster response, and possesses outstanding weather and climate change forecasting technology and services. It will provide meticulous support tailored to the needs of each of these vulnerable countries and communities, while promoting and taking into account gender equality and the participation of community residents. In addition, as an ideal approach to providing sustainable support, Japan will encourage the overseas deployment of climate change adaptation businesses. Toward this overseas deployment, it will aim not only to reduce the impacts of climate change on the socio-economy and biodiversity but also to bring about co-benefits with Nature-based Solutions (NbS), Ecosystem-based Disaster Risk Reduction (Eco-DRR), and other mitigation measures.

(International cooperation for the water and air environments)

Water and air environment pollution remains a serious problem in developing countries in Asia and other regions. To promote measures against this pollution, Japan will facilitate international cooperation, e.g., in the sharing of Japan's findings and experience, technology transfer, and capacity building through the following initiatives: building multilateral frameworks, e.g., the Water Environment Partnership in Asia (WEPA) and the Acid Deposition Monitoring Network in East Asia (EANET), a body which has expanded its scope to include all air pollutants; conducting air pollution policy dialogues and joint research on yellow sand under the Tripartite Environment Ministers Meeting among Japan, Korea, and China (TEMM); promoting a co-benefit approach to air pollution and climate change measures in collaboration with the UN Environment Programme (UNEP), Clean Air Asia (CAA), the International Institute for Applied Systems Analysis (IIASA), and other entities; and building bilateral cooperation.

(Contributions to the ASEAN region based on the ASEAN-Japan MIDORI Cooperation Plan)

Japan's efforts under the "MIDORI Strategy for Sustainable Food Systems " can serve as a role

model for sustainable food systems in the Asian monsoon region, whose climatic conditions and agricultural production structures are similar to Japan. Based on the "ASEAN-Japan MIDORI Cooperation Plan," which was adopted at the ASEAN-Japan Ministers of Agriculture and Forestry Meeting held in October 2023, Japan will advance cooperation projects that make use of its technologies and experience while meeting the needs of ASEAN economies.

(Promotion of sustainable forest management and wood use in developing countries in collaboration with international organizations)

Aiming to contribute to the realization of a net-zero society around the world in light of the outcomes of the G7 Hiroshima Summit held in 2023, Japan will support developing countries in promoting sustainable forest management and wood use, including measures against illegal logging. It will also develop initiatives and convey information on them in collaboration with the "Sustainable Wood for a Sustainable World (SW4SW)" jointly led by the Food and Agriculture Organization (FAO) and the International Tropical Timber Organization (ITTO), and other international initiatives as well as with other interested countries.

(3) Efforts for addressing economic security

Demand for base metals (e.g., copper) and rare metals (e.g., lithium and cobalt), which are indispensable for the realization of decarbonization, has been growing, and global society has been facing not only a tight supply-demand balance for mineral and other resources and price hikes but also the emerging risk of supply disruptions. To address this situation, Japan will promote thorough resource circulation in the international value chain, and thereby significantly reduce climate change, biodiversity loss, and environmental loads, e.g., pollution, as well as contribute to its own economic security.

(Promotion of thorough resource circulation in the international value chain)

The International Resource Panel (IRP) report points out that mineral extraction and processing around the world account for around half of the global greenhouse gas emissions, 90% of biodiversity loss and negative water stress, and around one-third of health impacts caused by particulate matter. To overcome this, we will focus on both international environmental loads reduction and economic security, and from these two perspectives, strengthen the circulation in the international value chain of companies, and promote the reduction of natural resource use. Moreover, we will fortify metal resource circulation, including domestic and overseas important minerals, through appropriate and sophisticated recycling and other means.

(4) Overseas deployment of Japan's outstanding efforts

Japanese people have cultivated a way of relating to nature by maintaining and improving the value of nature through taking care of it, and they have been sharing the value of resource circulation, as seen in the term *mottainai* (or "what a waste"). This is not only a quality that Japan can boast to the rest of the world, but also a characteristic of Asian countries, including Japan, in which people share climate, culture, and customs. Japan should work to further refine this strong point to gain international recognition and should execute leadership in international efforts, including those in Asian countries. In this context, it will disseminate its outstanding efforts to and deploy them in other countries, including the Circular and Ecological Economy vision, also working with Expo 2025 Osaka, Kansai, Japan.

(Demonstration of synergies among various fields, e.g., climate change, biodiversity, resource circulation, etc.)

Aiming to maximize the use of its technology and findings to overcome the triple global crisis of climate change, biodiversity loss, and pollution and achieve SDGs goals in an integrated manner, Japan should take the lead in promoting initiatives to increase synergies among these interrelated issues and minimize trade-offs, thereby achieving a net-zero, circular, and nature positive economy. To this end, based on a resolution proposed by Japan and adopted at the UN Environment Assembly in March 2024, Japan will work with other countries and international organizations to gather good case examples of synergies, including Nature-based Solutions (NbS), and will formulate guidance for policy making based on these examples. Moreover, Japan will work with IPCC, IPBES, IRP, and other organizations to advance scientific analysis of synergies and support activities for such analysis. As efforts for ensuring that funds flow to initiatives that realize synergies, it will strive to not only mainstream the perspective of synergy in the Official Development Assistance program and Multilateral Development Banks but also promote information disclosure in the corporate value chain.

(Construction of appropriate resource circulation systems and promotion of overseas expansion of the resource circulation industry)

Concerning metal resources, including critical mineral resources, generated in overseas countries, e.g., in ASEAN and OECD economies, we will establish an international metal resource circulation system to enhance the appropriate recycling of metal resources by taking advantage of Japan's advanced environmental technologies and to reuse the resources in supply chains. Moreover, we will make use of international platforms on which Japan executes leadership so as to encourage developing countries in Asia and Africa to make transition to a

circular economy, facilitate efforts for waste management initiatives, including reduction of methane emissions from landfills, and strive to increase demand for waste management and other services in which Japan has an advantage, thereby leading the results to the international business expansion of the resource circulation industry as well as to the exports of circulation infrastructure from the industry.

(Further phasing out of fluorocarbons throughout the global value chain)

Taking advantage of the Initiative on Fluorocarbons Life Cycle Management (IFL), which was established by Japan to promote the life cycle management of fluorocarbons, Japan will contribute to the phasing out of fluorocarbons around the world and the reduction of fluorocarbons emissions in cities by advancing the following initiatives, in parallel with exercising international leadership and leveraging its experience: disseminating energy-efficient non-fluorocarbon equipment, and providing technical cooperation to developing countries involving the prevention of leakage of fluorocarbons from equipment in use as well as involving the recovery, destruction, and recycling of fluorocarbons in the disposal of equipment.

Chapter 3 Development of priority measures in individual fields

Environmental policies began with pollution control and nature conservation, and they have since expanded to include global environmental issues, e.g., climate change, waste, and biodiversity. Japan has been promoting measures to address these issues by formulating government plans in individual fields in parallel with working to promote international cooperation and collaboration in addressing these issues. Still, as some issues have not been fully addressed yet, Japan should continue to take the following measures with the aim of achieving a circular, symbiosis based society and a Circular and Ecological Economy and from the perspective of "new avenues for growth": reducing the total amount of environmental loads; steadily promoting the six priority strategies, which are cross-cutting measures, and priority measures in other individual fields, in order to realize well-being; and strengthening measures for issues that have not been fully addressed.

1. Climate change measures

(1) Mitigation

The IPCC AR6 Synthesis Report released in March 2023 stated that "Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming" and that "Continued greenhouse gas emissions will lead to increasing global warming, with the best estimate of reaching 1.5°C in the near term," showing a grim outlook. This is a strong message from science to humanity, indicating that rapid, significant and immediate reductions of greenhouse gas emissions are needed in all sectors over the next decade.

The report also stated that in the global modelled pathways, the best estimates of the remaining carbon budgets are 500 $GtCO_2$ for a 50% likelihood of limiting global warming to 1.5°C and that global GHG emissions are needed to decrease by around 43 [34 to 60]% below 2019 levels by 2030 and 60 [49 to 77]% by 2035, relative to the 2019 level.[156]

The decision on global stocktake at COP28 emphasizes the need for urgent actions to keep the 1.5°C goal by taking into account scientific findings. In addition, decisions were made on the following points: peaking global GHG emissions at the latest before 2025; setting ambitious emission reduction targets covering all greenhouse gases and sectors; tripling renewable energy capacity globally

[156] The G7 Hiroshima Leaders' Communiqué states as well that "We highlight the increased urgency to reduce global GHG emissions by around 43 percent by 2030 and 60 percent by 2035, relative to the 2019."

and doubling the global average annual rate of energy efficiency improvements; and transitioning away from fossil fuels in energy systems.

The key to achieving the 1.5°C goal is how much the countries of the world, as well as Japan, can increase their ambition for reduction and achieve it. To this end, Japan will strive to ensure the sufficiency of its efforts (in terms of speed and scale) based on the best available scientific findings and will work on global measures against climate change through the utilization of its technologies and know-how and collaboration between the public and private sectors.

Japan has upheld the goal of "net-zero greenhouse gas (GHG) emissions by 2050" and the goal that "Japan will continue strenuous efforts in its challenge to meet the lofty goal of cutting its emission by 50%," which are consistent with the 1.5°C goal. In line with this, it has steadily achieved a 20.3% reduction as of FY2021 from the FY2013 level. As its efforts to achieve the goal, Japan will promote a shift to decarbonized power sources, e.g., the promotion of thorough energy conservation and the maximum possible introduction of renewable energy, not only by taking into account the G7 agreement of a "fully or predominantly decarbonized power sector by 2035" but also by according to the Plan for Global Warming Countermeasures, the GX Promotion Strategy, etc. It will also continue to accelerate related efforts by mobilizing all measures, e.g., leveraging the GX Economy Transition Bond for providing support to prior investment at the level of 20 trillion yen so as to swiftly realize and implement the Pro-Growth Carbon Pricing Concept.

On that basis, Japan will accelerate the deliberations on the next Nationally Determined Contribution (NDC), which it is recommended to submit to the UN by 2025 and Japan will aim to submit in that year, in parallel with discussing the review of the Plan for Global Warming Countermeasures every three years and taking into account the IPCC scientific finding and other data. In advancing the review of the Plan for Global Warming Countermeasures, Japan will hold deliberations by taking into account the following points: future directions shown in the Plan, including Part 1; initiatives for communities and cities; use of Article 6 of the Paris Agreement; and matters set out in the decision on the global stocktake, e.g., removal measures utilizing ecosystems, including forests.

(2) Adaptation

The IPCC AR6 Synthesis Report states that the global average temperature has risen about 1°C above pre-industrial levels by around 2020 and this already has led to extreme high temperatures,

heavy rainfall and drought and associated impacts on ecosystems and human systems.

Like other countries, Japan has been facing growing impacts of climate change throughout the country that are caused by a rise in average annual temperatures, which is progressing at a rate faster than the global average, and an increase in the frequency of heavy rain, and other factors, as seen in a decrease in the quality of agricultural products, an increase in natural disasters, and an increase in the risk of heat illness. This shows that the issue of climate change is a "climate crisis" that threatens the very foundations of human existence and the survival of all living organisms.

However, even if the global society steadily implements measures to combat climate change with the aim of achieving net zero emissions by 2050 and even if this succeeds in limiting global temperature rises to around 1.5°C, we cannot avoid extreme events, e.g., heat waves, heavy rainfall, and other serious climate change. Based on this expectation, we should avoid and mitigate current damage and expected damage in the future, and for this purpose, we need to work on efforts for adapting to climate change and for addressing loss and damage associated with the adverse effects of climate change, regarding these efforts as an urgent issue, which should be dealt with in the same manner as mitigation measures.

To this end, in collaboration and working with various stakeholders, Japan will steadily promote measures to adapt to climate change, placing the Climate Change Adaptation Act and the Climate Change Adaptation Plan (hereinafter referred to as the "Adaptation Plan") as the basis. In addition, since priority fields in which adaptation measures should be taken by priority and the optimal adaptation measures vary among communities, municipalities should strive to formulate a Local Climate Change Adaptation Plan[157] that meets the conditions of the respective regional areas and will endeavor to promote adaptation measures based on the plan. In formulating such plan that meets the conditions of regional areas and promoting adaptation measures, the role of prefectures, municipalities and Local Climate Change Adaptation Centers is considered important, and to address this, Japan will facilitate efforts to strengthen their ability.

Adaptation to climate change is also important for the private sector. Taking on strategic efforts for adaptation will not only enhance the sustainability of the value chain but also increase the

[157] Article 12 of the Climate Change Adaptation Act (Local Climate Change Adaptation Plans)
In view of the Climate Change Adaptation Plan, prefectures and municipalities shall, either independently or in coordination with each other, endeavor to formulate a local climate change adaptation plan (meaning a plan for adapting to climate change suitable to the natural, economic and social circumstances in their region) in order to promote policies regarding Climate Change Adaptation, in accordance with the natural, economic and social circumstances of their local area.

competitiveness of companies, e.g., creating opportunities for new business (adaptation business), and, accordingly, we will promote efforts to strengthen companies' ability to adapt to climate change.

When considering and implementing adaptation measures, we need to take into account climate change impact assessments and projections based on the latest scientific findings. Therefore, we will endeavor to not only enhance scientific findings, e.g., creating climate change projection data, but also provide such findings, improve accessibility to them, and strengthen our capacity to utilize them. When popularizing the adaptation to climate change, we should encourage citizens and other stakeholders to view climate change as their own business and change their behavior. Accordingly, we will take on public awareness raising and PR activities so that people can learn more about scientific findings.

In parallel with this, Japan will continue to work on efforts for integrally solving problems and enhancing synergies, including incorporating a wide range of fields covering socio-economic aspects (e.g., health, disaster prevention and mitigation, agriculture, forestry, fisheries, and biodiversity conservation) into policies and evaluating co-benefits with mitigation measures.

Japan will expand its initiatives for regional areas, companies, and scientific findings mentioned above, to other countries, thereby working on international support for adaptation to climate change and loss and damage measures, which are issues in which developing countries are particularly interested in. Moreover, it will also strive to expand adaptation business by deploying its outstanding technologies and services to other countries.

2. Establishment of a sound material-cycle society

For establishing a sound material-cycle society, we will formulate the Fifth Fundamental Plan for Establishing a Sound Material-Cycle Society by the summer of 2024 in accordance with the Basic Act on Establishing a Sound Material-Cycle Society and in line with the Plan, and then it will accelerate the transition to a circular economy based on the measures stipulated in the Fifth Fundamental Plan for Establishing a Sound Material-Cycle Society, thereby aiming to establish a sound material-cycle society and build sustainable communities and societies.

(1) Create sustainable communities and a sustainable society by transitioning to a circular economy with the aim of forming a sound material-cycle society

Japan will promote a circular economy approach that is effective to improve the efficiency and circulation of resources throughout the value chain and will conduct integrated measures for a circular economy and net-zero emissions, for a circular economy and nature-positive, or for all of these three efforts so that it can advance the transition to a circular economy. In addition, it will contribute to realizing net-zero emissions, nature-positive, and regional and community revitalization as well as enhancing international industrial competitiveness and building economic security, in parallel with building a sound material-cycle society and achieving a sustainable society.

(2) Thoroughly circulate resources throughout the entire lifecycle through resource circulation-oriented coordination between business operators

We will accelerate resource circulation through arteriovenous cooperation in which organic collaboration is made between efforts in arterial industries, e.g., manufacturing and retailing, and efforts in venous industries, e.g., waste disposal and recycling, and will support the creation of a resource circulation market having mid- to long-term resilience. Following this, aiming to realize a sound material-cycle society, we will promote industry-government-academia collaboration to advance efforts involving the promotion of resource circulation in arterial industries, which also contributes to ensuring economic security and realizing decarbonization. Moreover, we will establish a decarbonized resource circulation system in venous industries. Furthermore, taking into account the Timetable of the Follow-up on the Growth Strategy, the Circular Economy Roadmap, and other schedules, we will promote the transition to a circular economy, e.g., by utilizing investment in green transformation (GX), to achieve the goal of increasing the market size of business engaging in the circular economy to over 80 trillion yen by 2030.

When promoting resource circulation through arteriovenous cooperation, Japan will note certain perspectives, e.g., ensuring product safety, managing the risk of hazardous substances, and preventing illegal dumping and improper disposal, and encourage respective stakeholders to make appropriate efforts. In parallel with this, it will promote further efforts for materials and products in which thorough resource circulation throughout their life cycle should be considered from the viewpoint of their environmental loads, the amount of waste they generate, and their contribution to decarbonization. Furthermore, it will focus on sorting, collection, and use of circulation resources, hold dialogues and commutation with consumers and community residents, and, by making use of these occasions, encourage such consumers and residents to proactively and voluntarily change their awareness of environmental issues and visualize

environmental values, thereby leading to change in the behavior of the consumers and residents and encouraging them to take concrete actions.

(3) Build diverse regional circulation systems and revitalize regions

Japan should establish sustainable communities that contribute to net-zero emissions and nature-positive and as well as to a sound material-cycle society with high resource productivity. To this end, it will promote efforts to circulate circular resources on the optimal scale tailored to each community and each resource, while also taking into consideration the natural capital of each community. It will help communities to continuously utilize their renewable resources in the communities and to properly maintain and manage community stock and wisely use it for as long as possible and, thereby, will curb resource input and waste generation, leading to the building of sustainable and vibrant communities.

In addition, Japan will develop initiatives for resource circulation in which manufacturing businesses, waste disposal and recycling businesses, and various community stakeholders (e.g., local governments and citizens) voluntarily and jointly participate and in which they create high added value by taking advantage of the characteristics of circular and renewable resources in communities, through which Japan will create further innovation. Moreover, it will disseminate the following movement from one community to another to the entire nation so as to lead the results to the growth of Japan as a whole: encouraging the initiatives for resource circulation above to become autonomous and large so as to stimulate the inflow of human resources from outside communities and the creation of jobs and vitalize community economy as a result; bringing about secondary effects, e.g., building an attractive community by increasing the number of exchange population and investment in the community; and triggering new initiatives for resource circulation in different communities, thereby building a virtuous cycle.

Furthermore, Japan, focusing on the actual situation of marine litter, e.g., plastics, will aim to build a society free from the problems of marine litter and plastic pollution by taking waste control measures effectively and efficiently as well as collecting and treating such litter, including inland litter, and by enhancing international collaboration.

(4) Improve resilience of platform for circulating resources and managing waste, steadily and appropriately dispose of waste and restore the environment

Japan will focus on the development of necessary technologies, ensuring traceability, and

improving efficiency for promoting new business models related to a circular economy (e.g., the advancement of recycling through the disassembly, crushing, and sorting of used products, the further introduction of biomass, the further promotion of recycled materials, the establishment of the 3Rs initiative in the fields of new products and new materials that have been rapidly popularized, and the visualization of environmental loads) in communities and societies as a whole, and from these perspectives, it will make full use of the latest technologies, e.g., digital technology and robotics, to strike a balance between enhancing the resilience of the foundations for resource circulation and waste management and decarbonizing the field of resource circulation. In addition, Japan will ascertain information on resource circulation to promote arteriovenous cooperation and develop an information platform that utilizes various digital technologies.

In the event of disasters, we should properly and quickly treat not only everyday waste and human waste but also disaster waste. In preparation for this in peacetime, the national government, local governments, research and specialist institutions, private businesses, and other entities should promote collaboration in terms of human support and wide-area waste processing, for example, and local governments, regional blocks, and all areas across Japan should enhance the resilience of their waste processing systems in a multilayered manner. Through this, Japan will aim to establish a society that can process disaster waste appropriately and quickly.

Japan will aim to build a society with appropriate systems, structures, and technologies in place for the proper disposal of waste. In addition, it will make as much use as possible of waste in a circular manner in the order of the R+Renewable effort first and heat recovery during incineration second, and after ensuring that these steps have been thoroughly carried out, it will make sure that the remaining waste has been disposed of appropriately. It will also steadily strengthen measures against improper waste disposal, eradicate illegal dumping, and promote measures against hazardous waste, while also promoting the reliable and proper disposal of PCB waste within the designated time frame.

Jointly with local governments and other stakeholders, the national government will work in unison to ensure the appropriate treatment of waste contaminated by radioactive materials as well as to reduce the volume of the soil and waste removed in-site decontamination work (removed soil and waste) and reuse the soil for final disposal in order to achieve environmental regeneration in the areas affected by the Great East Japan Earthquake.

(5) Build a proper global resource circulation system and promote the overseas expansion of Japan's resource circulation industry

Taking international opportunities, e.g., G7, G20, OECD, and ASEAN meetings, and bilateral and multilateral cooperation opportunities, Japan will strive to execute leadership in discussions on the following: measures for a circular economy and resource efficiency, including 3Rs; international agreements on resource circulation; appropriate imports and exports of recyclable waste, etc.; and measures against plastic pollution as well as deliberations on international resource circulation. When promoting a circular economy, taking into consideration the differences in systems and social infrastructure between countries, countries should deepen information sharing and mutual understanding, e.g., through public-private dialogues under such frameworks as the Circular Economy and Resource Efficiency Principles (CEREP).[158] Moreover, working with international organizations, private sectors, and other entities, Japan will also execute leadership in making international rules for value chains, circularity at the level of organizations, and other environmental matters.

We will establish an international resource circulation system based on the ASEAN-Japan partnership and the G7 agreement on member countries' commitments to increasing domestic and international critical minerals and materials recovery and recycling.

Under the frameworks of bilateral and multilateral cooperation and collaboration, Japan will deploy a package of its outstanding schemes, systems, technologies, and other approaches involving resource circulation to other countries, including ASEAN and other developing countries. Through this effort, it will help these countries strengthen proper waste management and resource circulation, contribute to reducing environmental pollution and other damage, and mitigate global resource constraints.

3. Securing biodiversity and living in harmony with nature

With regard to securing biodiversity and living in harmony with nature, Japan formulated the "National Biodiversity Strategy and Action Plan of Japan 2023-2030" (cabinet decision on March 31, 2023) in accordance with the Basic Act on Biodiversity, in response to the new global framework of the "Kunming-Montreal Global Biodiversity Framework" adopted at the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity in 2022. Based

[158] In November 2023, a Joint G7-B7 Workshop on CEREP was held by the Ministry of the Environment and Keidanren.

on this strategy, by 2030, it will strive to realize the "nature-positive," which means halting and reversing biodiversity loss to put nature on a path to recovery. Through this effort, it will lead the outcomes to realize a society in harmony with nature, the vision 2050 on biodiversity. In the process of achieving the nature-positive, by securing healthy ecosystems that serve as a foundation for the survival of humans, maintaining and restoring the benefits of nature, and expanding socioeconomic activities aimed at protecting and use of natural capital, Japan will make efforts according to the following five basic strategies in collaboration not only with the existing biodiversity conservation measures but also with measures in various fields, e.g., for climate change and resource circulation. It will also promote related measures taking into account the priority strategies shown in Chapter 2 above and the system for environmental conservation measures described in Part 3 below. In light of the international trends in discussions on the review mechanism under the Kunming-Montreal Global Biodiversity Framework and other tendencies, Japan will evaluate the progress made in achieving the state-oriented targets and action-oriented targets set out in this strategy.

(1) Restoration to healthy ecosystems

Setting the achievement of the 30by30 target to conserve at least 30% of land and sea by 2030 as an indicator, Japan will conduct efforts for promoting the improvement of protected areas, e.g., national parks and quasi-national parks, the effective establishment of "Other Effective area-based Conservation Measures" (OECMs), and the restoration of degraded ecosystems, aiming to secure a healthy ecosystem, which is a basis that bolsters our everyday lives. In addition, it will focus on the improvement of the value of the national land as stock placing natural capital at the core, and, from this viewpoint, it will strive to secure habitats and breeding grounds for species, including common species, targeting the entire national land, and will improve their connectivity.

When advancing the conservation and management of wildlife, Japan will implement the following efforts focusing on individual species while dealing with urgent issues precisely: *in-situ* conservation of endangered wildlife, including species found in secondary nature, and effective ex-situ conservation and reintroduction to the wild to support these conservation efforts; appropriate wildlife population management, such as wide-area capturing and securing a workforce for this; dealing with species that are in urgent need of control and species that are widely kept and feared to be easily abandoned in measures against alien species.

(2) Application of Nature-based Solutions (NbS) to Address Social Challenges

We will place importance on the concept of Nature-based Solutions (NbS), which contribute to both human well-being and biodiversity by making use of the benefits of nature to resolve diverse social issues. In particular, aiming to effectively demonstrate the climate change mitigation (sink) and adaptation (disaster risk reduction) functions of natural ecosystems, we will promote the conservation and restoration of forests, wetlands, coastal ecosystems, etc. and also endeavor to enhance synergy between climate change measures and biodiversity conservation through the appropriate management of Satoyama by leveraging biomass resources. Moreover, while avoiding or minimizing trade-offs between climate change measures and biodiversity conservation, e.g., preventing the introduction of renewable energy in a way that would impede the conservation of the natural environment, we will promote climate change measures, e.g., the proactive introduction of renewable energy in harmony with local communities, while giving full consideration to building consensus in the local communities without harming the natural benefits of the local area.

To address challenges that regional areas face, e.g., aging population and depopulation, we will conserve and utilize nature's rich bounty in communities and traditional culture rooted in the natural environment in such communities, e.g., by conducting the Project to Fully Enjoy National Parks and maintaining, managing, and upgrading park facilities as well as by developing eco-tourism and other activities. Through these efforts, we will vitalize tourism, create new industries and employment, and expand exchange between regional areas with city areas, build a virtuous cycle of protection and use of the natural environment, and facilitate the building of sustainable, prosperous, and vibrant communities.

In order to reduce damage caused by wildlife and alleviate conflicts between people and wildlife, Japan will advance efforts for the separation of people's residential areas from the habitats of wildlife by leveraging the resources and zoning under the *satochi-satoyama* initiative, and, at the same time, it will promote efforts for the coexistence of people and wildlife, e.g., damage prevention measures, capture-based population management, environmental management to prevent wildlife from appearing in city areas, and community revitalization by the effective use of captured wildlife.

(3) Realization of a Nature Positive Economies

To realize sustainable economic activities that realize nature-positive, there is a need to understand the current situation in which natural capital causes positive externality and its loss

causes negative externality, and to internalize it through various means.
As a part of such efforts, Japan will promote joint efforts by the government and businesses to assess risks and opportunities in business activities related to biodiversity and natural capital, to set targets, and to disclose information.

Through ESG finance and other initiatives, Japan will realize a transition to an economy that incorporates risks and opportunities related to biodiversity and natural capital, and implement measures to ensure that businesses become drivers for realizing nature-positive based on the Transition Strategies toward Nature Positive Economies.

(4) Recognition of the Value of and Actions for Biodiversity in Daily Life and Consumption Activities (Changing Individual Behavior)

To realize nature-positive, in addition to everyday activities and efforts that are biodiversity-conscious at the individual and group level, it is also extremely important to approach consumers, businesses, investors, and others who form part of the supply chains through consumption and use. In this context, Japan will implement measures to restore and deepen the close connection between biodiversity and lifestyle/consumption activities of the past, utilizing new technologies. Japan will implement the measures taking into account that perspectives may differ, given that the way of engaging with and understanding biodiversity depends on gender, age, and other factors, and will respond to include gender perspectives and communication with young people.

Moreover, it will accelerate these measures so that individuals can be aware of "well-being/quality of life" through some other measures, e.g., promoting their interaction with nature and realizing a society in which people can live in harmony with animals.

(5) Development of a Base that Underpins Activities for Biodiversity Conservation and Promotion of International Coordination

To effectively promote efforts for the conservation and sustainable use of biodiversity, Japan will accurately assess and determine the current status of the natural environment and its chronological and spatial changes, enhance basic surveys and monitoring (e.g., the National Survey on the Natural Environment and the Monitoring Sites 1000 project) that lead to the evaluation of biodiversity and development of information that is easy to use, introduce survey methods in which new technologies (e.g., environmental DNA) are utilized, secure experts and

the workforce for the development and improvement of survey systems, and provide support for related activities. To raise the overall level of efforts related to biodiversity, the government will adopt required legislative, financial, or tax measures as well as promote cross-sectional efforts through the cooperation among various stakeholders.

Furthermore, we will proactively participate in the formation of fair and effective international rules for global biodiversity and its sustainable use. Aiming to contribute to the conservation of biodiversity on a global scale, we will also advance the following efforts: international cooperation by making use of Japan's knowledge and experiences; contributions to the efforts to address issues in environmental fields other than biodiversity through Nature-based Solutions (NbS); contributions to IPBES; and research conducted to combat desertification in the Asia-Pacific region.

4. Management of environmental risks, etc.

(1) Environmental conservation of water, air, and soil

[i] Protection of human life and the environment

Environmental administration in Japan has begun with measures to protect the public's health and living environment by preventing the pollution and contamination of the air, public water areas, groundwater, and soil. Japan will continue to promote the measures steadily and steadfastly.

It will establish environmental quality standards for water, air, and soil environments, which are the basis for our survival, and continue to appropriately conduct actions to ceaselessly improve the measures above under the related laws and regulations, including the Air Pollution Control Act, the Water Pollution Prevention Act, and the Soil Contamination Countermeasures Act.

In particular, with regard to environmental quality standards, which are an administrative goal, we will strive to collect the latest scientific findings and to maintain and further improve the substance items that highly satisfy the standards and take measures to improve the items that satisfy them to a lesser extent, thereby preventing pollution and identifying the mechanism of bottlenecks.

In addition, regarding the substances for which no such standards have been established, we will take various measures based on scientific findings to ensure the safety and security of citizens

as necessary, including the establishment of target values and the promotion of voluntary efforts.

[ii] Response to climate change, biodiversity, sound material-cycle society, etc.

As an approach to achieving net-zero emissions by 2050, we will advance such measures as expanding the use of renewable energy and disseminating electric vehicles, taking into account a way to make both environmental conservation measures and climate change measures optimal. We consider that a measure for reducing photochemical oxidants is effective (to bring about co-benefit) for both of the measures mentioned above, and priority will be given to this reduction. In addition, since there is concern about the impact of climate change on the aquatic environment, we will make efforts to strike a balance between the adaptation to climate change and the conservation of water quality and that of ecosystems.

Japan will focus on the demonstration of multifaceted functions of the sea, e.g., spawning grounds, habitats, growth sites, water purification, and CO_2 removal and fixation, and on the contribution to the 30by30 target for the sea by leveraging OECM, and from this viewpoint, it will advance the conservation, restoration, and creation of tidal flats, seagrass meadows and macroalgal beds, and promote the utilization of local resources in coastal areas, including tidal flats and seagrass meadows and macroalgal beds, thereby carrying out "satoumi" creation, an approach to building a virtuous cycle of conservation and utilization. It will promote measures that are co-beneficial to biodiversity conservation, climate change, and the building of a sound material-cycle society, e.g., setting water environmental quality standards for the conservation of aquatic organisms and promoting measures against marine litter and plastic pollution. Furthermore, for realizing nature-positive, it will fortify measures that contribute to the enhancement of biodiversity conservation also for the water and soil environments and measures that utilize the natural environment and biodiversity, e.g., promoting NbS through the creation of a good environment. Focusing on the environmental services of soil, e.g., carbon storage and water source fostering, Japan will collect and organize information on such ecological services, also covering soil in cities, in a form that people can smoothly use in building better communities and other efforts.

[iii] Creation of a good environment

We consider it important not only to aim at a good environment to build a sustainable society by making use of environmental policies for water and air and pass it on to the next generation but also to develop circumstances that enable people to experience a good environment and make use of it sustainably so as to bring about specific advantage to their communities, e.g., enhanced satisfaction (well-being) among people and community revitalization. To achieve this,

we will conduct measures for conserving, restoring, and creating a "good environment" in communities, evaluating and conveying the value of the environment, and promoting its sustainable use.

Specifically, Japan will carry out the following initiatives aiming at the creation of a good environment: improving the well-being of community residents and revitalizing communities through the preservation of the nature and culture unique to the communities, e.g., rich watersides, starry skies, and soundscapes; achieving comprehensive water environment management that also contributes to biodiversity conservation and community building; developing a role model for the conservation of the entire watershed in which communities engaging in the creation of a good environment work together, targeting watershed ranging from forests and rivers as a source of water supply to the sea, while making use of the OECMs at the same time; and "satoumi" creation, an initiative in which people aim to build a virtuous circulation between the promotion of conservation, restoration, and creation of tidal flats, seaweed beds, and seagrass beds and the utilization of such tidal flats, etc. as local resources.

[iv] Response to issues seen across the environmental media of water, soil, and air

Nitrogen and plastic pollution, which the UN and other organizations have been discussing to address as international issues, as well as some kinds of nutrients, chemicals, and other matters are seen across various environmental media, e.g., water, soil, and air. To address this, we will manage this state from a viewpoint looking beyond the borders of environmental media and promote an integrated approach to this with decarbonization, resource recycling, and symbiosis with nature.

[v] Enhancement of scientific findings, development of human resources, and development and succession of technology

As an approach to addressing challenges in environmental administration involving water and air, Japan will enhance scientific findings, e.g., further collection and analysis of data, which is a basis for policy consideration and verification, and communication with researchers.

Against the backdrop of the aging and retiring of experienced staff and workers, Japan faces the urgent need for the succession of skills and know-how about monitoring, analysis, instruction, and other techniques that engineers have. In light of this, Japan will promote efficient environmental management using digital technology and encourage the development of human resources, e.g., young researchers, and the promotion of technology development and succession.

[vi] Promotion of international cooperation

Pollution of the water and air environment remains a serious problem in developing countries. Given that the water and air environments in Japan are closely linked to those in other countries, Japan will promote bilateral and multilateral cooperation, and through this, advance international cooperation and collaboration with developing countries, including those in the Asian region, to support them in designing systems for improving the water and air environments and provide them with technical assistance and capacity building. In addition, Japan will work on the conservation of water and air quality in cooperation with the international community through its contributions to the formation and implementation of multilateral environmental treaties and other frameworks.

(2) Chemicals management

Chemicals globally play an important role as an integral part of our everyday lives in the form of materials, articles, and products. According to the UN Environment Programme (UNEP), the size of the global chemical industry is estimated to double between 2017 and 2030. While chemicals are useful, they have also harmful aspects, and despite previous efforts by various international frameworks, chemicals continue to be discharged in large quantities. Some new issues have also been emerging, as seen in perfluorooctane sulfonic acid (PFOS), which has been newly added to the list of chemicals subject to control under the Stockholm Convention on Persistent Organic Pollutants. Recognizing the negative aspects of chemicals that have made our everyday lives convenient and affluent towards a sustainable society, we should place importance on tackling the development of safer chemicals and the reduction of their risks.

The triple crisis of pollution, climate change, and biodiversity loss is closely interrelated and need to be addressed in an integrated manner. From this perspective, the concept of "Planetary Health" has been proposed. The concept points out that human health must be viewed integrally with the earth's natural systems, based on the understanding that human health and civilization can be achieved based on the flourishing natural system and appropriate management of it. The concept also points out the increasing environmental loads resulting from normal business activities and general human activities in everyday lives, the possibility of changes in the behavior of persistent organic pollutants due to climate change, and the need for environmental impact assessment of the effects of mixtures of chemicals on the environment and human health. To address these issues, while businesses should take measures in accordance with regulatory and informational methods, individual citizens should also consider the deterioration of the

global environment in relation to their own health and take voluntary and proactive actions that contribute to the reduction of environmental loads. In this context, Japan should review measures for chemicals management so that such actions are paid off and incentives are given to those who engage in the actions.

In September 2023, the 5th session of the International Conference on Chemicals Management (ICCM5) adopted the Global Framework on Chemicals (GFC) that covers the perspectives above, too. The Bonn Declaration, adopted at the same time as the GFC, aims to secure accountability, transparency, and access to information on chemicals and the participation of all relevant stakeholders involved in the GFC, and requires stakeholders to promote behavioral change through voluntary and effective resource mobilization, not limited to regulatory approaches.

The GFC is an international agreement in which a wide range of stakeholders (e.g., governments, intergovernmental organizations, civil society, industry, and academia) in diverse fields (e.g., environment, economy, society, health, agriculture, and labor) participate, and each member country is required to achieve the objectives and targets of the GFC by formulating national implementation plans. Up to the Fifth Basic Environment Plan, Japan has been working on chemicals management from an international perspective in line with the Strategic Approach to International Chemicals Management (SAICM) agreed in 2006. Going forward, Japan will advance its chemicals management policies in accordance with well-organized Items [i] to [v] below as approaches contributing to the achievement of the five strategic objectives agreed to in the GFC.

[i] Legal frameworks, institutional mechanisms, and capacity building for management of chemicals throughout their life cycle

GFC Strategic objective A requires member countries to work on a legal framework, institutional mechanisms, and capacity building for chemicals management throughout their life cycle. Aiming to support and achieve safe and sustainable chemicals management, Japan, in addition to steadily enforcing relevant laws and regulations, will advance initiatives to support businesses in appropriately managing chemicals. With regard to international trade in chemicals and waste, it will fulfill its international obligations while working towards the international coordination of chemicals management. In addition, it will strive to thoroughly manage the risks of highly hazardous pesticides and take action accordingly.

[ii] Knowledge, data and information generated, available and accessible to all to enable

informed decisions and actions

GFC Strategic objective B calls for member countries to generate and make comprehensive and sufficient data and information on chemicals accessible in a usable form to enable informed decisions and actions. In response, Japan will strive to further promote the sharing of information on chemicals in materials and products throughout their life cycle, ranging from upstream to downstream and including the restoration stage. It will also endeavor to collect data on the manufacture of chemicals and the transfer and discharge of such substances, data on the concentration of chemicals in the human body and exposure sources, and monitoring data on the biota and environment, and endeavor to publish such data in an easily accessible format.

As an approach to helping diverse stakeholders to appropriately manage chemicals, Japan will work to develop guidelines, best practices, and standardization tools for hazard assessment, risk assessment, and waste management, and encourage the use thereof. Along with this, it will promote the formulation and implementation of educational, training, and awareness-raising programs concerning the safety and sustainability of chemicals, safe alternatives, and the social benefits of reducing the risks of chemicals and waste. Furthermore, it will continue to promote the use of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

It will also facilitate risk communication among diverse stakeholders (e.g., governments, intergovernmental organizations, civil society, industry, and academia).

[iii] Issues of concern to be addressed

GFC Strategic objective C calls for member counters to sequentially identify, prioritize, and address the issues of concern, and the Annex stipulates the procedures for doing so. Until the next ICCM session, member countries are required to continue to address new policy issues and other issues of concern that have been discussed at SAICM. Accordingly, Japan will continue to address these internationally discussed issues.

[iv] Safer alternatives and innovative and sustainable solutions in product value chains to prevent and minimize environment risks

GFC Strategic objective D requires member countries to develop safer alternatives and innovative and sustainable solutions in product value chains so as to maximize benefits to human health and the environment and prevent and minimize risks. In this context, the private sector worldwide is expected to: promote initiatives for and investment in advancing sustainable chemistry and resource efficiency, integrate strategies for the implementation of appropriate management into financial management and business models, and introduce international

reporting standards. In response, Japan will hold deliberations on measures for promoting these efforts as well as on policy methods to encourage production using safer alternatives and sustainable approaches.

At the same time, it will endeavor to: hold discussions on measures to prioritize sustainable solutions and safer alternatives in research and innovation, establish food systems in harmony with the environment, e.g., reducing the use of chemical pesticides and fertilizers, and carry out appropriate enforcement and awareness raising of relevant laws and regulations so as to encourage businesses to take note of the Chemical Substance Management Guidelines and properly manage chemicals.

[v] Enhanced implementation through effective resource mobilization, partnerships, cooperation, capacity-building, and integration into relevant decision-making processes

GFC Strategic objective E calls for member countries to: mainstream the sound management of chemicals and waste in relevant plans formulated by the government so as to enhance implementation through integration into relevant decision-making processes related to chemical management, and strengthen partnerships and networks so as to identify and internalize funds necessary for sound management, identify fund gaps, promote capacity building, and internalize the costs of the sound management.

Japan as well will work on the mainstreaming of the sound management of chemicals and waste, including such substances' positioning in the Plan, and will also hold deliberations on efforts that take advantage of synergies with measures against climate change, other major environmental policies, e.g., biodiversity conservation, health policies, and labor policies.

(3) Environmental health measures

Once people sustain health damage by pollution, it is extremely difficult or even impossible for them to regain their health. Accordingly, Japan should prevent such health damage in the first place or, if such damage unfortunately occurs, it should take steps to provide relief measures to victims as quickly as possible. This is the starting point for environmental administration, and it is the most important role that Japan should play. In light of this, proactive measures, including those given in Items (1) and (2) above, will be taken to prevent the occurrence of pollution-related health damage. Prompt and fair protection and securement of health for pollution victims will also be promoted.

We will strive to further enhance the measures for preventing heat illness to ensure that all stakeholders understand and put into practice heat illness prevention measures and are fully prepared for heat illness at all times.

[i] Pollution health damage compensation

Based on the "Act on Pollution Health Damage Compensation" (Act No. 111 of 1973; hereafter referred to as the "Act on Compensation") and giving consideration to the polluter-pays principle, Japan will implement compensation benefits and programs for pollution-related health and welfare for certified patients and provide prompt and fair relief to them.

[ii] Implementation of activities to prevent damage to health by environmental pollution

Making use of the profit from investment by the Pollution Health Damage Prevention Fund created by the Environmental Restoration and Conservation Agency, Japan will conduct necessary projects, such as research to prevent health damage due to air pollution and to ensure the health of community residents.

[iii] Environmental Health Surveillance Survey

Along with the 1987 Partial Revision of the Act on Compensation (De-listing of the Type 1 designated areas), Japan will conduct Environmental Health Surveillance Survey with the aim of regularly and continuously monitoring the relationship between the health conditions of community populations and air pollution and the aim of taking necessary measures as needed.

[iv] Promotion of measures against Minamata disease

Under the Act on Special Measures Concerning the Compensation of Minamata Disease (Act No. 81 of 2009), Japan, working with local governments and other entities, will advance measures against Minamata disease for compensation, medical and welfare measures, and community revitalization and reconciliation so that all victims and community residents can spend their everyday lives with peace of mind.

[v] Relief for asbestos health damage

In accordance with the "Act on Asbestos Health Damage Relief" (Act No.4 of 2006), prompt relief will be carried out for victims and others with health damage caused by asbestos. Moreover, based on the report compiled by the Asbestos Health Damage Relief Subcommittee of the Environmental Health Subcommittee of the Central Environment Council, in June 2023, we will take certain measures, e.g., for advancing surveys necessary for the operation of the Asbestos Health Damage Relief System and for further awareness raising of this system.

[vi] Heat illness prevention

Heat illness prevention is one of the most serious adaptation measures to climate change that directly affects the lives and livelihoods of all generations of citizens, and this covers a wide range of fields. In promoting and strengthening measures against heat illness, the national government, local governments, businesses, and other stakeholders should work together at all times to effectively raise public awareness and proactively publicize information on heat illness prevention measures and other actions and encourage all stakeholders to take heat illness prevention actions by making use of heat illness warning information as well as through "self-help" by individuals and "mutual assistance" among nearby people and community stakeholders. In addition, Japan will advance prevention measures for people vulnerable to heat illness, e.g., elderly people and children, and develop infrastructure through collaboration with industrial players, surveys, research, and other means.

Furthermore, if some risk of serious health hazards is expected due to significantly high temperatures, in addition to self-help and mutual-assistance, all stakeholders, including the national and local governments and businesses, should take measures to prevent heat illness flexibly and promptly, e.g., proactively conducting "public help" by administrative organs, including the utilization of Special Heat Stroke Alerts issued under the Climate Change Adaptation Act and Cooling Shelters designated under the Act.

Specifically, based on the "Heat Illness Prevention Action Plan" (cabinet decision on May 30, 2023), Japan will conduct measures placing the following eight pillars at the core.

- Public awareness raising and information provision to protect people's lives and health
- Heat illness prevention for people vulnerable to heat illness, e.g., elderly people and children
- Heat illness prevention in the places where personnel in change of management are present
- Heat illness prevention by local governments and community stakeholders concerned
- Collaboration with industrial players
- Promotion of research on heat illness countermeasures
- Preparedness for extreme high temperatures
- Announcement and public awareness raising of Special Heat Stroke Alerts and prompt implementation of countermeasures

5. Various basic measures

(1) Environmental impact assessment

As an approach to realizing a sustainable society, Japan will strive to incorporate environmental considerations in policies and plans from the stage of their formulation and will make use of environmental impact assessment, a system operated by collaboration and cooperation among the national government, local governments, and related associations, to establish environmental considerations among businesses, thereby securing the conservation of a healthy and productive environment and the realization of "well-being/high quality of life" for each and every citizen.

[i] Review of an ideal approach to the environmental impact assessment system

As ten years have passed since the full enforcement of the previous amendment[159] to the Environmental Impact Assessment Act, Japan will review the situation of enforcement of the amended Act in accordance with the Supplementary Provisions of the Act,[160] and conduct a comprehensive review of an ideal approach to the environmental impact assessment system to ensure more appropriate environmental considerations. For example, from the viewpoint of improving environmental information infrastructure, etc., the government will review the introduction of a system for continuous disclosure of drawings and documents of environmental impact assessment, taking legal issues into consideration. In addition, with regard to wind power generation business, which is expected to be introduced more widely in the future among renewable energy, Japan will promptly review an ideal approach to an appropriate environmental impact assessment system based on the characteristics of such business.

Deliberations on an ideal approach to the wind power generation business will focus on the following points, in particular:

- Among wind power generation business, in particular, offshore wind power generation business is expected to hold the key to making renewable energy the main source of power. On the other hand, the designation of the promotion zones for the development of marine renewable energy power generation facilities under the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities and the environmental impact assessment procedures under the Environmental Impact Assessment Act are independent and different systems. Accordingly, some issues have been

[159] As ten years passed after the "Environmental Impact Assessment Act" (Act No. 81 of 1997) was fully enforced in 1999, deliberations on the revision to the Act started and then the "Act on Partially Amending the Environmental Impact Assessment Act" (Act No. 27 of 2011; hereinafter referred to as the "Revised Act") was established in 2011 and fully enforced in 2013, which stipulates the procedure for preparing a document on primary environment impact consideration at an early stage and the procedure for preparing a report on measures for environmental conservation.

[160] Article 10 of the Supplementary Provisions of the Revised Act stipulates that "When ten years have elapsed since the enforcement of this Act, the national government is to review the situation of enforcement of this Act, and take necessary measures based on the results of the relevant review."

pointed out due to the parallel application of the two systems. To address this, Japan will promote efforts for building a system in which these two Acts are appropriately connected.[161]

- As for onshore wind power generation business, from the perspective of promoting the regional symbiosis based society while ensuring appropriate environmental considerations, the government will hold deliberations on the development of a new system that enables efficient and effective environmental impact assessments based on the environmental characteristics of communities, including screening according to the degree of environmental impact.

[ii] Deployment of initiatives that contribute to the implementation of a quality and appropriate environmental impact assessment system

In order to properly implement the environmental impact assessment system under the Environmental Impact Assessment Act, Japan will mainly advance the following efforts.

- Development of a platform of information necessary for environmental impact assessments, e.g., basic environmental information and information on the case examples of such assessments conducted in the past
- Research and development and awareness raising of the latest technical methods for environmental impact assessments
- Fostering of external specialist human resources for environmental impact assessments
- Enhancement of the examination system and other schemes for environmental impact assessment procedures
- Implementation of follow-up efforts involving environmental impact assessments by making use of the procedures for preparing a report

(2) Promotion of research and development as a basis of policy decisions based on scientific findings

[i] Development of systems for conducting environmental research and technological development

Japan will take on the development of foundations by conducting the following efforts: implementing research and development that contributes to environmental policy, centered on a competitive research fund called "Environment Research and Technology Development Fund"; strengthening the functions of the National Institute for Environmental Studies, a core institution for environmental research, to maximize the results of research and development; enhancing the role of communities as an environmental research base; developing basic

[161] See footnote 137.

information that contributes to research, technology development, and policy making in the field of the environment; enhancing cooperation between local governments and environmental research institutions; and developing human resources by enhancing training programs at the National Environmental Research and Training Institute.

In addition, Japan will enhance its support for research and development by private companies, universities, local governments, and other entities that play a leading role in research and development, and at the same time, it will vitalize academic research to strengthen science, which forms the basis for policy decisions based on scientific findings across the boundaries of environmental industries, humanities, social sciences, and natural sciences, including support for seamless environment startups that take on the overcoming of innovator's dilemma. It also will strive to systematically understand and organize the implementation status of research and development by the industry, academia, and government sectors and share this information with society.

Aiming at the development, demonstration, and social implementation of science, technology, and innovation to support "new avenues for growth," Japan will newly formulate a Promotion Strategy for Environmental Research and Environmental Technology Development based on the Plan, taking into account the latest trends shown in the "Science, Technology, and Innovation Basic Plan" (cabinet decision on March 26, 2021) and other policies. The Ministry of the Environment, other relevant ministries and agencies, local governments, universities and other research institutions, private companies, and other entities should promote research and technology development in the field of the environment by taking into consideration the contents of the strategy above. In addition, it will revise the mid- to long-term goals of the National Institute for Environmental Studies, a core institution for environmental research, based on the strategy. Furthermore, under the Environment Research and Technology Development Fund program, Japan will steadily implement environmental research and environmental technology development by showing its environmental administrative needs that will contribute to solving the issues in research and technology development that the country should tackle by priority in the field of the environment over the coming five years or so (priority issues), which are the issues defined in the strategy above. It will also contribute to and reflect the results of the research and technology development in environmental policies through the allocation and prioritization of funds by ERCA.

Furthermore, it will strategically advance research, technology development, demonstration, and social implementation in the field of the environment in accordance with government-wide

trends, e.g., those in the Integrated Innovation Strategy Promotion Council.

[ii] Promotion of research and development serving as a foundation for policy decisions based on scientific findings

We will promote the accumulation of scientific findings and the development of basic information in order to make policy decisions based on scientific findings and promote the policies. For example, the National Institute for Environmental Studies will develop and operate a global environmental database as an intellectual research platform for efficiently managing and broadly providing and disseminating data collected through various studies on global environmental issues, including global environmental monitoring. In addition, with regard to climate change adaptation, we will continue to work to acquire scientific findings through collaboration and joint research with the Local Climate Change Adaptation Centers and other domestic and overseas research institutions, and will develop and improve databases to promote climate change adaptation, thereby contributing to the social implementation of climate change adaptation measures. ERCA will steadily advance the accumulation of scientific findings, research, and technology development under the Environment Research and Technology Development Fund program and will improve and enhance its websites, events, and other means, thereby effectively disseminating its achievements for social implementation, including contributions to environmental policies.

(3) Promotion of environmental education, ESD and collaborative efforts

In accordance with the Act on the Promotion of Environmental Conservation Activities through Environmental Education and the basic policy that the government stipulates under the Act, we will promote environmental education, education for sustainable development or ESD (hereafter referred to as "environmental education, etc."), and collaborative efforts with the aim of encouraging all grown-ups and children to interlock personal changes with social and organizational changes on all occasions. In particular, we will tackle the following points by priority.

[i] Promotion of environmental education and ESD in schools

Environmental education in schools, etc. is important from the viewpoint of helping children and students, including infants, and children and students with disabilities, to learn systematically and continuously according to their stage of development, and the viewpoint of providing equal opportunities to them regardless of economic disparities. Aiming to foster children and students with the qualities and abilities that are necessary for becoming "creators

of a sustainable society" as specified in the National Curriculum Standard for Kindergartens, the National Curriculum Standard for Elementary Schools or Junior High Schools, and the National Curriculum Standard for High Schools as well as in the Fourth Basic Plan for the Promotion of Education, schools should place importance on realizing "curriculum management" and promoting "in-depth learning through proactive efforts and dialogue (active learning)" and, from this viewpoint, they should endeavor to improve classes. In addition, from the perspective of the Whole School Approach, Japan will position UNESCO Associated Schools as a base for promoting ESD, facilitate opportunities for children and students to put ESD into practice in collaboration with various stakeholders, and enhance exchange among UNESCO Associated Schools by utilizing the network among the schools. In addition, aiming to encourage school facilities, which serve as a place for children and students to learn and spend their everyday lives, to be utilized as a teaching material for environmental education, Japan will promote the development of environmentally friendly school facilities (eco-schools).

In addition, as an approach to improving the quality and effectiveness of education in parallel with reducing the burden on teachers and other staff, we will endeavor to further enhance organizations and other bodies with intermediary supporting functions, e.g. ESD Resource Center of Japan, to promote learning in collaboration with social education facilities, community associations, businesses, and other organizations.

[ii] Promotion of environmental education taking a wide variety of opportunities, including communities

Japan considers it important for people to seamlessly learn about the environment whenever they want to in a variety of life stages from infancy to old age by taking certain opportunities, e.g., communities and home. To achieve this, it should expand effective learning opportunities, e.g., environmental education. For this purpose, related ministries and agencies will work together to expand opportunities for people to participate in nature experience-based activities and other hands-on activities. Moreover, proactively leveraging a program of the Certification of "Places for Nature-Based Experiences" and a program for designating Supporting Organizations of Environmental Education under the Act on the Promotion of Environmental Conservation Activities through Environmental Education, Japan will collaborate with ESD Resource Center of Japan, local governments, private organizations, companies, and other entities to further improve environmental education and other related activities. In addition, it will promote efforts to train environmental leaders inside and outside companies with a view to appropriately integrating environmental considerations into corporate management, and to generate new corporate value. Such environmental leaders are expected to have the capacity to

tackle environmental management and environmental conservation, thereby promoting the greening of the economy and society.

In response to climate change, which is becoming increasingly serious, citizens should work together to change their behavior and take on efforts to change organizations and society, which will lead to realizing a decarbonized society. To achieve this, we will proactively disseminate information, raise public awareness, and promote environmental education and other occasions.

Furthermore, in order to halt biodiversity loss and achieve social change, it is essential to increase people's knowledge and interest in the importance of biodiversity and other facts and to change their behavior. Accordingly, we will facilitate environmental education, including biodiversity, in communities, households, schools, and other places, and will also promote the development of human resources to support this action.

[iii] Promotion of collaborative efforts through dialogues toward the creation of sustainable communities

In order to promote collaborative efforts through dialogue among residents, private organizations, businesses, and administrative organs to build sustainable communities, we will take advantage of the Global Environment Outreach Centre and Environment Partnership Offices as a base and will take on the following efforts: introducing advanced case studies, holding opinion-exchange meetings to promote collaboration among various stakeholders, strengthening the policy-making function of private organizations and other entities, and providing mentoring and other support for independent community building. In addition, as an approach to demonstrate more intermediary supporting functions in communities, we will share its findings and experience involving intermediary supporting functions with various organizations and associations in communities as well as identify and foster human resources and organizations that can assume intermediary supporting functions, thereby promoting community building through collaborative efforts that match the characteristics of the communities and promoting the creation of a Circular and Ecological Economy. Furthermore, we will focus on young people, who are important players in change toward the creation of a sustainable society, and will support them in enhancing their activities and accessing opportunities to participate in dialogue and collaborative efforts, while also taking measures to ensure that the opinions of young people are actively incorporated into policy formation with due consideration given to intergenerational equity.

[iv] Provision of support for achieving a just transition to realize a sustainable society

As a pathway to realize a sustainable society, we should work toward Integrated Improvements on Environment, Economy and Society (II2ES) from a wide range of perspectives, e.g., harmony with industries in communities, maintaining and improving the stability and welfare of residents' everyday lives in communities, and taking into consideration the succession of the culture and history of environmental conservation in communities.

In addition, from the viewpoint of a just transition, the appropriate advancement of labor mobility to newly emerging industries should be made. As support measures for investment in people, Japan will provide support, e.g., for smooth labor mobility to growth fields and other areas and for the career change of current workers for better careers. Through these efforts, Japan will succeed in both the acquisition of new skills and smooth labor mobility to growth fields at the same time, thereby encouraging a just transition.

(4) Improvement and provision of environmental information and enhancement of PR activities

[i] Improvement of environmental information to promote EBPM

As mentioned in Part 1, Chapter 2, 3(3), the coevolution of governments (e.g., national government and local governments), markets (e.g., companies), and citizens (including civil society and communities) requires the enhancement and disclosure of environmental information, which serves as the foundation of the coevolution. For this reason, as described in the respective priority strategies in Part 2, Chapter 2, we will focus on the environmental information, e.g., on corporate management and activities (e.g., financial information related to climate change and nature, and GHG emissions throughout the supply chain) and on community building plans and land use (e.g., information on the potential for an introduction of renewable energy and that on ecosystem) and develop the information to make it visible and available to all stakeholders. In addition to this environmental information, we will also focus on environment-related statistical information and steadily develop statistical data necessary for policy making in environmental administration so that the data will contribute to the evidence-based policy making (EBPM) approach in accordance with such policies as the "Final Report of the Statistical Reform Promotion Council" (decided by the Statistical Reform Promotion Council on May 19, 2009) and the "Basic Plan Concerning the Development of Official Statistics" (cabinet decision on March 28, 2023). Moreover, we will steadily improve and enhance statistical data from the standpoint of statistical users to make them more accessible and convenient for them.

[ii] Promotion of information provision in response to user needs

In order to promote the mutual use of public and private data held by the national government, local governments, businesses, and other entities, Japan will strengthen its open data initiatives regarding environmental information based on certain policies, e.g., the "Open Data Basic Guidelines" (decided on May 30, 2009, and revised on June 15, 2021, by the Public-Private Data Utilization Strategy Council of the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society). It also places importance on the enhancement and strengthening of partnerships among various stakeholders to encourage citizens to participate in environmental policies and shift to sustainable lifestyles. For this purpose, it will further provide environmental information that users can access when needed and smoothly understand whenever and wherever they want in parallel with securing the reliability and accuracy of such information and utilize digital technologies, e.g., SNS and AI. In addition, it will provide information on decarbonized products and services to encourage consumers to change their behavior by taking advantage of the "DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization)" campaign.

[iii] Policymaking based on the best available objective evidence

As a ground for policy making, it is desirable to refer to objective evidence, e.g., scientific findings with a solid cause-and-effect relationship obtained by robust methods for effectiveness verification, e.g., randomized controlled trials. In preparing and providing the environmental information above, Japan must pay attention to the quality of evidence (levels of evidence). Meanwhile, as we do not always find high-quality evidence, we should consider the conditions under which given evidence has been discovered, the internal and external validity of the evidence, and other factors, while taking into account the best available evidence at the time, and should make policies based on the "precautionary approach."

6. Reconstruction and creation efforts following the Great East Japan Earthquake, and preparation for future large-scale disasters and responses when such disasters occur

(1) Reconstruction and recovery after the Great East Japan Earthquake

[i] Development of the Specified Living Areas for Returnees in Restricted Areas

With regard to the Specified Living Areas for Returnees under the Act on Special Measures for the Reconstruction and Revitalization of Fukushima (Act No. 25 of 2012), which was revised in June 2023, Japan will aim to lift the evacuation orders from all of the areas over the course of the 2020s and return residents to the areas. In accordance with the Reconstruction and

Revitalization Plans for the Specified Living Areas for Returnees, which have been filed by municipalities and approved by the Prime Minister, it will advance the decontamination and dismantling of buildings in the Specified Living Areas for Returnees in Restricted Areas in tandem with infrastructure development there.

[ii] Environmental regeneration efforts in the affected areas

Japan has been making steady progress in the development of interim storage facilities (i.e., facilities to safely manage and store soil and waste removed by decontamination work in Fukushima Prefecture until final disposal), the continuous transportation of the removed soil and waste to these facilities, the storage of the removed soil and waste, and the treatment of radioactive materials and radioactive wastes. The government will continue to collaborate with local governments and other stakeholders and, at the same time, it will work in unison to take necessary measures for the prompt and appropriate implementation of this project.

[iii] Fostering understanding and developing technology toward final disposal outside Fukushima Prefecture and recycling of the removed soil and waste

Concerning the final disposal of removed soil and waste in Fukushima Prefecture, the Japan Environmental Storage & Safety Corporation Act (Act No. 44 of 2003) stipulates that "necessary measures should be taken to complete final disposal outside Fukushima Prefecture within 30 years after the start of interim storage." Taking into full consideration the backdrop of the difficult decision made by the local governments to accept interim storage facilities, and under this provision of the Act, the national government will take responsibility for taking on this project. In addition, we place importance on uniting the government's efforts to reduce the volume of removed soil and waste and advance the recycling of removed soil with the understanding of the people so as to reduce the final disposal volume. For this purpose, it will develop and demonstrate volume reduction technology and also will promote nation-wide activities to foster public understanding of the safety and other aspects of these efforts, including the conveyance of easy-to-understand information in accordance with the "Technology Development Strategy for Volume Reduction & Recycling of the Removed Soil and Waste under Interim Storage" and the "Process Chart." Regarding the development of destinations for removed soil and waste recycling, the government working together as one will promote initiatives toward the establishment of a system by strengthening cooperation among related ministries and agencies, etc., and promote concrete measures while gaining the understanding of local communities. In addition, Japan will advance deliberations on and coordination of research for final disposal outside of Fukushima Prefecture.

[iv] Future-oriented initiatives

We will also contribute to the reconstruction of Fukushima through environmental measures, e.g., decarbonization, resource circulation, and symbiosis with nature, and, with stakeholders, we will vigorously promote future-oriented initiatives to create and rediscover the value of the communities in a manner that meets the needs of local residents. Specifically, we will promote certain initiatives, e.g., for the introduction of decentralized and self-reliant energy systems in Fukushima Prefecture and for the realization of decarbonization and town planning for reconstruction at the same time.

[v] Sea area monitoring regarding ALPS treated water

In August 2023, Japan started the discharge of contaminated water treated by the multi-nuclide removal equipment (Advanced Liquid Processing System: ALPS) and other equipment at TEPCO's Fukushima Daiichi Nuclear Power Station into the sea. It will steadily implement the fully objective, transparent, and reliable monitoring of the sea area to ascertain the situation inside the environment and control the adverse impact of harmful rumors as an effort in accordance with the "Basic Policy on Handling of ALPS treated water at the Tokyo Electric Power Company Holdings' Fukushima Daiichi Nuclear Power Station" (decided by the Inter-Ministerial Council for Contaminated Water, Treated Water and Decommissioning Issues on April 13, 2021).

[vi] Health management and response to health concerns of residents regarding radiation exposure through risk communication

As we have been advancing efforts for the care of residents' health management and their health concerns involving radiation resulting from the nuclear disaster, we will continue to conduct the following efforts: ascertaining and assessing radiation exposure doses; conducting research on the effects of radiation on people's health; conducting the Fukushima Health Management Survey and supporting the survey subjects; and providing support by the Radiation Risk Communication Counselor Support Centers. We will also proactively convey information to eliminate discrimination arising from misunderstandings about the effects of radiation on people's health. In particular, against the backdrop that the evacuation orders were lifted from the Specified Reconstruction and Revitalization Base Areas and, in response, the number of people who have returned to the areas is increasing, we will advance collaboration with the efforts voluntarily undertaken by people who have returned to the areas and propel efforts to leverage the opinions of participants obtained through dialogues in future measures for addressing people's health concerns from radiation.

(2) Response to natural disasters

[i] Disaster waste treatment

In recent years, Japan has been experiencing large-scale disasters almost every year. Some of these disasters cause damage to waste treatment facilities and make dysfunctional the treatment of garbage and human waste as well as large amounts of disaster waste, resulting in a serious challenge to society. For example, even limited to the disasters designated as Specified Extraordinary Disasters[162] that have occurred after the formulation of the Fourth Fundamental Plan for Establishing a Sound Material-Cycle Society, Japan experienced such disasters as the Heavy Rain Event of July 2018, Typhoon No.19 in 2019 (Hagibis), the Heavy Rain Event of July 2020, and the Noto Peninsula Earthquake 2024. Large-scale disasters are expected to occur in the future as well, and from the viewpoint of national resilience, we should make preparations during normal times for building a resilient system for disaster waste treatment.

See Item 2(4) of this chapter for specific efforts.

[ii] Environmental conservation measures, etc. in disaster-hit areas

We will thoroughly raise public awareness of preventing asbestos from scattering in the event of a disaster, including ascertaining buildings in which asbestos are used and warning residents and people in nearby areas about the buildings during normal times and conducting emergency measures and environmental monitoring in the event of disasters.

In addition, we will provide information on countermeasures against pests and malodors associated with disaster waste as well as measures to cope with malodors at temporary toilets at evacuation shelters. Experts will be dispatched on an as-needed basis to provide guidance and advice by pinpointing causes of malodors, and ways and means to control these matters.

Moreover, in line with the Disaster Preparedness Guideline for Humans and Pets, we will call on local governments, pet owners, and others to be prepared during normal times, and in the event of disasters, we will work with local governments and other organizations to support the acceptance of pets at evacuation centers and the development of an emergency system for temporary caring of affected pets.

In the summer, as the risk of heat illness increases for disaster victims, volunteers, and other

[162] The "Specified Extraordinary Disaster" refers to an extraordinary disaster of an extremely unusual or devastating nature as defined in Article 2, Paragraph 1 of the Act Regarding Special Measures to Weigh the Preservation of Rights and Profits of the Victims of Specified Extraordinary Disasters (Act No. 85 of 1996).

staff, the government will strive to issue a heat illness warning.

Part 3 System of environmental conservation measures

Measures on environmental conservation must be promoted comprehensively and systematically by working closely with different stakeholders, and for this purpose, it is necessary to clarify the overall picture of environmental conservation measures. Therefore, various measures regarding each area of environmental issues, various basic measures, and measures regarding international efforts, in addition to those shown in priority strategies, are systematically organized as follows.

Some parts of this system overlap with the priority strategies and the priority measures in each area.

Chapter 1. Measures regarding each area of environmental issues

1. Conservation of global environment

(1) Global warming countermeasures

(i) Measures and countermeasures for the enhancement of scientific findings

Implementation of countermeasures based on the latest scientific findings will be essential for resolving the issue of climate change. Scientific findings provided by various reports from IPCC have been contributing greatly to countermeasures against climate change throughout the world. By supporting these activities through contributions and other means, as well as by supporting research implemented by domestic scientists, Japan's scientific findings will be reflected in the IPCC reports.

We will continuously observe global greenhouse gas concentrations with the Greenhouse Gases Observing Satellites "IBUKI" (GOSAT) and "IBUKI-2" (GOSAT-2), maintain a continuous observation system with the Global Observing Satellite for Greenhouse gases and Water cycle (GOSAT-GW), which is the third satellite scheduled to be launched in FY2024, and consider its successor satellite. In addition, observations of global environmental changes associated with climate change will be conducted using the Global Change Observation Mission - Climate "SHIKISAI" (GCOM-C) and other satellites. Furthermore, enhancement of scientific findings related to climate change will be promoted through observation, monitoring, forecasting, impact assessment, and research and study using aircraft, ships, and ground-based observation. In addition, the

GHG inventory reports prepared and published by each country under the Paris Agreement will be compared with emissions estimates based on highly independent GOSAT observation data, aiming to ensure transparency in emissions reports from each country and to realize the international standardization of emissions estimation technology.

(ii) Presenting a vision for decarbonized society aiming to realize a sustainable society

As part of Japan's efforts to achieve the 1.5°C target, in accordance with the Plan for Global Warming Countermeasures, we aim to reduce greenhouse gas emissions by 46% in FY2030 from the FY2013 level, in addition to achieving net-zero by 2050, and to continue efforts in our challenge to meet the lofty goal of cutting its emission by 50%. In order to create a virtuous circulation between the economy and the environment, and to grow strongly toward the ambitious target for FY2030, we will promote all possible efforts in every area, including the thorough promotion of energy conservation, maximum introduction of renewable energy, and the decarbonization of the public sector and regions.

(iii) Towards the realization of green transformation (GX)

Based on the GX Promotion Act and the GX Promotion Strategy based on the Act, we will accelerate GX in Japan by promoting GX investment in focused fields through investment strategy set for each field, while combining support for upfront investment through GX Economy Transition Bonds and upfront GX investment incentives through a Pro-Growth Carbon Pricing Concept, in order to realize a Green Transformation (GX) that will shift the industrial and social structure that has been fossil energy-centric since the Industrial Revolution to a clean energy-centric structure.

(iv) Measures to reduce energy-originated CO2 emissions

We will implement initiatives such as the promotion of thorough energy conservation, maximum introduction of renewable energy, decarbonization of the public sector and regions, further acceleration and social implementation of technology development, and lifestyle and workstyle reform, in order to promote the reduction of GHG emissions while ensuring the realization of economic development and high-quality citizens' life, regional revitalization, and harmony with nature.

A. Creating decarbonized, resilient and comfortable communities and lifestyles

Based on the Regional decarbonization roadmap, Plan for Global Warming

Countermeasures, and GX Promotion Strategy, we will promote the creation of Decarbonization Leading Areas and the nationwide implementation of priority measures as a foundation for decarbonization, as well as provide active support for the establishment of regional implementation systems. Refer to the Part 3, Chapter 2, Section 4 (1) (ii) for specific measures.

With regard to DECOKATSU (National Movement for New and Prosperous Lifestyles toward Decarbonization), based on the "10-year roadmap of lifestyles" formulated in FY2023, we will create large-scale demand for decarbonization-oriented products and services, and promote behavioral change and lifestyle shift towards the Newly Prosperous Lifestyles in a sustainable and powerful manner through cooperation between the public and private sectors.

In order to realize a decarbonized society, it is necessary to steadily promote the mainstreaming of renewable energy. For the maximum introduction of renewable energy, we will promote renewable energy in harmony with local communities by giving proper environmental considerations and building consensus in the community. In addition, measures to reduce CO2 emissions will be promoted through various initiatives, including the creation of demand by taking the lead in introducing renewable energy in public facilities, the introduction of solar power for self consumption in the private sector, the expansion of energy use over a wide area, and the introduction of solar power generation facility integrated with walls and windows.

Also, ZEH and ZEB will be diffused to steadily promote decarbonization in the residential and building sectors, which, once constructed, have a long-term impact on CO2 emissions. In addition, while accelerating the decarbonization of houses and buildings with low energy efficiency that exists in large numbers in Japan, thorough energy management will be implemented through measures such as promoting the introduction of equipment and devices with high energy efficiency, utilizing energy management systems (HEMS/BEMS/FEMS) in houses, buildings, and factories, and implementing energy efficiency and conservation audits.

We will further improve the energy-saving performance of household appliances, automobiles, and construction materials through the leading runner approach under the Energy Conservation Act.

In the electric power sector, in addition to maximizing the use of decarbonated power sources, we will steadily fade out inefficient coal-fired thermal power generation toward 2030 in order to reduce the ratio of thermal power generation as much as possible on the basic premise of securing stable power supply. In addition, efforts will be promoted to replace thermal power generation with decarbonization-oriented thermal power generation by 2050, through the use of hydrogen, ammonia, CCUS/carbon recycling, etc.

B. Promotion of shift to decarbonization throughout the value chain/supply chain

We will promote the decarbonization of the entire supply chain, including the implementation of the decarbonated management of corporate value chain by also utilizing private investment, logistics and transportation to support regional communities and lifestyles, and resource circulation.

Voluntary efforts in industry will be promoted through the steady implementation, evaluation, and verification of the Keidanren Carbon Neutrality Action Plan.

We will also support the decarbonization of companies by providing assistance in the formulation of reduction plans and the introduction of equipment with high energy conservation performance in factories and offices.

In order to realize a net-zero society, it is important to make reduction efforts not only by the company itself but also throughout the value chain, and promoting such efforts will lead to strengthening the competitiveness of the company. Therefore, we will promote the development of an environment for calculating greenhouse gas emissions in the value chain, as well as supporting the calculation and reduction of greenhouse gas emissions.

C. Demonstration of leading technologies and development of information infrastructure as a basis for the decarbonization of communities and lifestyles

It is important to solve technological issues to realize the improvement of efficiency and the reduction of cost pertaining to CO2 emission reduction technologies, and to create superior CO2 emission reduction technologies and disseminate them in the real world, which will lead to enhanced global warming countermeasures in the future. For this purpose, we will promote the development and demonstration of technologies with high CO2 emission reduction effects, which cannot be sufficiently advanced only through voluntary efforts by the private sector due to development risks and other issues.

We will develop and demonstrate innovative and resource-saving catalyst technologies that enable the utilization and circulation of local resources such as waste plastic and unused agricultural biomass, as well as a significant reduction in CO2.

Aiming to realize the social implementation of next-generation energy, a demonstration will be conducted to build a supply chain of local production for local consumption, where hydrogen produced with local resources is consumed locally.

In order to realize the early social implementation of CCUS/carbon recycling, we will work on the establishment of an integrated technology from CO2 separation and recovery to transport and storage, and a demonstration project to generate chemical feedstock by using CO2 from exhaust gas emitted from waste treatment facilities.

D. Decarbonization of mobility

We will promote initiatives for the greening of road traffic, such as the introduction of electrified vehicles and the development of recharging and hydrogen refueling infrastructures. Also, while recognizing the possibility of the occurrence of so-called induced/diversion traffic, it is necessary to take initiatives to optimize road traffic, such as strengthening the trunk road network as a congestion countermeasure to reduce CO2 emissions in the relevant zone due to congestion,[164] as well as to reduce CO2 emissions throughout the life cycle of road maintenance and management, etc., to promote the decarbonization of road facilities. Further, efforts will be made to promote the diffusion of next-generation technologies for mobility in general, while encouraging the development and performance thereof, such as supporting the development and introduction of zero-emission ships and other vessels and the construction of production infrastructure thereof, and the development and introduction of hydrogen fuel cell railcars.

In addition, we will work to promote the use of public transportation, including railroads, and modal shifts in cargo transport, in order to encourage the use of relatively low-carbon

[164] Regarding efforts to optimize road traffic, from the perspective of environment conservation, it is important to determine the effect of reducing environmental loads such as CO2 emissions (including the efficient use of decarbonated power sources and fuels)in a comprehensive manner, by taking into account the impact of so-called induced/diversion traffic (e.g., increase in the number of trips by car, change in destination, shift from railroads, etc., and impact associated with medium- to long-term land use changes) associated with the expansion of convenience of automobiles, as well as changes in driving characteristics associated with the spread of electric vehicles.

transport modes.[165]

(v) Measures to control non-energy-originated CO2 emissions

For the reduction of the emissions of CO2 from non-energy, methane, dinitrogen monoxide, and CFC substitutes, etc., individual measures such as waste disposal and the spread of non-CFC products will be promoted. We will move to reduce emissions of fluorocarbons, by comprehensive measures throughout the lifecycle of fluorocarbons from upstream to downstream (production, use, recovery, and destruction/recycle), in consideration of the Kigali Amendment to the Montreal Protocol.

(vi) Removal measures such as forests and the utilization of biomass, etc.

As removal measures such as forests, the circulation of forest resources is established through comprehensive efforts such as reforestation of elite trees, etc., development of human resources engaged in forest activities and forestry, development of production infrastructure, and the expansion of the use of wood for buildings, etc., as well as promoting appropriate management of agricultural land, etc., and urban greening.

In order to steadily implement these measures, they are promoted in an integrated manner with the revitalization of farming and fishing villages through the use of biomass and other resources.

Furthermore, efforts utilizing the carbon stored in marine ecosystems such as seagrass meadows and macroalgal beds and tidal flats (blue carbon) have multifaceted values, including the removal and fixation of CO2, conservation of the marine environment and fishery resources, tourism, and the development of local economies, and symbolize the integrated promotion of the three elements of net-zero, circular economy, and nature-positive economies. Thus, we will actively promote initiatives for the maintenance and expansion of blue carbon ecosystems (mangrove forests, tidal marshes, seagrass meadows, macroalgal beds) and the consideration of removal measures. With regard to the calculation of CO2 emissions and removals of blue carbon ecosystems, which have a different carbon storage mechanism, we will establish a more accurate calculation method for the distribution area of macroalgal beds in Japan's coastal areas, and promptly reflect the results in greenhouse gas inventories, starting with those that are possible, while

[165] CO2 emissions per transport volume are: about 22% of those of private passenger cars (excluding electric cars) by rail for passengers, about 9% of those of commercial cargo vehicles by rail, and about 20% of those of commercial cargo vehicles by ship (FY2021).

taking into account the IPCC Guidelines.

(vii) Contribution to international global warming countermeasures

Based on the results of the global stocktake conducted at COP28, Japan will make its utmost contribution to ensure that the global path forward will be consistent with the 1.5°C goal.

Specifically, based on collaboration with partner countries, we will further improve the environment for the creation of markets where decarbonization is highly valued through strategy formulation, institution building, human resource development, etc., taking advantage of Japan's technological strengths, and promote business-led international deployment of technologies and products as well as making utmost contribution to the global reduction of emissions and sustainable growth, with high environmental performance by utilizing the Joint Crediting Mechanism (JCM), which is implemented in line with the Paris Agreement, in a wide range of sectors, including agriculture, etc. Further, while cooperating with various international initiatives to promote climate change countermeasures in which Japan participates, such as the Global Methane Pledge, we will cooperate with decarbonization efforts in developing countries by utilizing the Joint Crediting Mechanism (JCM), the City-to-City Collaboration Program, and other means.

Greenhouse gas emissions from changes in land use account for 20% of the world's total emissions, and reducing these emissions is an important issue in the global warming countermeasures. Therefore, we will actively promote reducing emissions by reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) and afforestation especially in developing countries, thereby contributing in reducing emissions and ensuring absorption in the forest sector. Also in the adaptation sector, in order to promote adaptation activities in each country, development of a base for scientific information and knowledge base, development of support tools, capacity building, and human resource development will be implemented in the AP-PLAT (Asia-Pacific Climate Change Adaptation Platform), and such activities will be publicized.

(viii) Cross-sectoral measures

In order to promote the decarbonization of Small and Medium-sized Enterprises (SMEs),

which constitute the value chain that is the strength of Japan's industrial competitiveness, local governments, financial institutions, and economic organizations in each region will work together to build a region-wide support system and promote initiatives along the three steps of "learning," "accounting," and "reducing".

With regard to the GHG emissions accounting, reporting, and publicizing system as stipulated in the Act on Promotion of Global Warming Countermeasures, we will consider revising the system so that it will also promote the reduction throughout the value chain and new initiatives such as CCUS/carbon recycling and absorption, and so on. In addition, we will establish an environment to facilitate the calculation and publication of emissions by SMEs, which have no reporting obligation, e.g., by expanding the Energy Efficiency and Global Warming Countermeasures online reporting System (EEGS).

In order to provide information necessary for consumers to select products and services that contribute to the realization of decarbonization, we support efforts by businesses and industries to calculate and indicate the CFP (carbon footprint of product: greenhouse gas emissions considering the entire life cycle of products and services) of their products and services through model projects and so on. At the same time, we will examine effective labeling that contributes to consumers' choice and promote labeling based on uniform standards. Further, from the viewpoint of visualizing the effects of reductions in environmental loads such as reduction in CO2 emissions and converting them into added values, the provision of green products utilizing the mass balance method is also considered to be an effective approach, and will be studied for dissemination in the future.

The utilization of the Guidelines for Greenhouse Gas Emission Reduction, based on the Act on Promotion of Global Warming Countermeasures and that summarizes the measures to be taken by business operators, should be promoted through the expansion of the menu of measures in response to technological advances, and changes in the circumstances of other surrounding business activities should be considered, while also improving its convenience.

(ix) Efforts in Public Organizations

A. National Government Action Plan

Based on the "Plan for measures for the reduction, etc. of the amount of greenhouse gas emissions (National Government Action Plan)," the cabinet decision in October 2021, the government has set a target of 50% reduction of greenhouse gas emissions

by the entire government by FY2030 compared to the FY 2013 level, and will take initiative in implementing measures such as the introduction of solar power generation, introduction of ZEB in newly constructed buildings, introduction of electrified vehicles, introduction of LED lightings, and the procurement of renewable energy electricity (electricity with the lowest possible emission factor even for the part that exceeds the target of 60%).

B. Local Government Action Plans

Based on the Act on Promotion of Global Warming Countermeasures, all local governments are required to formulate Local Government Action Plans (for Office Work) regarding the reduction of greenhouse gas emissions generated from their own office work and projects. Prefectures, designated cities, core cities, and special ordinance cities at the time of enforcement (hereinafter referred to as "prefectures, etc." in this paragraph) are required to formulate Local Government Action Plans (for area measures) as a comprehensive plan to promote greenhouse gas emissions reductions in accordance with the natural and social conditions of their respective areas. Municipalities other than prefectures, etc. should make efforts to formulate said plans. See Part 3, Chapter 2, Section 4 (1) (ii) for the specific direction of efforts.

(2) Promotion of adaptation to the impact of climate change

In order to cope with the effects of climate change that are becoming apparent in Japan and abroad, such as extremely heavy rainfall and extreme heat, there is an increasing need to promote not only "mitigation" measures, such as reducing greenhouse gas emissions, but also "adaptation" measures to avoid or reduce damage by addressing the impacts of climate change that have already appeared, or are unavoidable in the medium to long term. The impact of climate change may occur in various aspects, including agriculture, forestry, fisheries, water environment, water resources, natural ecosystems, natural disasters, and health, so it is important to promote coordinated efforts in all areas.

To this end, based on the Climate Change Adaptation Act and Adaptation Plans, we will promote the enhancement of scientific findings and assessment of the impact of climate change, incorporation of climate change adaptation to the measures implemented by relevant government ministries and agencies, and international cooperation. Regarding heat illness countermeasures in particular, the government will promote initiatives related to heat illness countermeasures in cooperation with relevant ministries and agencies, in

accordance with the Heat illness Prevention Action Plan, and work on the dissemination of heat illness countermeasures among the public through local governments and private organizations, etc. Agriculture, forestry, and fisheries industry is one of the industries most vulnerable to the impact of climate change. Here, a wide range of measures will be promoted based on the MAFF Climate Change Adaptation plan, which was revised based on the MIDORI Strategy, the strategy for sustainable food systems.

In addition, by collecting, streamlining, and analyzing various findings on climate change impacts and adaptation, and providing information on climate change impacts and adaptation measures to local governments, businesses, citizens, and other entities, we will support the enhancement of adaptation plans by local governments and adaptation efforts by other entities. Furthermore, Japan will contribute to the promotion of adaptation efforts in developing countries that are particularly vulnerable to climate change impacts, by providing support for climate change impact assessment and the promotion of adaptation measures and for the development of relevant human resources, and for the improvement of scientific information infrastructure, utilizing Japan's knowledge and technologies.

We will promote the establishment of a mechanism to enhance and strengthen adaptation so that the above measures can be effectively promoted in cooperation with other stakeholders.

(3) Ozone layer protection measures

We will move to reduce emissions of fluorocarbons through policy support for de-chlorofluorocarbons, in addition to comprehensive measures throughout the lifecycle of fluorocarbons from upstream to downstream (production, use, recovery, and destruction/recycle) based on the Act on Rational Use and Proper Management of Fluorocarbons (Act No. 64 of 2001).

With regard to the publication of information on the regulation, observation and monitoring of specified substances, etc., the production and trade control of ozone depleting substances and hydrofluorocarbons (HFCs) will be regulated based on the Act on the Protection of the Ozone Layer Through the Control of Specified Substances, etc. and Other Measures (Act No. 53 of 1988), and the observation results and monitoring status of the ozone layer, etc. will be published annually. With regard to support for efforts in developing countries, we will support efforts in developing countries in Asia and other

regions by providing technical cooperation and knowledge and experience on policies related to shift from products and equipment using fluorocarbons and on the recovery and destruction of fluorocarbons.

2. Efforts for the conservation of biodiversity and sustainable use

(1) Strengthening efforts for the mainstreaming of biodiversity

(i) Participation by diverse stakeholders

Efforts through partnerships among different stakeholders are promoted through the "Japan Conference for 2030 Global Biodiversity Framework" (J-GBF), which consists of diverse stakeholders, in order to promote participation and cooperation by all stakeholders in Japan and to work for the conservation of biodiversity and its sustainable use.

We will take measures, including the provision of technical advice, to enable as many local governments as possible to develop local biodiversity strategies and action plans (LBSAPs) based on the Basic Act on Biodiversity, incorporating appropriate targets and indicators and specific measures to be taken in cooperation with local stakeholders taking into account local circumstances.

(ii) Realization of Nature Positive Economies

In addition to the dissemination of the Guidelines for Private Sector Engagement in Biodiversity for businesses, which compiles basic information on business activities related to biodiversity and the idea of natural capital, businesses are supported and encouraged to participate in the field of biodiversity through the use of an award system and other means. We will also consider measures for the mainstreaming of biodiversity, including economic approaches such as the Payment for Ecosystem Services (PES) and offsets for the remaining burden on biodiversity after reducing the burden of business activities to the greatest extent possible. In addition, the project will promote efforts to shift individual lifestyles by publicizing and raising awareness through the promotion of activities to interact with nature and by disseminating products that are certified as biodiversity-conscious.

(iii) Promotion of interaction with nature

We will work on measures such as the promotion of children's nature experience activities, holding nationwide events related to interaction with nature during "Green Month,"

implementing various awards, providing information, utilizing human resources of volunteer wardens and park volunteers, maintaining and operating national gardens with historic backgrounds and valuable urban natural environment to enhance their quality as gardens and the convenience of their facilities, and engaging in environmental education and nature experience activities in familiar places such as urban parks and seaside areas. We will also work for the protection and management of hot springs, which are valuable natural resources, their proper utilization, and the revitalization of hot spring resorts.

(2) Land conservation and management from the perspective of biodiversity conservation and sustainable use

(i) Formulation of ecological networks

We will strive to form ecological networks by adequately arranging and conserving core areas, which will serve as a core within an area where organisms inhabit and grow, and buffer zones to such core, and by connecting them organically with ecological corridors. In forming such ecological networks, we will take into consideration the topographical cohesiveness such as basin zones and the global ecological connectivity of habitats for migratory birds and other organisms that move across national borders, and actively conserve and restore on various scales the forests, the countryside, rivers and the sea as a seamless space, while utilizing protected areas and OECMs. Efforts will be implemented comprehensively based on the cross-sectoral cooperation among relevant organizations, by also considering measures against damage caused by wildlife.

(ii) Conservation of important areas

For each important area, comprehensive efforts for its conservation should be made through coordination and cooperation among relevant organizations, taking into consideration the appropriate layout, regulatory details, management level, and mutual coordination, etc., with sufficient scale, scope, and connectivity according to the target to be conserved.

A. Nature conservation area

Regarding the nature conservation area, etc. (wilderness areas, nature conservation areas, offshore seabed nature conservation areas, and prefectural nature conservation areas), we will continuously implement behavior regulation and understand the current situation, while considering and implementing measures necessary for biodiversity conservation, including the designation of new areas.

B. Natural parks

With regard to nature parks (national parks, quasi-national parks, and prefectural natural parks), while reviewing park plans including the new designation and expansion of national and quasi-national parks, behavior regulations and facility development for use based on park plans will be implemented. In addition, efforts will be made to protect outstanding nature and revitalize local communities through a virtuous cycle of protection and use of national parks, such as the nationwide development of the Project to Fully Enjoy National Parks and the enhancement of the attractiveness of stay-and-experience programs.

C. Wildlife protection areas

We will conserve, manage and improve the habitats of wildlife within the wildlife protection areas, and contribute to the conservation of biodiversity in the region through these activities. In addition, special protection areas are designated within the wildlife protection areas where it is particularly necessary to be conserved, and efforts will be made to secure the habitat of wildlife (including the maintenance, restoration, and improvement of local biodiversity necessary to secure a healthy habitat for wildlife).

D. Habitat protection zones

Where it is deemed necessary for the conservation of endangered species of wild fauna and flora, the habitat or growing environment of the individuals and the area that needs to be protected together with such areas will be designated. Then, we will identify and maintain the habitat environment, develop facilities, implement awareness-raising activities, and where necessary, designate restricted entry areas, and formulate a policy for protection according to the characteristics of the species to ensure the conservation of such species.

E. Natural monuments

Designation of natural monuments will be implemented systematically with various systems including behavior regulations, and through the understanding of the current state, as well as making efforts to ensure adequate conservation.

F. Protected forests and green corridors in national forest lands

In "protected forests" where pristine natural forests and rare species of wildlife grow

and inhabit, and in "green corridors" where networks are formed around these forests and provide migration routes for wildlife, appropriate protection and management will be promoted through monitoring surveys and other measures.

G. Forest reserves

Based on the National Forestry Plan (cabinet decision on October 13, 2023), we will systematically promote the deployment of forest reserves and work on their adequate management and conservation.

H. Special Green Space Conservation Districts, Suburban Special Green Space Conservation Zones, etc.

In order to ensure favorable green space management by diverse stakeholders, we will promote the use of systems to encourage appropriate green space management, such as management agreement systems.

I. Wetland under the Ramsar Convention

We will promote the conservation and wise use of wetlands, and raise public awareness on the importance of wetlands. At the same time, for wetlands that clearly meet the criteria of wetlands of international importance and would facilitate conservation and other efforts if registered, we will promote their designation as Ramsar Sites based on local needs and private sector initiatives. In addition, we will carry out environmental education at Ramsar Sites, providing opportunities to experience nature and related activities.

J. World Natural Heritage

In the five areas registered under the Convention Concerning the Protection of the World Cultural and Natural Heritage (Shirakami-Sanchi, Yakushima, Shiretoko, Ogasawara Islands, Amami-Oshima Island, Tokunoshima Island, Northern part of Okinawa Island, and Iriomote Island), we will promote adaptive conservation management based on scientific findings to protect the remarkable and universal value of the World Natural Heritage sites, an asset common to all humankind, into the future, as well as contributing to regional revitalization by promoting the sustainable utilization of the sites.

K. Biosphere reserve (UNESCO Eco-Park)

Through the management of national parks, etc., appropriate conservation and

management of registered biosphere reserves (UNESCO Eco-Parks) are promoted, and sustainable regional development is supported through participation in local councils. In addition, the committee will provide information and advice to local governments seeking registration.

L. Geopark

In geoparks that overlap with national parks, the conservation and utilization of topographical and geological diversity, etc., as well as the creation of geotourism and environmental education programs, will be promoted in cooperation with local governments and other organizations that promote Geoparks.

(iii) Nature restoration

With regard to the natural environment that plays an important role in conserving biodiversity, such as rivers, wetlands, tidal flats, macroalgal beds, Satochi-Satoyama (community-based forest areas and the surrounding countryside), and forests, we will promote nature restoration projects that are carried out from a long-term perspective based on scientific findings with the participation of diverse stakeholders, utilizing the framework of the Law for the Promotion of Nature Restoration (Law No. 148 of 2002). In addition, focusing on the functions of the natural environment including disaster prevention and disaster mitigation, we will promote the conservation and restoration of the natural environment throughout Japan, including the conservation and restoration of the natural environment that also contributes to community development and the "small-scale nature restoration " undertaken by local residents, etc.

(iv) Conservation and utilization of *satochi-satoyama* (community-based forest areas and the surrounding countryside)

In order to promote the conservation and sustainable use of the secondary nature areas in *satochi-satoyama* (community- based forest areas and the surrounding countryside) into the future, we will promote efforts to manage them sustainably, taking an integrated and comprehensive view of human life and production activities and the biodiversity of the area, in cooperation with private conservation activities. In "s*atochi-satoyama* (community-based forest areas and the surrounding countryside) important for biodiversity conservation" (Important *satochi-satoyama*), we will support advanced and effective activities that contribute to the conservation and utilization of *satochi-satoyama*, such as efforts to resolve environmental and socioeconomic issues by utilizing the resources of *satochi-satoyama*.

(v) Securing urban biodiversity

A. Development of urban parks

From the viewpoint of ensuring biodiversity in urban areas and securing opportunities for interaction with nature, the development of urban parks, etc., should be systematically promoted.

B. Support for local governments on biodiversity-conscious urban development

To promote biodiversity-conscious urban development efforts by local governments, such as incorporating biodiversity considerations into urban infrastructure development, etc., taking into account trends related to the International Council for Local Environmental Initiatives and its resolution "Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity," etc., we will promote the dissemination of the Technical Considerations for Ensuring Biodiversity at planning the Master Plan for Parks and Open Spaces, while also promoting to ensure the progress of biodiversity initiatives in urban areas are understood and evaluated by local governments based on City Biodiversity Index and are utilized in the future establishment of policies.

(vi) Efforts towards the achievement of the 30by30 target

Regarding the 30by30 target, we will promote efforts to achieve this target based on the 30by30 Roadmap, which is positioned as an annex to the National Biodiversity Strategy and Action Plan of Japan 2023-2030.

A. Expanding protected areas and improving the quality of management

In Japan, as of January 2023, approximately 20.5% of land and 13.3% of the sea have been designated as protected areas from the viewpoint of biodiversity. In order to achieve the 30by30 target, we will aim to increase those areas from the current level by expanding national parks, etc. Regarding national parks and quasi-national parks, we will continue to collect and streamline basic information on 14 candidate sites for the new designation or large-scale expansion of national parks/quasi-national parks, selected in the follow-up to the "Comprehensive Review of National Parks Project" in 2022. We will conduct detailed surveys of the natural environment and social conditions, as well as specific coordination with relevant organizations, and aim for the successive designation/inclusion as a national park/quasi-national park until 2030. We will strengthen the review and inspection work of national parks/quasi-national parks

by 2030, and where necessary, promote the incorporation of surrounding areas into national parks/quasi-national parks and the upgrading of land classification. In addition, the goal is to double the area of marine special zones within national parks by 2030, especially in coastal areas that are important from the perspective of landscape and usage and also conducive to the conservation of biodiversity. Further, in cooperation with a wide range of stakeholders, a virtuous cycle of protection and use of the target nature will be formed through the Project to Fully Enjoy National Parks, etc., while aiming to enhance the protection and management measures and management systems, including nature restoration, conservation of endangered species, measures against invasive alien species, and wildlife management.

B. Establishment and management of Other Effective area-based Conservation Measures (OECM)

The 30by30 target is to be achieved mainly through the establishment of OECMs. To this end, the first step is to promote the certification of areas where biodiversity is being conserved through private-sector efforts, etc. (corporate green areas, *satochi-satoyama* [community- based forest areas and the surrounding countryside], urban green areas, macroalgal beds and tidal flats, etc.) as "Nationally Certified Sustainably Managed Natural Sites". Certified areas will be registered in the World Database on Other Effective area-based Conservation Measures (WD-OECM), excluding overlaps with existing protected areas, thereby contributing to the achievement of the 30by30 target. Also, regarding forests, rivers, ports, urban green spaces, and the oceans that are managed under national systems, etc., relevant ministries and agencies will collaborate to examine areas that may fall under the OECMs category.

(vii) Promoting activities by private sector linked to places

In addition to activities in areas already rich in biodiversity, such as Nationally Certified Sustainably Managed Natural Sites, in order to further promote voluntary activities by the private sector and activities conducted in cooperation with various entities in the region, including those to restore or create ecosystems on abandoned lands, the Act on Promoting Activities to Enhance Regional Biodiversity (Act No. 18 of 2024) and other institutional considerations will be promoted, and various types of support will be provided for these activities.

(viii) Visualization of the status of biodiversity

As an initiative to support the achievement of the 30by30 targets and the formulation of

ecological networks, the importance of biodiversity and the effects of conservation activities will be visualized throughout the country, including the creation of maps to show the current status of biodiversity and effective areas for conservation, based on the nature environment data collected in (7) (iii). In addition, methods to evaluate and understand also the qualitative changes in ecosystems will be established and provided.

(ix) Promotion of the Nature-based Solutions (NbS) including the Ecosystem-based Disaster Risk Reduction (Eco-DRR)

In order to promote adaptation to climate change and disaster risk reduction based on natural ecosystems by strengthening the water reservoir function of entire basins through the restoration of former flood plains and wetlands, we will provide technical support to local governments in formulating various plans and initiatives based on the Guidelines for Creating and Using Ecosystem Conservation/Restoration Potential Maps published in FY2022 and the nationwide base map. In addition, we will organize Japan's approach to Nature-based Solutions (NbS), which are expected to make sustainable use of the functions of nature for solving various social issues, and promote regional NbS by providing technical information and data necessary for visualization of ecosystem functions and effective ecosystem conservation and management.

(3) Conservation of biodiversity in the oceans

Up to the present, Japan has identified oceans of high importance in terms of biodiversity, and will promote the expansion and networking of marine protected areas. Regarding the 30by30 target, an additional conservation of about 17% is necessary in the oceans, and relevant ministries and agencies will work together to designate the oceans where sustainable industrial activities will result in the conservation of biodiversity as OECM. In addition to conventional activities such as fisheries, human activities expected in the future such as the development of seabed resources and the use of natural energy should be balanced with the conservation of biodiversity in the oceans.

(4) Appropriate protection and management of wildlife and the strengthening of measures against invasive alien species

(i) Conservation of endangered species

We will accurately identify information on endangered wildlife and periodically review the Red List. Endangered species of wild fauna and flora will be designated based on the

Act on Conservation of Endangered Species of Wild Fauna and Flora (Act No. 75 of 1992) to regulate their capture and transfer. In addition, habitat protection zones will be designated and protection and propagation projects will be implemented for species found to be in need of the promotion of the breeding of individuals and the maintenance and conservation of habitats, etc. Upon the implementation of such projects, while placing the idea of maintaining in-habitat conservation as a basis, efforts for ex-situ conservation and return to the wild should also be made in cooperation with zoos and botanical gardens. For highly threatened species and populations, efforts will be made to reduce the risk of extinction of threatened species and to secure genetic resources by preserving genital cells and seeds. Furthermore, under the establishment of quantitative targets, effective conservation will be promoted by improving habitat and growth conditions and creating examples of completed projects.

(ii) Wildlife protection and management

A. Response to infectious diseases

Surveillance, information collection, and human resources development will be conducted in case of an outbreak of highly pathogenic avian influenza or other infectious diseases among wild birds and animals, or in case of damage caused by an oil pollution accident.

B. Measures against damage caused by wildlife

In recent years, wild animals such as Japanese deer and wild boars have expanded their distribution throughout Japan, causing serious damage to the ecosystem, living environment, and agriculture, forestry, and fishery industries, including feeding damage to rare alpine plants. The deadline of the goal set in FY2013 to halve the population of Japanese deer and wild boars by FY2023 (compared to FY2011) has been extended to FY2028, and measures to capture these animals will continue to be strengthened. In addition, efforts will be made to secure and develop human resources responsible for capturing these wild animals, develop capturing techniques, manage the habitat environment, prevent damage, and conduct expansive management. Furthermore, considering the goal of doubling the amount of wild game consumption by FY2025 compared to the level in FY2019, efforts will be made to expand game consumption through measures such as training hunters, assuming the increase of game consumption. With regard to bears, since the occurrence of human injuries caused by bears appearing in people's living areas is increasing, measures to prevent human injuries while maintaining the survival of local populations will be promoted.

(iii) Countermeasures against invasive alien species

We are promoting comprehensive measures against invasive alien species in accordance with the Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Alien Species (Act No. 78 of 2004), including the new designation of invasive alien species, regulations over importing and raising, implementation of control projects in areas important for biodiversity conservation and control projects to control invasive alien species at the early stage of invasion, such as fire ants, regulated as Designated Invasive Alien Species requiring urgent action, promotion of international cooperation, participation of various stakeholders including the business sector, and raising awareness to ensure proper raising of species. In order to further promote these efforts, the Invasive Alien Species Management Action Plan and the List for invasive alien species management in Japan will be revised.

(iv) Measures against genetically modified organisms

Concerning genetically modified organisms, an accurate assessment of the impact on biodiversity when used in the environment should be made in advance, and monitoring of the impact on biodiversity should be promoted.

(v) Welfare and management of animals

Based on the Act on Welfare and Management of Animals (Act No. 105 of 1973), the Act on Ensuring of Safety of Pet Animals Feed (Act No. 83 of 2008), and the Veterinary Nurses for Companion Animals Act (Act No. 50 of 2019), we will comprehensively promote animal welfare measures, including the prevention of cruelty and ensuring proper care of animals, as well as measures for the adequate management of animals, including the prevention of harm or trouble to humans caused by animals.

(5) Sustainable use

(i) Establishment of a food system in harmony with the environment

While the agriculture, forestry, and fisheries industry is an essential activity that supplies food, living materials, and other necessities for human existence, the activities of the industry have long played an important role in Japan in shaping the natural environment around us and in the growth and inhabitation of diverse species of living organisms. In the future, it will be necessary to promote sustainable agriculture, forestry, and fisheries in consideration of environmental conservation and to revitalize the farming, forestry, and

fishing villages that support these industries, while meeting expectations for a stable supply of safe food, wood, and other resources. Therefore, in order to achieve both productivity improvement and sustainability of food, agriculture, forestry, and fisheries through innovation for the establishment of sustainable food systems in harmony with the environment, we will promote the efforts to reduce environmental loads based on the "MIDORI Strategy, the strategy for sustainable food systems" formulated in May 2021 and the MIDORI Act enacted in July 2022, including the reduction of greenhouse gas emissions and the reduction of the use of chemical pesticides and fertilizers. We will actively promote sustainable forest management and the use of ecosystem-friendly renewable energy. In addition, Good Agricultural Practice (GAP) considerate to the environment will be promoted and disseminated in agricultural production sites to create an environment that encourages farmers to actively engage in organic agriculture.

(ii) Promotion of eco-tourism

We will promote supports for regions that are engaged in sustainable regional development through the conservation and utilization of natural resources, dissemination of the basic concept of eco-tourism and the status of efforts in each region through websites, etc., development of human resources such as guides, collection and streamlining of information, strategic public relations activities, and coordination with other policies, etc.

(iii) Access to genetic resources and benefit sharing

We will promote the appropriate implementation of the Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, which is a domestic measure under the Nagoya Protocol that entered into force for Japan in August 2017, to promote the lawful acquisition and appropriate utilization of overseas genetic resources and the fair and equitable sharing of benefits arising from their utilization.

(6) International efforts

(i) Contribution to the achievement of the global targets for biodiversity conservation

We will actively contribute to the achievement of the Kunming-Montreal Global Biodiversity Framework (GBF) adopted in December 2022. To this end, through measures such as the second phase of the Japan Biodiversity Fund and contributions to

the GBF Fund, we will support the capacity building of developing countries regarding various approaches necessary for achieving the GBF, including the formulation and revision of national biodiversity strategies and action plans.

(ii) Strengthening the interface between science and policy on biodiversity and Ecosystem Services

We will actively participate in the operation of IPBES, which provides scientific assessments, knowledge generation, capacity building, and support for policy making in order to strengthen the link between biodiversity science and policy and to effectively and efficiently conserve biodiversity. IPBES also contributes to the provision of data to the Ocean Biodiversity Information System (OBIS) and Global Biodiversity Information Facility (GBIF), which are global information platforms on biodiversity.

(iii)Biodiversity conservation in the secondary nature environment and the promotion of sustainable use and management

We will promote the Satoyama Initiative by supporting the efforts of the International Partnership for the Satoyama Initiative (IPSI), in order to promote the conservation and sustainable use and management of biodiversity in the secondary nature environment on an international scale.

(iv) Promotion of Asia Protected Areas Partnership (APAP)

We will promote the Asia Protected Areas Partnership (APAP), a framework for stakeholders in protected areas to share information through workshops and other means in order to improve the management level of protected areas in Asia.

(v) Promotion of forest conservation and the sustainable forest management and timber use

In order to promote global efforts toward sustainable forest management, we will strive to promote efforts utilizing various multilateral, regional, and bilateral frameworks through active participation in international dialogues such as the United Nations Forum on Forests (UNFF) and Montreal Process, cooperation through international organizations such as the International Tropical Timber Organization (ITTO) and the Food and Agriculture Organization of the United Nations (FAO), and technical and financial cooperation through the Japan International Cooperation Agency (JICA), the Green Climate Fund (GCF), and other organizations. We will also develop efforts to promote the sustainable use of timber, which contributes to the realization of a

decarbonization society, through international organizations such as FAO and ITTO.

(vi) Promotion of measures against desertification

While taking into account international trends related to the United Nations Convention to Combat Desertification (UNCCD), and with a view to contributing to the Convention from the perspective of science and technology, we will promote research on the use of technology to combat desertification, especially in Mongolia, and promote international cooperation including bilateral cooperation.

(vii) Protection of the environment in the Antarctic region

In order to protect the environment in the Antarctic region, we will promote the appropriate enforcement of the Protocol on Environmental Protection to the Antarctic Treaty and its relevant law in Japan, the Act on Protection of the Environment in Antarctica (Act No. 61 of 1997), by operating a confirmation system for observation, tourism, etc. in the Antarctic region, and by raising public awareness.

(viii) Conservation of coral reefs

Based on the Global Coral Reef Monitoring Network (GCRMN) East Asia Regional Analysis Implementation Plan formulated within the framework of the International Coral Reef Initiative (ICRI), we will cooperate with other countries in the global analysis of coral reef ecosystem monitoring data.

(ix) Promotion of the activities of the East Asian-Australasian Flyway Partnership (EAAFP)

The East Asian-Australasian Flyway Partnership (EAAFP) is an international framework for the conservation of migratory waterbirds and their important habitats. We will promote efforts, such as public awareness raising, research and study, training, and information exchange at the 34 Flyway Network Sites in Japan, while promoting collaboration and cooperation with various stakeholders including relevant ministries, international organizations, and NGOs in countries located along the Flyway.

(x) Implementation of conventions related to biodiversity

We will promote international initiatives under the following frameworks:

- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as the Washington Convention): conservation and sustainable use of endangered wildlife:

- Ramsar Convention: conservation and wise use of wetlands of international importance;
- Bilateral Conventions and Agreements for the Protection of Migratory Birds: protection of migratory birds;
- Cartagena Protocol: prevention of impacts on biodiversity through restriction on the use of genetically modified organisms and other measures;
- Nagoya Protocol: appropriate access to genetic resources and fair and equitable sharing of benefits arising from their utilization.

(7) Infrastructure development for the conservation and sustainable use of biodiversity

Using the information collected and maintained, we will communicate to the public in an easy-to-understand manner the status of biodiversity and the efforts being made through relevant measures.

(i) Maintenance and provision of natural environment data

In order to address various biodiversity conservation issues, it is essential to accumulate scientific findings and formulate policies based on such knowledge. To this end, we will promote the development of a system for the continuous implementation of various types of monitoring, including the National Survey on the Natural Environment (Green Census), creation of vegetation maps, and Monitoring Site 1000, and for the collection and provision of data through collaboration with various entities. In addition, natural environment data will be improved through the enhancement of monitoring participated in by citizens and its use as basic data, and the sharing and disclosure of information through the strengthening of mutual networks among universities, local and private research institutes, and museums, including those overseas.

(2) Assessing the effects of radiation exposure on wild fauna and flora

In order to understand the impact of radiation exposure caused by the accident at TEPCO Daiichi Nuclear Power Plant on the natural ecosystem, surveys will be conducted by collecting samples of wild fauna and flora and measuring their radiation levels. Information will be gathered and shared with relevant organizations and experts in various fields by holding a meeting for reporting the results of the survey.

(3) Comprehensive assessment of biodiversity and ecosystem services

The status and changes of biodiversity and ecosystem services and their drivers will be

assessed based on the latest scientific findings, which are compiled in the Japan Biodiversity Outlook (JBO), to provide objective information for supporting policy making and this will be communicated to the public in an easy-to-understand manner. In addition, this assessment will be coordinated with the National Biodiversity Strategy and Action Plan of Japan 2023-2030 in order to effectively and efficiently promote the evaluation of the progress in its achievement.

3. Establishment of sound material-cycle society

(1) Create sustainable communities and a sustainable society by transitioning to a circular economy with the aim of forming a sound material-cycle society

The shift to a circular economy, which aims to maximize the value of resources and products through restoring, maintaining, or adding value to them through servicing, etc., while promoting 3R to reduce the input and consumption of resources, use products through repairing and maintenance, and recycle circulated resources, promoting the use of renewable resources, and making effective use of stocks, can be considered as a driving force for a sound material-cycle society, and leads to minimized resource consumption, reduced waste generation, and lower environmental loads.

In addition to the environmental aspect, this shift to a circulation economy will contribute to securing resources and responding to resource constraints, strengthening international industrial competitiveness, and enhancing economic security, given the current international situation, including the international trend toward strengthening resource security, the trend toward forming rules for human rights and environmental due diligence, and the trend toward tighter regulations in Europe. Based on such situation, we will promote the formulation of a sound material-cycle society by promoting a circular-economy approach that is effective in improving resource efficiency and circulation throughout the value chain. In making the transition to a circular economy, it may be necessary for each entity to implement initiatives that are not economically rational in the short term, so policies should be pursued to ensure that the initiatives of each entity proceed smoothly and are highly evaluated in the society.

Promoting the transition to a circular economy will contribute to realizing a sustainable society, including both economic and social aspects, in addition to environmental aspects, such as the realization of net-zero emissions through the reduction of greenhouse gas

emissions, waste reduction and pollution prevention, and the realization of nature-positive through the reduction of environmental load on natural capital. Therefore, based on the relationship between each of these efforts, we will promote integrated policies that will have a synergistic effect while avoiding trade-offs to the maximum extent possible.

Promoting the transition to circular regional economies may contribute, for instance, to solving regional problems and promoting local industries, and will lead to the creation of sustainable regional communities and local revitalization. At the same time, it will lead to the realization of a circulation and symbiosis based society based on such sustainable region, which means a sustainable society where decarbonized society, a sound material-cycle society, and society in harmony with nature are simultaneously realized.

(2) Thoroughly circulate resources throughout the entire lifecycle through resource circulation-oriented coordination between business operators

In order to realize the transition to a circular economy, it is necessary to optimize each stage of the life cycle (resource procurement, production, distribution, use, and disposal) and to implement thorough resource circulation throughout the life cycle. Thus, arteriovenous cooperation, where efforts in arterial industries including manufacturing and retail businesses and those in venous industries including waste disposal and recycling businesses collaborate organically, becomes important. Based on this idea, we will accelerate domestic and international resource circulation and promote measures to support the creation of a resilient resource circulation market in the mid- to long-term, in line with the situation in Japan. For example, in light of the current international situation, we will promote measures to strengthen the circulation of metal resources such as rare metals in Japan, which will contribute to the economic security and to strengthen the supply chain of important minerals, in response to the tight supply and demand of mineral resources worldwide. In addition, with the progress of efforts to promote the use of recycled materials both domestically and internationally, measures to secure necessary recycled materials through arteriovenous cooperation and to facilitate the smooth use of recycled materials will be promoted.

On the arterial side, such as in the manufacturing and retail sectors, measures will be taken to strengthen efforts by businesses including the promotion of the Design for Environment (DfE), sustainable procurement, reduce, reuse, making biomass and using recycled materials, and voluntary collection. As a further development of reuse, measures

to foster the business of "Re-commerce," which promotes appropriate long-term use of products such as sharing, subscription and other forms of servicing, repairing and maintenance, and secondary distribution intermediation, will be promoted from the perspective of promoting appropriate long-term use of products.

On the venous side such as waste disposal and recycling industries, based on the advanced examples of companies and regions, measures to establish a decarbonization-oriented resource circulation system in venous industries necessary for realizing a sound material-cycle society will be promoted, including measures to expand initiatives in cooperation with arterial industries nationwide, and measures to promote decarbonization by utilizing information on resource circulation in venous industries. In promoting resource circulation through arteriovenous cooperation, we will also pay attention to the perspectives of ensuring product safety, managing the risk of hazardous substances, and preventing illegal dumping and improper disposal, and promote appropriate initiatives by each entity.

Also, regarding the sorting, collection, and use of circulation resources, we will promote measures to encourage behavioral change and promote concrete actions through dialogues with consumers and residents, as well as through positive and proactive changes in their awareness of environmental issues and the visualization of environmental values.

From the perspective of environmental loads, amount of wastes generated, and contribution to decarbonization, concrete measures to accelerate efforts regarding products for which thorough resource circulation must be considered throughout the life cycle including plastics and waste oil, biomass including food waste, metals, construction materials including earth and stone, buildings, automobiles, small home appliances and home electronics, solar power generation equipment, lithium-ion batteries, and clothing, will be promoted based on the direction suggested in the Circular Economy Roadmap (September 2022), towards the goals like doubling the collected amount of plastic resources or doubling the amount of metal materials to be recycled.

From an economic perspective, it is essential to set circular economy-related businesses including businesses in circulation industry as the engine of growth, and to sustain and mainstream efforts toward the transition to a circular economy while enhancing industrial competitiveness. By also considering the "Growth Strategy Follow-up Process Chart"

(cabinet decision on June 18, 2021) and the Circular Economy Roadmap, we will move forward measures to promote the transition to a circular economy, including measures utilizing Green Transformation (GX) investments, with the goal of increasing the market size of circular economy-related businesses to over 80 trillion yen by 2030.

We will promote measures related to the understanding of resource circulation information to promote arteriovenous cooperation and the development of information infrastructure utilizing various digital technologies, such as electronic manifests.

In addition, we will promote the application of extended producer responsibility, the promotion of voluntary actions by businesses, the utilization of economic incentives, informational measures, public procurement, partnerships with business, and other policy mixes.

(3) Build diverse regional circulation systems and revitalize regions

(i) Creating a regional circulation system

In order to build a sound material-cycle society with high resource productivity even under the circumstances of declining population, falling birthrate, and aging population, it is important to promote sustainable and vibrant community development with smaller resource input and waste generation, through measures such as the circulation of recyclable resources on an optimal scale for each region and resource, continuous utilization of local renewable resources within the region, adequate maintenance and management of regional stocks, and using them wisely as long as possible. In order to realize a sound material-cycle based society, measures to integrate decarbonized society, a sound material-cycle society, and society in harmony with nature should be promoted also within the regional community.

Specifically, we will promote efforts such as the maximized use of resources through the reduction of food loss and food recycling in the food system, reuse of used products, circulation of biomass resources such as the use of organic waste (food waste, human waste, *Johkasou* [decentralized wastewater treatment system] sludge, sewage sludge) and unused resources as fertilizer and energy, expansion of wood utilization, resource circulation of plastics and metal resources, and recycling of used paper diapers, as well as measures to resolve regional issues and revitalize local communities such as the regeneration of regional communities, job creation, promotion of local industries,

responding to aging of society, and the conservation of ecosystems, by establishing sustainable agriculture, forestry, and fisheries harmonized with nature as a regional industry.

(ii) Expansive efforts to support the creation of a circulation system

As an initiative to support (i), we will promote measures to revitalize the regional economy and society and to resolve regional problems through economic activities in the circulation sector, including financial institutions.

We will widely collect information on initiatives in leading areas in terms of measures for resource circulation, organize and share the collected information, and promote measures to horizontally develop the initiatives across the country.

Further, in order to promote various objectives such as thorough resource circulation, decarbonization, and regional community development in each region, we will promote measures to establish initiatives that will serve as a basis for resource circulation in the regional community, such as the development of decentralized resource recovery base stations and corresponding facilities, and to put into practice regional initiatives such as the study and implementation of charging for domestic waste disposal, expansive and intensive waste treatment, and the introduction of technologies for effective energy recovery in accordance with the characteristics of the community.

(iii) Regeneration of regional environment polluted by waste

We will promote measures to understand the actual status of waste discharged into the environment in oceans and rivers, including microplastics, as well as measures to control their generation and to collect and treat them.

Regarding the problems causing any hindrance to the conservation of the living environment such as illegal dumping of waste, measures to eliminate such hindrances, as well as measures to prevent the occurrence and spread of such problems will be promoted.

(4) Improve resilience of platform for circulating resources and managing waste, steadily and appropriately dispose of waste and restore the environment

(i) Strengthening of technology development, information infrastructure, collaboration among various entities, and human resource development

In order to achieve thorough resource circulation throughout the entire life cycle, we will promote the realization of both the strengthening of resource circulation and waste management infrastructure and the decarbonization in the area of resource circulation, through measures such as the development of technologies necessary for the diffusion of new business models related to circular economy in the region and society as a whole, such as the advanced recycling including the dismantling, crushing, and sorting of used products, making biomass and using recycled materials, the establishment of 3R for new products and materials that are rapidly becoming popular, and the visualization of environmental loads, as well as measures to thoroughly utilize the latest technologies such as digital technology and robotics from the perspective of ensuring traceability and improving efficiency.

In addition, measures will be taken to develop and secure comprehensive human resources who will be responsible for resource circulation in the region in a wide range of areas, and to promote education and cooperation among different entities on various occasions.

We will promote measures to raise individual awareness and to diffuse information and create mechanisms that will lead to actual actions by people of all status who are aware of various issues. In particular, we will promote highly effective measures for the younger generation, who are using new technologies and services and living new lifestyles, considering such lifestyles and changes in their awareness.

Further, with the expansion of ESG investment, it is important that companies that take the lead in Japan's resource circulation efforts are appropriately evaluated by investors, leading to improved corporate value and enhanced industrial competitiveness. Therefore, we will promote measures to encourage proactive information disclosure in terms of the circular economy and constructive dialogue with investors.

In addition, with regard to microplastics and other wastes discharged into the environment including the ocean, we will promote international collaboration based on the international trends such as the Intergovernmental Negotiating Committee (INC) for the formulation of a legally binding international instrument (convention) on plastic pollution, as well as promote measures to accumulate scientific findings such as the harmonization of monitoring methods and environmental impact assessment.

(ii) Establishment of a disaster waste treatment system and the steady implementation of disaster waste treatment

In order to carry out the treatment of disaster waste in addition to the collection and treatment of household garbage and human waste, properly and promptly in times of disaster, the waste treatment system should be strengthened from usual times and in a multilayered manner at the local government level, regional block level, and national level, including human support from the national government, local governments, research and specialized institutions, and private businesses, and the promotion of cooperation to realize expansive disposal.

In doing so, we will consider the integration of measures against wind and flood damage with adaptation measures in terms of global warming, integration with responses to asbestos and chemicals, and information sharing with residents regarding disaster waste countermeasures in the event of a disaster. We will also cooperate with relevant ministries and agencies for the proper treatment of disaster waste.

Furthermore, measures will be taken to promote the formulation and revision of an effective disaster waste treatment plan, such as continuously listing land applicable as temporary storage sites (TSS) for disaster waste, and making preparations to ensure its operation in the event of a disaster.

(iii) Further promotion of appropriate treatment

The appropriate treatment of waste, including countermeasures against hazardous wastes and the management of chemicals, is essential from the perspective of living environment conservation and the improvement of public health, and will continue to be a major prerequisite for promoting efforts to realize the transition to a circular economy. In terms of the principles of resource circulation and waste disposal, the first priority is to thoroughly implement the 3Rs + Renewable (making biomass and using recycled materials) and to ensure the appropriate treatment of waste that remains after these principles have been thoroughly implemented. In promoting resource circulation, we will also pay attention to the perspectives of ensuring product safety, managing the risk of hazardous substances, and preventing illegal dumping and improper disposal, and promote appropriate initiatives by each entity.

Furthermore, there will be measures to strengthen countermeasures against improper disposal of waste, to eliminate illegal dumping, to steadily promote measures against

hazardous waste such as asbestos, POPs waste, mercury waste, and buried pesticides, and to promote secure and appropriate disposal of polychlorinated biphenyl (PCB) waste on time.

(iv) Environmental regeneration after the Great East Japan Earthquake

In order to regenerate the environment in the areas affected by the Great East Japan Earthquake, the entire government will promote measures to steadily make progress in the appropriate disposal of waste contaminated by radioactive materials and reducing the volume and promoting recycling thereof for final disposal, based on the understanding of the public and also in cooperation with local governments and other stakeholders.

We will also contribute to the reconstruction of Fukushima through environmental measures such as decarbonization, resource circulation, and harmony with nature, and promote future-oriented initiatives while responding to local needs such as industrial creation and regional development.

(5) Build a proper global resource circulation system and promote the overseas expansion of Japan's resource circulation industry

(i) Establishment of an international circulation policy and the promotion of domestically and internationally integrated circulation policies

We will lead discussions, negotiations, and consensus building on resource circulation policies at international policy-making forums such as the G7, G20, and the OECD to promote the international circular economy, and promote measures to realize a virtuous circle that improves domestic circulation policies by appropriately incorporating such international trends and policies.

(ii) Establishment of an appropriate international resource circulation system

We will promote measures to establish an international metal resource circulation system to increase appropriate recycling of metal resources (electronic scrap, etc.), including important mineral resources generated overseas including ASEAN and OECD countries, by taking advantage of Japan's advanced environmental technologies, and to reuse them in the supply chain.

With regard to measures against illegal imports and exports, we will further promote cooperation with relevant ministries and agencies, relevant countries, and relevant

international organizations, and promote measures to ensure the effectiveness of control. International discussions on the promotion of smooth import and export of recycled materials and their raw materials will be accelerated. In order to further facilitate imports into Japan working as a recycling hub, we will further promote the certification system under the Act for the Control of Export and Import of Specified Hazardous and Other Wastes (Act No. 108 of 1992) and consider the digitization of procedures. Relationships with Asian countries should be further strengthened to improve the ability to deal with illegal exports at the point of border control.

(iii) Promotion of the international expansion of Japan's circulation industry and the development of circulation infrastructure in developing countries

In order to prevent environmental pollution and health hazards, including plastic pollution, in ASEAN and other developing countries, we will promote environmentally-appropriate waste management and infrastructure development in cooperation with relevant ministries and agencies and relevant countries, by developing a package of institution establishment, technology introduction, and human resource development related to Japan's excellent waste treatment and recycling systems.

Regarding sewage systems and *Johkasou*, we will take measures to promote the international development of comprehensive sewage treatment services in a well-balanced manner that takes advantage of the respective strengths of collective and individual treatment.

In addition, by utilizing the international platform led by Japan, we will promote the transition to a circular economy and waste management initiatives in developing countries in Asia and Africa, including the reduction of methane emissions from disposal sites, expand demand for waste management, etc., in which Japan has an advantage, and promote measures for the international expansion of the circulation industry and the export of circulation infrastructure.

(6) Promotion of environmental regeneration from nuclear disasters

(i) Decontamination measures of soil contaminated by radioactive materials

With regard to wastes contaminated by the dispersal of radioactive materials due to the accident at TEPCO’s Fukushima Daiichi Nuclear Power Station (TEPCO’s FDNPS) caused by the Great East Japan Earthquake and soil generated as a result of

decontamination and other measures, appropriate and safe treatment will continuously be carried out based on the Act on Special Measures concerning the Handling of Environment Pollution by Radioactive materials Discharged by the NPS Accident Associated with the Tohoku District - Off the Pacific Ocean Earthquake That Occurred on March 11, 2011 (Act No. 110 of 2011) (hereinafter referred to as the "Act on Special Measures concerning Pollution by Radioactive materials") and the Basic Policy under the Act.

We will promote the development of the Interim Storage Facility to safely and intensively manage and store the soil and waste generated by decontamination activities in Fukushima Prefecture until their final disposal outside the Prefecture, and the transportation of the removed soil and waste into the Interim Storage Facility.

With regard to soil generated as a result of decontamination and other measures outside Fukushima Prefecture, we will provide technical and financial support to municipalities to ensure its appropriate and safe disposal and the continuation of appropriate storage until the time of disposal, and will steadily promote the disposal.

(ii) Efforts toward the final disposal outside Fukushima Prefecture

The Act on Japan Environmental Storage & Safety Corporation (JESCO) clearly states that necessary measures must be taken to complete the final disposal outside Fukushima Prefecture within 30 years after the start of interim storage, and the national government will take responsibility for its implementation. By FY2024, which is the target year of the "Technology Development Strategy for Volume reduction & Recycling of the Removed Soil," we will present a plan for measures in FY2025 and beyond towards the final disposal outside of Fukushima Prefecture, based on the results of studies implemented up to that point. Regarding the development of destinations for removed soil and waste recycling, the government working together as one will promote initiatives toward the establishment of a system by strengthening cooperation among related ministries and agencies, etc., and promote concrete measures while gaining the understanding of local communities.

(iii) Disposal of wastes contaminated with radioactive materials

In Fukushima Prefecture, we will continue to work on the reduction of the volume of specified wastes and landfill disposal projects. As for specified wastes outside of Fukushima Prefecture, we will continuously provide technical and financial support to

ensure appropriate storage, and will promote the disposal while also using the rule of cancellation of specified wastes according to the actual situation in each prefecture.

(iv) Initiatives for the reconstruction and revitalization of the Restricted Area

Regarding the areas outside of the Specified Reconstruction and Revitalization Base Areas (SRRBA), we will first work on decontamination and infrastructure development in accordance with each municipality's plan for the Reconstruction and Revitalization Plan for the Specific Revitalized Residential Areas based on the Act on Special Measures for the Reconstruction and Revitalization of Fukushima (Act No. 25 of 2012), which was revised in June 2023, so that all residents who intend to return can return home during the 2020's.

(v) Consideration of measures against environmental pollution by radioactive materials

The Act on Arrangement of Relevant Acts for Prevention of Environmental Pollution Caused by Radioactive Materials (Act No. 60 of 2013) did not delete the exemptions pertaining to radioactive materials in the Act on Waste Management and Public Cleaning (Act No. 137 of 1970) (hereinafter referred to the Waste Management Act), Soil Contamination Countermeasures Act, and other acts. We will consider the handling of these acts also based on the results of the inspection of the implementation status of the Act on Special Measures concerning Pollution by Radioactive materials.

4. Initiatives for the environmental conservation and regeneration of water, soil, ocean, and air

(1) Maintenance and restoration of sound water circulation

In order to maintain and restore sound water circulation, it is necessary for all stakeholders to cooperate and take measures by mutually sharing a future vision based on the characteristics of each basin and region with a common understanding of information and issues in various fields related to the water circulation.

Based on the Water Circulation Basic Act (Act No. 16 of 2014), which came into effect in 2014, we will work on spreading awareness on activities to conserve good water circulation and the water environment through the "Water Project", a cooperation between the public and private sectors, in order to maintain and restore good water circulation.

We will also be engaged in measures such as the further development and improvement of the quality of basin management, responding to risks caused by climate change and major natural disasters, promoting awareness, publicity, education, and international contribution on the sound water circulation, as well as promoting measures such as the appropriate conservation and use of groundwater, in order to maintain and restore sound water circulation based on the Water Circulation Basic Plan (partially modified in June 2022).

(2) Water environmental conservation

(i) Establishment of environmental standards and the implementation of wastewater management

Regarding environmental standards for water pollution, we will study the ideal environmental standards for the conservation of the living environment that respond to the needs in the future and in each region, while promoting the use of the amount of dissolved oxygen in bottom waters, which is a new environmental standard. Efforts will be made to accumulate knowledge on pathogens such as protozoa and viruses that cause waterborne infectious diseases, and to examine the effectiveness of the coliform count as a sanitation indicator, as well as indicators other than the coliform count. Since there is a lack of basic information on the presence and health impacts of antimicrobial resistance in the aquatic environment, we will promote the collection of such information. Based on the latest findings on chemicals in the environment and studies on chemicals management, additions and revisions of environmental standards related to the conservation of aquatic organisms and the protection of human health will be considered.

Based on the Water Pollution Prevention Act, the national government and prefectures will constantly monitor the quality of public water areas and groundwater, including radioactive materials, on a continuous basis.

In order to achieve and maintain the water quality environmental standards, we will promote measures such as effluent control based on the Water Pollution Prevention Act, reduction of total pollution load, pesticide use control based on the Agricultural Chemicals Regulation Act (Act No. 82 of 1948), and pollutant load control measures including the improvement of sewage systems, agricultural community wastewater treatment facilities, and domestic wastewater treatment facilities such as *Johkasou*,

according to how the wastewater is generated, such as factory and industrial wastewater, domestic wastewater, and wastewater from non-specified pollution sources such as urban areas and agricultural lands, etc. While properly understanding the actual status of wastewater discharged from each industry, necessary revisions should be made as needed, especially with regard to the provisional effluent standards that have been set for some industries as a transitional measure for a certain period of time. In addition, other appropriate support measures will be taken as necessary.

(ii) Water quality and sanitation

In order to supply the public with safe tap water that complies with tap water quality standards, we will continue to steadily establish and review tap water quality standards based on the latest scientific findings.

In managing the quality and sanitation of tap water, integrated risk management from the water source to the tap water should be promoted along with the water environment management. Specifically, with regard to perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), which are of growing concern in Japan and abroad, efforts to ensure safety and security should be promoted through such measures as the strengthening of environmental monitoring and the enhancement of scientific findings, based on the "Direction of Future Responses to Perfluoroalkyl substances and polyfluoroalkyl substances (PFAS)" (July 2023, by the Expert Group on Comprehensive Strategy for PFAS). In addition, issues related to pathogenic microorganisms that may cause waterborne infectious diseases will be studied.

Furthermore, in managing risks related to pollution of tap water sources, etc. caused by natural disasters and accidents, case studies and scientific findings should be collected, and the strengthening of safety measures for tap water quality in case of emergency should be considered including the establishment of a system for prompt information sharing among relevant parties such as environmental departments and water supply departments of the national and local governments, and the study on how risk management should be carried out.

(iii) Lakes and marshes

With regard to the 11 designated lakes for which a Lake Water Quality Conservation Plan has been formulated based on the Act on Special Measures for the Conservation of Lake Water Quality (Act No. 61 of 1984), in addition to various regulatory measures based on

the Plan, the following projects will be promoted in a comprehensive and systematic manner: increasing the coverage rate of sewage systems and *Johkasou*, water management for agricultural land from the perspective of nonpoint load management, forest development, and other projects.

For Lake Biwa, based on the Basic Policy on Conservation and Restoration of Lake Biwa in accordance with the Act on Conservation and Restoration of Lake Biwa (Act No. 75 of 2015), various measures such as the conservation and improvement of water quality and measures against invasive alien species will be promoted in cooperation with related organizations.

In addition to the conventional concept of lake water quality conservation, which is to improve the quality of lake water by reducing the inflow load, we will also support regional efforts by enhancing the knowledge and considering countermeasures regarding issues such as the reduction of the amount of dissolved oxygen in bottom waters, abnormal growth of phytoplankton, and the overgrowth of waterweeds, based on the idea of conserving marine resources and water quality by facilitating the smooth circulation of materials. We will steadily implement these measures, and will also study indicators for evaluating the soundness and material circulation of lakes and marshes.

(iv) Enclosed coastal seas

Although water quality in enclosed coastal seas has been improved as a result of past efforts, there are problems occurring such as COD level remaining high, decreased amount of dissolved oxygen in bottom waters, rising water temperatures and ocean acidification due to climate change, while in some sea areas, decrease in biodiversity and biological productivity due to the shortage of nutrient salts remains as an issue.

Therefore, in the Seto Inland Sea, we will promote efforts based on the Act on Special Measures concerning Conservation of the Environment of the Seto Inland Sea (Act No. 110 of 1973) and, in preparation for the follow-up to be conducted approximately five years after the enforcement of the revised Act (April 2022), we will collect information and conduct surveys and studies on the effects of the management of nutrient salts on securing biodiversity and biological productivity, for further appropriate improvement measures. With regard to the System for the Reduction of Total Pollution Load that has been applied to Tokyo Bay, Ise Bay, and the Seto Inland Sea, we will continue to study

more fine-tuned water environment management in accordance with the detailed conditions of the sea area, including a review of the system.

From the viewpoint of purification, securing biodiversity, and carbon fixation functions, we will promote projects for the appropriate conservation, restoration, and creation of natural coasts, blue infrastructure (macroalgal beds/tidal flats and symbiosis-oriented artificial structures in ports), as well as blue carbon initiatives through these activities. In addition, we will promote efforts to conserve, restore, and create healthy ecosystems through measures such as improving the bottom sediment environment by effectively utilizing dredged soil generated during port construction as cover sands, backfilling the remains of deep dredging, which is one of the causes of dysoxic water, and introducing environmentally-conscious artificial structures that supplement the lost ecosystem functions. By these actions, comprehensive measures should be promoted through cooperation between the public and private sectors, covering the entire basin while incorporating the concept of "satoumi" creation.

Also, for Ariake Sea and the Yatsushiro Sea, etc., evaluation and measures for restoration based on the Act on Special Measures concerning Rejuvenation of Ariake Sea and Yatsushiro Sea, etc.. (Act No. 120 of 2002) should be promoted.

(v) Groundwater and ground environment

As for groundwater quality, contamination by hazardous substances such as organic chlorinated compounds is being continuously identified. Therefore, efforts to prevent groundwater pollution will be promoted by regulating underground seepage of hazardous substances based on the Water Pollution Prevention Act, complying with standards for the structure of facilities that store hazardous substances, and conducting periodic inspections. With regard to measures against groundwater pollution by nitrate-nitrogen and nitrite-nitrogen, we will provide local governments with the case examples of support for regional initiatives, and promote study on measures to promote load reduction.

In addition, in order to prevent land subsidence and other troubles caused by the lowering of the groundwater level, measures to control groundwater extraction should be promoted, while also diffusing the use of geothermal heat, a renewable energy, as a countermeasure against global warming. We will promote the study of measures to encourage the sustainable use and conservation of groundwater.

Furthermore, based on the purpose of the addition of "Appropriate Conservation and Use of Groundwater" according to the Water Circulation Basic Act in June 2021 and the partial amendment of the Water Circulation Basic Plan in June 2022, we will promote efforts to ensure sound water circulation in terms of groundwater and ground environment conservation throughout the entire basin.

(vi) Promoting water environmental conservation in Asia

We will aim to strengthen water environment governance by strengthening cooperation and information sharing with other Asian countries and providing support for water environment improvement programs (action programs) based on requests from each country, through the Water Environment Partnership in Asia (WEPA), a network of administrative officials involved in water environment management in 13 countries in the Asian region, utilizing Japan's knowledge on the legal system, human resource development, technology, etc., which have been used to improve the water environment step by step. Furthermore, such information will be disseminated at the World Forum and other forums, and we will promote international cooperation to contribute to the improvement of the global water environment.

In addition, by supporting the overseas development of private companies through the Model Project for Improvement of the Water Environment in Asia, we will aim to improve the water environment of developing countries in Asia and promote the overseas development of Japan's excellent technologies.

(3) Conservation of soil environment

In order to promote appropriate risk management regarding soil contamination and prevent its impact on human health, we will promote appropriate investigations and countermeasures for soil pollution in accordance with the Soil Contamination Countermeasures Act. With regard to the Act, the implementation status of the Act Partially Amending Soil Contamination Countermeasures Act (Act No. 33 of 2017) enacted in May 2017 should be inspected, and new measures will be considered as necessary.

In accordance with the Act on Special Measures against Dioxins (Act No. 105 of 1999) for soil contamination by dioxins, and the Act to Prevent Soil Contamination on

Agricultural Land (Act No. 139 of 1970) for soil contamination of agricultural land, necessary measures will be promoted.

(4) Conservation of marine environment

(i) Measures against marine litter

Under the international agreement and ambitions regarding marine litter and plastic pollution, we will promote the enhancement of comprehensive resource circulation system covering the entire life cycle of plastic products from their design to waste disposal, based on the Plastic Resource Circulation Act and other relevant laws and regulations, as well as comprehensive and effective measures against articles that drift ashore based on the Act on Promoting the Treatment of Marine Debris Affecting the Conservation of Good Coastal Landscapes and Environments as well as Marine Environments to Protect Natural Beauty and Variety. To be specific, we will implement measures such as grasping the actual status of the amount and distribution of marine debris, including microplastics, discharged into the environment, including oceans and rivers, the accumulation of scientific findings on the impact of marine plastic debris, including microplastics, on living organisms and ecosystems, providing financial support to the collection and treatment of marine litter and the control of its generation conducted by local governments (including the collection and treatment of marine debris generated in large quantities due to major natural disasters), and implementing awareness-raising activities by various entities in the region, including local governments, companies, fisheries businesses, and residents, and expansive cooperation and public relations activities in the Seto Inland Sea. Measures to collect drifting waste utilizing marine environment improvement vessels will also be implemented. In addition, as international cooperation also covering responses to marine litters of foreign origin, we will promote the harmonization of monitoring methods for microplastics in the marine surface layer, development of data sharing systems, and cooperation in Asia and other regions in terms of the understanding of the actual status of marine litter including plastics and the control of its generation.

(ii) Prevention of marine pollution

Based on the Act on Prevention of Marine Pollution and Maritime Disasters (Act No. 136 of 1970), which is the domestic guarantee for the 1996 Protocol to the London Convention, the International Convention for the Control and Management of Ship's Ballast Water and Sediments, the International Convention for the Prevention of Pollution from Ships

(MARPOL 73/78), and the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), we will appropriately implement measures such as the adequate operation of issuing permits related to dumping waste at sea, inspection of ballast water management systems, assessment of liquid substances not assessed, and the development of a discharged oil control system. In order to prevent the proliferation of marine pollution caused by oil spills from ship accidents, etc., the recovery of oil spills will be implemented in cooperation with relevant organizations, including the use of large dredging and oil recovery vessels. Furthermore, we will promote the accumulation of marine environmental data and scientific findings in the ocean areas surrounding Japan, and the establishment of international coordination and cooperation through participation in the Northwest Pacific Action Plan (NOWPAP), etc. With regard to carbon dioxide capture and storage (CCS), given that private businesses are expected to implement CCS projects by 2030, we will promote the development of environmental conservation-related systems so that sub-seabed CCS will be implemented appropriately and promptly in harmony with the preservation of the marine environment.

(iii) Promotion of monitoring and research on the marine environment

We will conduct marine environmental monitoring surveys to investigate bottom sediments, bioaccumulation, biological communities, etc. in the ocean areas surrounding Japan, environmental monitoring surveys of radioactive materials as a response to the Great East Japan Earthquake, and the understanding of the effects of rising sea water temperatures, ocean acidification, etc. on the marine environment and marine ecosystems.

(5) Conservation of air quality

(i) Measures regarding nitrogen oxides, photochemical oxidants, PM2.5, etc.

We will continue to appropriately implement countermeasures against fixed sources and mobile sources based on the Air Pollution Control Act. Measures will be taken to understand the actual emissions of photochemical oxidants and Nitrogen oxides (NOx) and volatile organic compounds (VOC) causing PM2.5, collect scientific findings, while paying economic and technical considerations, as well as looking at how emission control technologies are developed and disseminated.

In particular, with regard to photochemical oxidants, based on the working-plan for the countermeasure against photochemical oxidant, we will re-evaluate environmental standards regarding the impact on human health, conduct scientific studies focusing on

climate change, examine new measures to reduce the concentration of photochemical oxidants, steadily promote various measures based on scientific findings, and improve the rate of the achievement of environmental standards for photochemical oxidants.

Since measures to reduce photochemical oxidants and PM2.5 may be effective not only in protecting human health but also in combating climate change by reducing short-lived climate pollutants (SLCPs) such as ozone and black carbon (BC), optimal measures should be considered to make comprehensive efforts.

A. Fixed source measures for soot and smoke

The possibility of additional emission control measures will be considered, taking into account the status of emission controls under the Air Pollution Control Act, as well as scientific findings and the development and diffusion of emission control technologies, while paying due consideration to economic and technological aspects.

B. Measures against mobile sources

In addition to promoting the replacement with vehicles using clean energy such as electrified vehicles, we will continue our efforts to further improve the air environment by reviewing the permissible limits of motor vehicle exhaust emissions (motor vehicle exhaust emission regulations) in consideration of the actual driving conditions of vehicles in Japan and harmonization with international standards, and by promoting studies based on the "Report on the Future Comprehensive Measures for Automobile Emissions" (April 28, 2022) issued by the Central Environment Council.

C. VOC countermeasures

By promoting the understanding of the actual status of VOC emissions, etc., we will study effective VOC emission control measures and continue to promote emission control measures based on the best mix of regulations under the Air Pollution Control Act and voluntary efforts.

D. Monitoring, observation, and research

Based on the Air Pollution Control Act, the national government and prefectures, etc. conduct constant monitoring in order to grasp the status of air pollution from a nationwide perspective and to obtain basic data necessary for the promotion of air quality preservation measures, etc. We will continue to provide the public with easy-to-understand information on the data collected in real time (preliminary data) through

the Atmospheric Environmental Regional Observation System (AEROS) ("Soramame"). In addition, we will continuously conduct monitoring aimed at understanding the long-term effects of acid rain, yellow sand, and transboundary air pollution, as well as radioactive materials monitoring and surveys related to measurement methods for microplastics in the air.

(ii) Prevention of health effects from various hazardous substances

A. Measures to prevent the scattering of asbestos

Regarding the demolition of buildings in which asbestos-containing building materials are used, we will not only take thorough measures to prevent scattering through the appropriate application of the Air Pollution Control Act, but also promote the dissemination and education of appropriate measures to stakeholders, including those who place orders for demolition work and those who receive the orders, in accordance with their respective roles. In addition, we will ensure that there are enough inspectors of building materials containing asbestos who conduct preliminary inspections of demolition of buildings and promote the training of such inspectors. Furthermore, local governments will be supported in their efforts to identify the status of the use of asbestos in buildings, organize it into a database, and establish a system for sharing it with relevant departments in preparation for disasters.

In order to grasp the status of air pollution caused by asbestos, the concentration of asbestos in the air is measured, and necessary measures are considered while taking into account the enforcement status of the Air Pollution Control Act.

B. Measures to control atmospheric emissions of mercury

Control of the atmospheric emissions of mercury will be steadily implemented based on the revised Air Pollution Control Act in light of the Minamata Convention on Mercury. In addition, measures are promoted to control atmospheric emissions of mercury by collecting and organizing information on the status of efforts to control the atmospheric emissions of mercury in cooperation with local governments and related organizations, such as by preparing inventories on the atmospheric emissions of mercury and following up on facilities that require voluntary efforts to control emissions, and considering new measures as necessary.

C. Measures against hazardous air pollutants, etc.

We will continuously implement appropriate measures to reduce the emissions of hazardous air pollutants in accordance with the Air Pollution Control Act, and collect new information and consider further measures as necessary. In addition, we will continue to collect knowledge on health effects, atmospheric concentrations, sources, control technologies, etc., including new chemicals such as POPs, and set and re-evaluate environmental targets and discuss effective measures for preventing health hazards, based on scientific findings and the results of monitoring, while setting priorities according to the situation.

Furthermore, the promotion of voluntary efforts by businesses to curb emissions and efficient monitoring by local governments will be implemented.

(iii) Efforts to conserve the local living environment

A. Measures against noise and vibration

a. Measures against noise and vibration for automobiles, Shinkansen railway, aircraft, etc.

The review of the permissible limit of automobile noise (automobile specific noise regulation) will be studied in consideration of the actual driving conditions of vehicles in Japan and harmonization with international standards, including the impact of increased tire noise due to the electrification of vehicles, We will engage in preventing noise and vibration by measures such as vehicle noise reduction, road structure measures, traffic flow measures, and measures for those exposed to noises such as soundproofing of residences, as well as understanding the situation, improving the accuracy of measurements, and providing information on measurement results.

b. Measures against the noises of factories, business sites, and construction work

The latest findings will be collected and analyzed to study evaluation methods for noise and vibration. Further, in addition to the conventional regulatory measures, efforts will be taken on the source side using informational and voluntary measures, based on the latest technological trends.

c. Low frequency sound and other countermeasures

We will accumulate scientific findings necessary to consider countermeasures for new noise problems to which conventional environmental standards and regulations are not necessarily applicable. Concerning noise and low frequency sound generated from wind power generation facilities and household equipment, we will

continuously implement surveys and research on unresolved issues such as its generation and propagation, causal relationships with health effects on residents in the vicinity, pure tone components that are said to cause annoyance, impact and cumulative effects of larger wind power generation facilities, etc., and actively disseminate necessary information. In addition, we will consider methods to appropriately study, predict, and assess the impact of noise and low frequency sound generated by these facilities on the living environment.

B. Measures against odors

With regard to measures against odors, we will collect knowledge and review measurement methods based on technological trends. At the same time, we will promote technical support and dissemination of information to local governments, etc.

C. Measures against light pollution

Regarding measures against the adverse effects of inappropriate and inconsiderate use of outdoor lighting, etc. (light pollution), we will monitor the status of technological development and domestic and international trends, and where necessary, review the guidelines for measures against light pollution, and promote public awareness. In addition, we will promote star observation and encourage people to take a deeper interest in the conservation of the air environment.

(iv) Promotion of air quality conservation in Asia

We will promote air pollution control measures through various bilateral and multilateral cooperation to improve the situation of air pollution in the Asian region.

A. Bilateral cooperation

To promote the co-benefit approach for improving the situation of air pollution and reducing greenhouse gas emissions by proposing, implementing, evaluating, and expanding the use of Japanese technologies to address air environment issues in the Asian region.

B. Cooperation under the Tripartite Environment Ministers Meeting among Japan, Korea, and China (TEMM)

Promote policy dialogue on air pollution among the three countries, and joint research on yellow sand by the 3+X, which includes Mongolia, to improve policies and technologies of the three countries.

C. Multilateral cooperation

We will promote the co-benefit approach to combating air pollution and climate change in collaboration with the United Nations Environment Programme (UNEP), Clean Air Asia (CAA), International Institute for Applied Systems Analysis (IIASA), and utilizing international frameworks such as the Acid Deposition Monitoring Network in East Asia (EANET), which has expanded its scope to include all air pollutants, the Asia EST Regional Forum, and Joint Crediting Mechanism (JCM), to promote international cooperation such as sharing of Japan's knowledge and experience, technology transfer, and capacity building.

(6) Cross-media measures

Japan will promote sustainable nitrogen and phosphorus management that contributes to societies and regions by taking an integrated approach to conservation and management of the water and atmospheric environment, decarbonization, resource circulation and symbiosis with nature. Specifically, Japan will take measures to address nitrate nitrogen and nitrite nitrogen in groundwater, which continue to exceed environmental standards, and eutrophication in lakes, which also serve as sources of drinking water, through proper fertilizer application, expansion of the use of compost and fertilizer made from sewage sludge resources, energy use of livestock manure and sewage sludge resources. In addition, in the development/use of ammonia for fuel, hydrogen carriers, and other applications that are expected to expand in the future, Japan will facilitate the avoidance of NOx and N2O emissions by utilizing technologies that do not increase NOx emissions. Furthermore, Japan will promote proper nutrient management to achieve a "Clean and Rich Sea."

Japan will also continue to elaborate the nitrogen inventory and consolidate scientific knowledge, and formulate Japan’s National Action Plan on Sustainable Nitrogen Management. Finally, we will contribute to international nitrogen management by sharing Japan’s experience with Asian developing countries, where nitrogen consumption is increasing rapidly.

(7) Creation of a good environment

In addition to promoting the measures listed in Part 2, Chapter 3, 4 (1) (iii), we will collect and streamline information on the various public functions of soil in the environment, such as carbon storage and water source recharge, in a form that can be easily utilized for better community development, while also targeting urban areas.

(8) Fundamental efforts on the environmental conservation and regeneration of water, soil, ocean, and air

(i)Environmental management through the use of digital technology

Regarding the regulations related to measurement, inspection, etc. in the environmental management field, human intervention in the environmental management field, such as real-time monitoring, will be reviewed in accordance with the Digital Principles formulated by the Digital Temporary Administrative Research Committee in December 2021. In addition, administrative procedures related to environmental management laws and regulations will be made online to improve convenience for citizens and businesses.

(ii) Development of analytical techniques and precision control

We will maintain and improve the accuracy of the measurement and analysis by environmental measurement and analysis organizations (municipalities and private organizations), and consider reviewing analysis methods, including official methods, in light of the supply shortage of helium gas for analysis and the latest technological trends.

(iii) Disaster response

In the event of an accident related to water pollution or air pollution caused by natural disasters, we will promptly assess the situation and take thorough measures to cope with accidents in cooperation with local governments, based on the Water Pollution Prevention Act, Air Pollution Control Act, etc. Necessary measures will be taken from the perspective of strengthening safety measures regarding tap water quality and measures to prevent asbestos from scattering in the event of a disaster.

5. Efforts regarding comprehensive measures against chemicals

In order to minimize environmental risks throughout the life cycle of chemicals, we will promote chemicals management in the environmental field from an international perspective, in line with the GFC described in Part 2, Chapter 3, 4 (2). Regarding GFC, we will promote the formulation of the domestic implementation plan after exchanging

opinions with various entities, including relevant ministries and agencies, citizens, workers, businesses, administrative bodies, and academic expert, and also contribute to the promotion of efforts in the Asian region as a focal point for the Asia-Pacific region.

(1) Legal framework, institutional mechanisms and capacity building for the management of chemicals throughout their life cycle

We will continuously make efforts for the smooth implementation of the screening assessment of general chemicals and the risk assessment of priority assessment chemicals, based on the Act on the Regulation of Manufacture and Evaluation of Chemical Substances (Act No. 117 of 1973, hereinafter referred to as the "Act on the Regulation of Chemical substances Evaluation"), and ensure the appropriate confirmation and management of the progress through the joint council of the relevant ministries. With regard to the evaluation of chemicals, we will promote research and development of new evaluation methods (NAMs), which are being studied in Europe and the U.S., in Japan, and consider appropriate measures for their use in various laws/regulations and systems.

In addition, since the Supplementary Provisions at the time of the amendment of the Act in 2017 stipulates to review the Act after five years have passed since its enforcement, the relevant ministries and agencies will take necessary actions in close cooperation, while taking into account the status of the enforcement of the Act.

Regarding the PRTR system and the SDS system based on the Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement (Act No. 86 of 1999), we will promote the voluntary improvement of the management of chemicals by businesses and prevent hindrances to environmental conservation through the review of the systems based on the latest scientific findings and domestic and international trends and their appropriate operation.

With regard to the response to the Minamata Convention on Mercury, given that the provisions of the Convention cover the entire life cycle of mercury and mercury compounds from mining to disposal, comprehensive mercury control measures based on the Act on Preventing Mercury Pollution of the Environment (Act No. 42 of 2015), etc., should be steadily promoted in Japan.

As for pesticides, from the perspective of contributing to the preservation of the living environment of the public, new risk assessment methods should be developed to detect effects from long-term exposures in addition to the conventional risk assessment of acute effects on plants and animals in the living environment, to improve ecological risk assessment used currently for the pesticide registration system. In addition, the re-evaluation of previously registered pesticides and the monitoring of river water for pesticides that are considered to have high ecological risk will be steadily conducted.

As for unintentionally generated dioxins, measures based on the Act on Special Measures against Dioxins (Act No. 105 of 1999) will continue to be promoted appropriately.

To prevent environmental pollution due to the release or discharge of hazardous substances, we will promote information sharing on hazardous substances, monitoring and prevention of proliferation at the time of release or discharge, and other measures to prevent the spread of hazardous substances.

(2) Ensuring the state that allows the creation and use of knowledge, data, and information supporting informed decision-making and actions, and their accessibility

(i) Promotion of the sharing, generation, and disclosure of comprehensive data and information, as well as education, training and awareness raising

We will communicate with the public, businesses, and governments while sharing accurate information on the risks and benefits of chemicals. Specifically, partnerships through "Policy Dialogues on Chemicals and the Environment," human resource development and environmental education for all entities, efforts by each entity to improve their understanding of chemicals and environmental risks, and collaboration among entities will be promoted.

In order to promote the sharing of information throughout the value chain and supply chain, we will promote the development and utilization of standards such as chemSHERPA, GADSL, industry guidance documents on the management of chemicals in products, and J-Moss, and consider the introduction of a mechanism to also handle information on hazardous chemicals within the framework and initiatives to check sustainability information of products throughout their life cycle, such as the Digital Product Passport (DPP) in Europe.

Data on emissions and transfers obtained through the PRTR system will continue to be made public while ensuring their accuracy and reliability, and will be used for risk assessment and other purposes. Such information as well as data obtained from environmental monitoring will be utilized to prepare for disaster damage prevention from ordinary times.

Furthermore, while making efforts to understand information related to the revision of the UN GHS document, we will continue to collect information on environmental hazards, etc. of chemicals that have not yet been classified under the GHS or whose information needs to be updated, and then implement the GHS classification in cooperation with the relevant ministries by utilizing the hazard and toxicity information on chemicals held by the private sector on its own. As efforts are being made to create voluntary GHS labeling guidelines by industry groups regarding the provision of information to consumers, efforts will be made to support small and medium-sized enterprises (SMEs) through the promotion of the use of the Chemical Advisor system.

We will promote risk communication, including the above, and communicate through the exchange of opinions to manage and reduce risks in a more rational manner.

(ii) Risk assessment, waste management guidelines, best practices, standardization tools, etc.

Administrative efforts to control chemicals are required to be based on scientific evidence. Therefore, working to accumulate such findings, we will move forward with improving the efficiency and sophistication of risk assessment, as well as with conducting survey research on unresolved issues, thereby leading to detailed understanding of environmental risks and their reduction.

On the other hand, scientific uncertainty should not be a reason for delaying measures to tackle problems that may cause extremely serious environmental problems. Effort should be made to enhance scientific findings and to take preventive measures.

Through collaboration among relevant ministries and agencies, we will investigate and study methods that enable the risk assessment of chemicals throughout their life cycle, from production to disposal, with the aim of putting them to practical use.

Risk assessment of existing chemicals based on the Act on the Evaluation and Regulation of Chemical substances should be conducted. Those found to cause risks should be designated as Class II Specified Chemicals, and the necessary measures shall be taken.

In addition, while taking into consideration the actual state of chemicals in the environment, we will narrow down the group of substances that may affect human health and the environment, such as substances that are unintentionally produced by combustion or decomposition of chemicals in the environment, and substances for which the routes of discharge to the environment or exposure to humans are not clear, and use literature information and monitoring results to conduct an initial risk assessment, and disclose the results thereof.

Based on the results of risk assessment, consistency in risk management methods at each stage of the life cycle should be ensured, while studying the review of such methods as necessary. In particular, in the recycling and disposal stages, based on the Fundamental Plan for Establishing a Sound Material-Cycle Society, we will further promote appropriate information communication by ensuring the balance between resource circulation and chemicals management, thoroughly implementing extended producer responsibility, designing environment considerations from the product manufacturing stage, and disseminating the Waste Data Sheet (WDS).

In addition, in coordination with measures taken under the Waste Management Act, such as the promotion of WDS, and by utilizing the information provided at the time of waste disposal consignment, we will prevent accidents in the disposal process and promote proper disposal of waste.

(iii) Exposure monitoring

Efficient use of various types of monitoring will be promoted. Specifically, we will establish an appropriate risk management system by clarifying environmental effects that chemicals in the environment have on the health of children, by conducting a large-scale and long-term Birth Cohort Study, targeting approximately 100,000 mother-child pairs for the purpose of leading to a safe and secure child-rearing environment.

In addition, research on chemicals countermeasures will be promoted by various institutions including local environmental research institutes, and reliable and efficient

implementation of surveys including monitoring will be carried out, followed by systematic organization and management of the accumulated survey data.

We will continuously implement various environmental surveys and monitoring necessary for implementing measures related to chemicals, while improving survey techniques, including issues for each measure and analytical methods, while reflecting the results in survey methods and systematically organizing the accumulated survey results as appropriate.

Necessary information such as monitoring results that contribute to the evaluation of the effectiveness of the Stockholm Convention on Persistent Organic Pollutants will be securely collected.

In addition, we will promote surveys on concentrations in blood and other biological samples over time that can ensure representativeness of exposure to chemicals in the general population as a whole.

(3) Addressing issues of concern

Perfluoroalkyl substances and polyfluoroalkyl substances (PFAS) are becoming of growing social concern from the perspective of protecting human health, and various scientific discussions are being held internationally on their target values, standards, and management methods. Therefore, blood concentration surveys and environmental monitoring will be conducted to understand changes in terms of the exposure of the general public to PFAS over time, in addition to continuously collecting knowledge on health impacts through the Japan Environment and Children's Study (JECS). The results obtained will be disseminated and shared among relevant ministries, agencies, and local governments as necessary, and cooperation will be made so that the results can be linked to chemicals management measures.

Regarding the endocrine-disrupting effects of chemicals, we will complete the test methods to be used under EXTEND 2022, and accelerate testing and evaluation, including the consideration of starting tests and evaluation using the new test methods that have been established. We aim to actively address pesticides, pharmaceuticals, and other PPCPs as substances to be considered, and to propose measures for the assessment

of endocrine-disrupting effects with a view to their utilization in the assessment system under the risk management system.

Regarding new approach methodologies (NAMs) that are being researched in Europe and the United States, Japan will also promote research and development and consider appropriate ways to utilize them under various laws, regulations, and systems. In addition, with regard to the development and utilization of new assessment methods such as QSAR and toxico-genomics, including AOP (Adverse Outcome Pathway) being studied overseas, we will actively participate in OECD efforts and utilize their results, while continuing our efforts to actively promote studies on the development and utilization of these assessment methods in Japan.

With regard to the assessment of the effects of multiple chemicals (so-called "combined effects assessment"), while focusing on the similarity of the structure and the identity of the mechanism of action of the substances, the collection of knowledge and the implementation of a trial assessment will be promoted, and guidance will be prepared for the environmental administration to conduct combined effects assessment of chemicals. We will provide these findings to the existing risk assessment system in order to promote combined effects assessment.

Regarding nanomaterials, we will actively participate in the efforts of the OECD to accumulate knowledge on their environmental risks. We will also work to enhance our knowledge on the group of new substances of concern, such as advanced materials, which have been focused on by the OECD.

For pharmaceuticals and personal care products (PPCPs) present in the environment, we will enhance our knowledge on their ecotoxicity and status of presence, focusing on their effects on organisms in the environment, and promote environmental risk assessment.

With regard to antimicrobial resistance (AMR), based on the fact that the Joint Communiqué of the G7 Ministers' Meeting on Climate, Energy and Environment in Sapporo (2023) clearly states that efforts should be continued to fill knowledge gaps from the perspective of One Health approach, we will promote the collection of basic information on the state of antimicrobial agents remaining in the environment, and studies focusing on their impacts on human health and organisms.

With regard to pollution by chemicals such as plastic additives, we will closely monitor developments in discussions at the Intergovernmental Negotiating Committee (INC) and other forums to develop an international legally binding instrument (treaty) on plastic pollution, and take appropriate action as necessary.

(4) Preventing and minimizing environmental risks through the development of safer alternatives and innovative and sustainable solutions in the product value chain

We will promote constant consideration of minimizing environmental risks throughout the life cycle of chemicals, from their manufacturing to use, circulation, and disposal. From such perspective, we will further improve collaboration with the efforts of each relevant entity by promoting Design for Environment (DfE), substitution to more environmentally-friendly chemicals, support for the initiative of green and sustainable chemistry, support for risk assessment (e.g., development of exposure assessment infrastructure including that for the time of circulation), support for voluntary management based on the Act on the Promotion of Chemical substances Management, and appropriate management of inventories in town, aiming at managing chemicals throughout the process from production to disposal.

In Japan, chemicals have traditionally been managed based on compliance with laws and regulations and voluntary efforts by individual companies. In recent years, many institutional investors are focusing on the environmental considerations of companies as one of the most important factors in investment, such as ESG investment. In this regard, we will promote the establishment of a framework such as the development of evaluation indicators that provides incentives for companies to take a better direction, so that companies making advanced efforts also in terms of chemicals are evaluated properly.

(5) Strengthening of implementation through effective resource mobilization, partnerships, cooperation, capacity building and integration into relevant decision-making processes

We will communicate with the public, businesses, and governments while sharing accurate information on the risks and benefits of chemicals. Specifically, partnerships through "Policy Dialogues on Chemicals and the Environment," human resource development and environmental education for all entities, efforts by each entity to

improve their understanding of chemicals and environmental risks, and collaboration among entities will be promoted.

We will continuously promote measures, including the sharing of Japan's experience in chemicals management, to strengthen chemicals management in emerging countries, etc. and to coordinate international chemicals management.

In the Asian region in particular, in order to prevent environmental pollution and health hazards caused by chemicals, Japan will promote the appropriate management of chemicals, harmonization of systems and methods therefor, and the establishment of cooperative systems, through different frameworks to support capacity building for measures regarding chemicals, such as various monitoring networks, the Tripartite Environment Ministers Meeting, and the Asia Pacific Regional Forum on Health and Environment, through the active transmission of information based on the experiences and technologies of Japan, international cooperation, and technical assistance.

We will actively lead the implementation of the Minamata Convention on Mercury as an advanced country in mercury countermeasures, including effectiveness assessment, and contribute to the implementation of the Convention in developing countries and other countries in cooperation with international organizations, while utilizing Japan's technologies and knowledge.

In addition, international cooperation on clarifying the impact of chemicals on children's health will be promoted.

(6) Dealing with negative legacies

In order to complete the disposal of PCB waste as soon as possible, the Ministry of the Environment will continuously promote awareness-raising activities among storage operators and other stakeholders, and further cooperation among the Ministry of the Environment, JESCO, prefectural and city governments, the Ministry of Economy, Trade and Industry, other relevant ministries and agencies, businesses, and other relevant organizations.

In addition, based on the cabinet understanding on June 6, 2003 and the cabinet decision on December 16, 2003, environmental surveys to prevent damage from former military

poison gas bombs will be steadily conducted in cooperation with relevant ministries and agencies, and with the cooperation of local governments. In addition, the Poisonous Gas Information Center established within the Ministry of the Environment will continuously collect information and disseminate the aggregated information and general points to keep in mind.

Chapter 2 Measures that form the basis for various measures and measures related to international initiatives

1. Formulation of a green economic system

(1) Expansion of environmental business and mainstreaming of environmental considerations in corporate strategy

In order to build a green economic system, it is necessary to encourage the mainstreaming of environmental considerations in corporate strategies. In specific, promotion of environmental management, understanding and promotion of new business models such as the servicizing and sharing economy, promotion of green purchasing and green contracts, and the promotion of exporting green products and services will be implemented.

(2) Formulation of a green economic system through finance

In order for the environment, economy, and society to develop together and achieve sustainable economic growth, it is important to develop a long-term investment environment and promote sustainable finance, including ESG finance. Therefore, we will promote understanding on ESG information among relevant parties, including investors, and at the same time encourage more companies to disclose environmental information and improve the quality of that information to improve corporate value. In order to attract private investment in projects that contribute to solving environmental issues, we will provide appropriate incentives to promote environmental considerations and environmental projects through finance by supporting environmental projects where private funds are not sufficiently supplied, and by supporting financing through green bonds and green loans, to promote the greening of finance.

(3) Tax system as the basis of green economic system

Promoting greening of environment-related taxation systems conducive to decarbonization, circular economy, and nature restoration is an important program to build the basis of the green economic system because it leads to the further promotion of environmental conservation through incorporating environmental considerations into the actions of various stakeholders including companies and citizens. We will promote

greening of the whole tax system, through synthetic and systematic survey and analysis of environmental and other effects from environment-related taxes, while considering the situation of foreign countries.

Using tax revenue from the special tax measure of the Petroleum and Coal Tax for climate change mitigation, we will steadily implement measures to control energy-originated CO2 emissions.

2. Enhancement of technology development, research and study, monitoring and observation, etc.

(1) Measures for the development and demonstration of science, technology and innovation and their social implementation

(i) Promotion of integrated environmental research and technology development

We will conduct research and development that contributes to the establishment of decarbonized society, a sound material-cycle society, and society in harmony with nature, and research and development that contribute to ensuring safety. In addition, with understanding on the international needs for biocapacity and the domestic and regional needs for demand-side lifestyles, we will aim to create innovations based on the essential needs of the citizens now and in the future, and will conduct research and technology development in the fields of materializing the integrated improvements on environment, economy and society (II2ES), net-zero, circulation economy, and nature-positive, and in multiple fields, as well as research and technology development that contributes to safety and security, and research and technology development that contribute to the utilization of total knowledge including not only natural science but also humanity and social science.

In doing so, we will place particular focus on the following research and technological development efforts, and apply the results to society.

We will promote integrated policy research based on environmental, economic, and social perspectives in order to constantly pursue an ideal state of society based on medium- to long-term visions that aim to realize net-zero, circular economy, and nature-positive.

In order to realize such a society, we will conduct research on various environmental issues that require new approaches in Japan and abroad, such as decarbonization, resource

circulation, harmony with nature, and safety and security, and the interrelationship between the environment and the economy from the perspective covering all of these issues, economic evaluation methods for environmental values, and methods for evaluating the economics of policies by introducing regulation, deregulation, and economic methods, to provide a foundation for planning, formulating, and promoting policies based on objective evidence. In the process of reflecting the results of this policy research in policy planning and formulation, we will promote the training of researchers who will also be involved in policy formation, through the participation of relevant researchers at each stage.

The development of win-win technologies that address multiple issues simultaneously, such as net-zero, circulation economy, and nature-positive, and the development of technologies to resolve trade-offs among issues that prevent the realization of simultaneous solutions to multiple issues, as well as issues that cover multiple fields and are common to all fields, will also be promoted with higher priority from the perspectives of cost reduction and the explosive diffusion of R&D results into society. With regard to digital technologies such as AI and IoT, advanced science and technology such as quantum, advanced material and monitoring technologies, DX-related technologies, technologies that contribute to economic security, and elemental technologies that are required across fields, not only the technologies themselves will be developed but also their utilization in individual R&D will be actively promoted.

(ii) Measures to effectively promote environmental research and technology development

In order to implement research and development securely and effectively, measures according to the following strategy will be implemented.

A. Promotion of research and technology development through collaboration among various entities

In order to optimize the overall technological package and economic and social system, not only should we promote research and development that spans multiple fields of research and technological development, but we should also constantly monitor the trends of other research and development in Japan and abroad even for individual studies within a single area, and how such research and development will be reflected in society.

To this end, for those who are engaged in research and development, we will promote further collaboration among industry, academia, and government, between ministries and agencies, and between the national and local governments, as well as collaboration not only within the same fields but also across different academic disciplines, industries, and business sectors. Efforts will also be made to create an international framework and collaboration with the Asia-Pacific and other regions. In doing so, the national government and local governments, including related research institutions, should not only conduct research and development on their own, but also enhance support for research and development that provides assistance to collaboration among research institutions and incentives to private companies, universities, and other research institutions working on environmental technology development.

B. Promotion of efforts to disseminate environmental technologies

In order to demonstrate, implement, and disseminate excellent environmental technologies resulting from research and development, we will combine all kinds of policy measures, including new regulations and deregulation, economic measures, voluntary measures, use of special zones, and the promotion of innovation through seamless support for environmental start-ups, etc., as well as promoting the internalization of social cost due to environmental load (external diseconomies) and to addressing future risks, such as resource and environmental constraints, from a precautionary perspective, to encourage research and development based on the essential needs of the citizens now and in the future, as well as to stimulate demand for environmental technologies. Efforts will also be made to support the diffusion of individual technologies by expanding the seeds of technologies, such as the introduction of technology assessment and the granting of credit.

C. Easy-to-understand dissemination of achievements and citizens' participation

Providing the achievements of research and development in an easy-to-understand and open manner is fundamental for establishing policies that contribute to solving environmental problems for those involved in policy making. To this end, we will implement easy-to-understand information dissemination that goes back to questions such as "why the research was necessary," "what the results were," and "how it will contribute to solving environmental problems." In addition, while actively utilizing the website, symposiums, PR magazines, observation tours, etc., we will further strengthen the promotion of the understanding of the achievements of the research by widely disseminating them to the public and allowing dialogues with relevant parties, in order

to achieve a change in awareness of environmental issues and behavior towards realizing citizens' participation in environmental policies and sustainable lifestyles.

D. Enhancement of evaluation in research and development

In the evaluation of research and development, the PDCA cycle should be established, and the achievement targets, plans, and implementation systems for policies and measures should be clearly set and promoted. The progress of research and development and the degree to which research results have been reflected in policies and measures will be followed up in a timely and appropriate manner through a combination of preliminary, interim, ex-post, and follow-up evaluations, and plans and policies will be reviewed, resources will be allocated, and the plans for new policies will be made based on the past achievements.

E. Establishment of a superior position in global environmental business by building a digital platform

With the progress of new information technologies such as AI, IoT, and big data, platform businesses in the digital field where data is accumulated and utilized are being created in various industrial sectors, having an impact on the industrial structure. Regarding the digital platform, development of the trade environment is being promoted internationally, and Japan needs to urgently develop the basic concepts and rules for data distribution, personal information protection, information security, transparency and fairness. It is important to foster digital platform businesses for resolving social issues and as a driving force for growth, leading to the advancement of innovation and activation of markets, while ensuring safe and secure data utilization through sophisticated coordination between cyber-space and physical space.

In the data-based platform business, the quality and quantity of data may directly lead to its value and competitive advantage. Thus, also in the environmental business, it is necessary to establish a mechanism to link and distribute data among domestic entities beyond the borders of companies and industries, in order to fully utilize the valuable data generated at each stage of manufacturing and distributing supply chain. We will then respond to the needs of users and contribute to improving market access for businesses and the convenience of consumers.

F. Contribution to international frameworks and international standardization (intellectual property strategy)

We will promote international collaboration on environmental issues through contributions to international frameworks and multilateral and bilateral cooperation in order to utilize and disseminate environmental technologies in which Japan has advantages.

In strengthening Japan's international competitiveness, attention should be paid to the open-close strategy of technical information related to intellectual property. In particular, in order for environmental technologies, in which Japan has an advantage, to be utilized and diffused, it is important not only to make technical information available to everyone, but also to standardize the information as a method to realize outbound open innovation, whereby technology is put forward to the outside world to cause innovation. Cooperation with other countries is essential to promote international standardization and international rule formation related to environmental technologies. By sharing scientific findings and data and through policy dialogues, we will conduct strategic coordination and cooperation according to the situation of counterpart countries and organizations, and contribute to the implementation of environment-related treaties in developing countries and other countries.

(2) Effective implementation of monitoring and observation in the public and private sectors

Steady implementation of monitoring and observation will be carried out in accordance with individual laws and regulations. In addition, expansive and global monitoring and observation will be conducted under international collaboration while paying attention to the openness and closeness of information. To this end, efforts will be made to advance the science and technology related to monitoring and observation, and to improve the implementation system. In addition, in order to ensure proper implementation of surveys and measurements in the private sector and to improve their reliability, we will enhance the provision of information and promote the use of qualification systems, such as that for professional engineers (in the environmental sector, etc.).

(3) Environmental considerations in technological development

In cases where there is a foreseeable risk of environmental impact associated with the development and use of new technologies, appropriate measures must be taken to ensure that the impact on the environment is fully considered from the technological

development stage and that necessary environmental considerations are made from the perspective of prevention. When any new risks to the environment are identified as a result of the enhancement of scientific findings, even when the scientific ground is insufficient or uncertain, appropriate measures should be taken to ensure that necessary considerations are made from the perspective of the prevention principle and preventive measures, based on the best scientific findings available at that time.

3. Measures regarding international efforts

(1) Promotion of international cooperation for the conservation of global environment

(i) Diffusion of quality environmental infrastructure

Based on the Overseas Deployment of Integrated Infrastructure Systems 2025 (Supplemented in June 2023), we will promote the overseas deployment of high-quality environmental infrastructure to encourage environmental improvement and climate change countermeasures in developing countries, while also contributing to Japan's economic growth.

In addition, the Japan Platform for Redesign: Sustainable Infrastructure (JPRSI) will be utilized to provide total solutions for environmental infrastructure to overseas countries through cooperation between the public and private sectors, and further promote the overseas deployment of environmental infrastructure more strongly through initiatives related to inter-city cooperation to realize a decarbonized society and through the Joint Crediting Mechanism (JCM).

Furthermore, in order to ensure that appropriate environmental considerations are given to overseas projects as well, we will strive to improve environmental issues by providing support for cooperation with other countries, utilizing Japan's knowledge on environmental impact assessment, and by supporting initiatives based on guidelines such as JICA Guidelines for Environmental and Social Considerations.

(ii) Cooperation and collaboration with regional/international organizations

Strategic coordination and cooperation will be implemented according to the situation of counterpart countries and organizations. Specifically, Japan will deepen coordination and cooperation with each country through measures such as policy dialogues, and make

contributions to the G7, ASEAN, Pacific Island countries, Central Asia, South Asia, and African countries, in various fields of climate change and environmental measures and their integrated implementation, which will also lead to strengthening partnerships with these countries and regions.

We have actively contributed to the Strategic Program for ASEAN Climate and Environment (SPACE), which was inaugurated upon celebrating the 50th Year of ASEAN-Japan Friendship and Cooperation, as well as to the environment ministers' meetings based on regional frameworks such as Japan, China, and Korea, ASEAN, and the East Asia Summit (EAS). We will also promote collaboration with international organizations including the United Nations Environment Programme (UNEP), the Organization for Economic Development Organization (OECD), the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), International Renewable energy Agency (IRENA), Asian Development Bank (ADB), Economic Research Institute for ASEAN and East Asia (ERIA), the United Nations Department of Economic and Social Affairs (UNDESA), and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).

(iii) Active utilization of multilateral and private funds

Regarding multilateral funds, we will support the dissemination of superior decarbonization and low-carbon technologies, in particular through contributions to the Green Climate Fund (GCF), the World Bank, and the Global Environment Facility (GEF), as well as making contributions to the ADB and the United Nations Industrial Development Organization (UNIDO) for the formulation of Joint Crediting Mechanism (JCM) projects. In addition, to increase the mobilization of private-sector funds, the project will support efforts to promote investment in environmental infrastructure and projects.

(iv) Enhancement and strengthening of international networks among various entities

A. Cooperation among municipalities

The project will support inter-municipal cooperation efforts implemented on an international basis by Japanese local governments, and encourage capacity building through mutual learning among local governments. In addition, by utilizing the experience and know-how possessed by Japanese local governments, we will support

efforts to establish institutions for decarbonization at the city level and efforts that lead to emission reduction projects under Joint Crediting Mechanism (JCM).

B. Cooperation at the grass-root level

In order to establish a sustainable society, it is important to build partnerships not only with the government and companies, but also with civil society, including NGOs and NPOs. To this end, we will continue to implement initiatives to share and disseminate information and knowledge held by the civil society.

(v) Serving a leading role in international frameworks

In order to establish the High Integrity Carbon Markets under a market mechanism in line with Article 6 of the Paris Agreement, including the Joint Crediting Mechanism (JCM), we will promote the Paris Agreement Article 6 Implementation Partnership to encourage the understanding and establishment of a system to implement Article 6 of the Paris Agreement, as well as contribute to further reducing global greenhouse gas emissions through the packages announced at COP28 for the purpose of supporting the efforts of each country to establish a system.

Japan has led the sharing of the Osaka Blue Ocean Vision at the G20 Osaka Summit and the agreement on the ambition to reduce additional plastic pollution to zero by 2040 at the G7 Hiroshima Summit. In such context, we will play a leading role in international negotiations, such as those for the development of an international legally binding instrument (treaty) on plastic pollution through the Intergovernmental Negotiating Committee (INC).

Furthermore, we will actively lead the implementation of the Minamata Convention on Mercury as an advanced country in mercury countermeasures, including effectiveness assessment, by utilizing technologies and knowledge of our country, and contribute to the implementation of the Convention in developing countries and other countries in cooperation with international organizations. We will also contribute to building consensus through negotiation on the establishment of science-policy panel in the fields of chemicals, wastes, and pollution.

4. Promotion of community and human resources development

(1) Promotion of community development centered on the environment

(i) Development of establishing Circular and Ecological Economy

In order to realize a self-reliant and decentralized society, it is important for local communities to take the initiative and utilize their natural capital, which is their strength, to promote the development of attractive regions, in other words, the creation of a Circular and Ecological Economy. In this process, it is also essential to develop human resources who can play a role in regional development in communities, so regional development and human resource development need to be pursued as two wheels on a single axle.

Therefore, we will develop regional platform operation entities and establish an intermediary support system and promote the establishment of various regional networks therefor, in order to create a regional platform for self-reliant regions that provide mutual support by building networks with other regions.

In addition, we will measure and transmit information on the impact that the creation of a Circular and Ecological Economy will have on the local environment, economy, and society, and award and diffuse excellent efforts in each region to encourage more regions to work on creating a Circular and Ecological Economy. In doing so, it is particularly important to understand the structure of regional economic circulation, and we will operate and update tools for this purpose.

In addition, since the economic and social structure is expected to change significantly in the process of transitioning to a sustainable society, we will target those regions and support their proactive efforts including the establishment of regional platforms to implement initiatives, including creating new industries with the environment at the core, sharing of visions and business concepts, and the creation of new businesses, based on the idea of a Circular and Ecological Economy, by minimizing the negative impacts of changes in economic and social structure.

(ii) Accelerating regional decarbonization

According to the Plan for Global Warming Countermeasures (cabinet decision on October 22, 2021), it is considered that regional decarbonization is an opportunity to contribute to resolving regional issues and improving the attractiveness and quality of the region by leveraging the strengths of the region as a local growth strategy. There is significant room for individuals to make efforts in their daily life to realize decarbonization with the technologies that are available today. Since it takes time for regional public infrastructure,

structures, and energy supply infrastructure with long life spans for transition to a decarbonized type, it is necessary to start taking actions from now. In light of this, it is important to realize regional decarbonization by promoting industrial and social structural shifts and the creation of stable demand for decarbonized products in collaboration with regional financial institutions and local businesses, by also considering regional characteristics and utilizing the ideas of local governments, in order to lead the country's overall transition to decarbonization from the local level.

To this end, in addition to promoting the measures described in Part 2, Chapter 2, 3 (1), local governments, through financial, technical, and information support by the government, will take the initiative as priority measures to accelerate regional decarbonization, in implementing priority measures that will serve as the foundation for regional decarbonization (introduction of renewable energy benefiting in regional symbiosis, introduction of ZEB in public facilities, introduction of electrified vehicles in public vehicles, etc.) regarding all office work and projects including those by publicly owned companies. At the same time, they will further accelerate efforts to shift to a circular economy through the advancement of resource circulation led by businesses and residents, compact plus network, and compatibility between the improvement of productivity and the sustainability of food, agriculture, forestry, and fisheries industries. For the nationwide development of initiatives, refer to Part 2, Chapter 2, 3 (1).

We will promote the development of renewable energy facilities that can supply energy to public facilities in the event of a disaster or power outage, which is expected to become more severe in the future, and further promote the utilization of the Local Action Plan Supporting System (LAPSS) while upgrading it, to support local governments to effectively promote decarbonization of their administrative and business activities.

In addition, public-private training programs for local government officials and others will be further enhanced to deepen their understanding of the benefits and methods of decarbonization, such as the introduction of renewable energy. In particular, we will consider the roles and functions expected of existing organizations such as Regional Environment Offices, prefectures, and Center for Climate Change Action, while taking into account the operation of the system for dispatching advisors to build decarbonized communities, which was launched in FY2023, and the needs of local governments and other regions for decarbonization support, and consider the establishment of an intermediary support system that can provide seamless support to multiple local

governments from making plans for decarbonized development of regional community to the implementation of such plans.

With regard to building decarbonization projects that contribute to the region, we will support the development of regional decarbonization plans, including feasibility studies, expansion and reinforcement of collaboration between REPOS and EADAS, also utilizing the latest digital technologies such as satellite data, and develop and enhance information tools such as municipal records and analysis of regional economic circulation, to provide support from the information and technical aspects.

As an institutional response to support sustainable regional development through decarbonization, local governments will step up their efforts under the Local Government Action Plans based on the Act on Promotion of Global Warming Countermeasures. At the same time, while also utilizing the Regional Decarbonization Promotion Project and supporting the creation of regional visions as needed, we will promote zoning for renewable energy promotion in a wide area, to promote renewable energy in harmony with local communities, including support for decarbonization of regional companies.

(2) Promotion of national land management with the participation of diverse entities

(i) Initiatives based on the concept of national land management and succession by diverse entities

Based on the National Spatial Strategy and other plans based on laws related to national land planning, we will promote measures that not only reduce environmental loads but also conserve biodiversity in order to achieve sustainable national land management in harmony with nature. For example, we will promote private-sector activities to conserve and restore biodiversity, create an expansive ecological network that organically links forests, farmlands, urban green areas and waterfronts, rivers, and the sea, etc., develop and conserve forests appropriately, realize intensive urban structures, create environmentally sustainable transportation systems, build domestic wastewater treatment facilities and waste treatment facilities and other infrastructure for environmental preservation, and be engaged in measures to adapt to global warming.

In particular, in farming and fishing villages where there are concerns about the shortage of those engaged in land management, we will promote measures against damage caused by wildlife, and ensure appropriate maintenance and conservation of farmlands, forests,

and fishing grounds in order to establish sustainable agriculture, forestry, and fisheries. At the same time, we will promote measures such as innovation from farming and fishing villages that creates added value through the expansion of the scale of management, development of efficient production, processing, and distribution systems, the utilization of diverse local resources, development of necessary environment including as human resources development, and efforts regarding environmentally sound agriculture. We will encourage various entities such as the owners of forests and farmlands, NPOs, businesses, and communities to participate in land management that not only reduces environmental loads but also conserves biodiversity.

A. Promotion of forest maintenance by various entities

While clarifying the roles of the national government, local governments, and forest owners, we will ensure appropriate forest management by establishing a forest planning system that is easy to use and effective in the field, where local communities can play a leading role. For forests located in areas with poor natural and social conditions that are unsuitable for forestry, public entities should promote forest development. Furthermore, in order to promote forestation activities by various entities, cooperation and enhancement through networking among companies, NPOs, forest owners, etc., should be promoted.

B. Promotion of environmentally sound agriculture

As environmentally sound agriculture, we will promote sustainable agriculture that takes advantage of the natural circulation function of agriculture and gives consideration to reducing the environmental loads caused by the use of chemical fertilizers and pesticides through soil development, while also paying attention to compatibility with productivity. Specifically, in order to realize the MIDORI Strategy, the strategy for sustainable food systems, we will present the agricultural activities that are highly effective in preventing global warming and conserving biodiversity, as well as promoting efforts that contribute to reducing the use of chemically synthesized fertilizers and pesticides.

(ii) Raising awareness and promoting participation in order to instill the philosophies of national land management

In order to build a society in which all citizens voluntarily think about and practice national land management, we will promote education, including environmental education, based on the philosophy of ESD, and enhance opportunities for education and

practice for the creation of a sustainable society among citizens, businesses, NPOs, and private organizations.

In order to promote participation in national land management by diverse entities such as regional residents (including baby boomer generation and young people), NPOs, and companies, the concept of "national land management by citizens" will be disseminated through the nationwide development of the municipal management concept and regional management concept, and an environment will be created for information sharing among diverse entities and for the development of intermediary organizations supporting the activities of each entity, in addition to providing opportunities to experience regional activities.

A. Promotion of participation in forest management

We will promote "forest management participated in by citizens" involving various entities through the provision of fields and technologies for forest management activities and the creation of a "forest service industry" that uses the forest space to provide experience programs in various fields such as health, tourism, and education, as well as promote the "tree use and care movement," which leads to the utilization of regional forest resources and the appropriate maintenance and conservation of forests.

B. Raise awareness in parks and green spaces

We will develop efforts to promote and educate the public about conservation and greening in parks and green spaces.

(3) Utilization of local resources for sustainable regional development and the promotion of inter-regional exchange

(i) Utilization of local resources and development and maintenance of social capital with fewer environmental loads

We will promote efforts in which local governments, businesses and local residents collaborate and work together to accurately understand the region's characteristics, and based on such understanding, conserve and utilize the resources that exist in the region in a sustainable manner. Through these efforts, we will also accelerate regional green innovation and promote the creation of new industries, urban regeneration, and regional revitalization through environmental conservation and management.

A. Preservation and utilization of local resources and the promotion of inter-regional exchanges

With regard to secure energy supply, which is the basis of social activities, people have been aware of decentralized and self-reliant energy systems as effective means since the Great East Japan Earthquake. Based on this fact, we will promote the use of renewable energy existing in communities, and circulate resources, through the implementation of model projects. In introducing these renewable energies, the use of regional symbiosis-based resources and energies will be promoted through scientific data collection and surveys, since it is necessary to avoid or reduce the impact on natural capital such as landscapes, ecosystems, and hot springs, as well as to ensure smooth consensus building in the region.

Regarding the stock of social infrastructure, including urban infrastructures, transportation networks, and housing, we will promote the formulation of quality stock with high environmental performance, as well as appropriate maintenance and renewal so that the stock can be utilized over the long term. With regard to the conservation of green spaces and the promotion of greening, we will continue to support the efforts of regional entities based on the Master Plan for Parks and Open Spaces and other plans established by administrative agencies.

In addition, we will promote community-led efforts to supply renewable energy while ensuring appropriate land and resource use so as not to impair the food supply and land conservation functions of farming, forestry, and fishing villages. We will also support sustainable forest management, various uses of forest resources including woody biomass, and efforts by farmers and local residents to conserve and manage agricultural land and water and other resources in cooperation with the local community.

We will also promote initiatives to increase opportunities to have contact with, preserve, and utilize regional culture and nature, such as innovation from farming, forestry, and fishing villages and eco-tourism, which create added value through the participation of diverse entities, including local businesses as well as those engaged in agriculture, forestry, and fisheries industries, by utilizing not only agricultural, forestry, and fishery products but also various other regional resources such as local culture and history, forests, and landscape. In addition, we will also promote inter-regional exchanges and the creation of wide-area networks between urban areas and rural areas.

B. Infrastructure development to promote the conservation and utilization of local resources

In order to promote these measures, we will also work on infrastructure development, including information provision, institutional development, and human resource development. Regarding the provision of information, we will provide technical information, advanced case studies, regional information, and other information that meets the needs of various recipients, as well as develop and provide technologies for analyzing and utilizing such information.

In terms of institutional development, the foundation for promoting the formulation of regional plans will be established to clarify the roles expected of each entity in the region, promote stronger coordination among entities, and resolve institutional issues that arise as a result of efforts to create sustainable regions. In addition, in order to promote investments and loans for environmental projects in the region, we will seek to expand private investment through the provision of funds by the Japan Green Investment Corporation for Carbon Neutrality, and will continue to promote financing and investment through the use of green bonds and other means.

With regard to human resource development, the project aims to raise community awareness of environmental issues on the creation of a sustainable society through education based on the philosophy of ESD at schools and in society. In addition, while strengthening the organizational foundations of NPOs, we will promote the appointment of experts in the region to the policy-making process for community development, promote the participation of NPOs, and strengthen cooperation with universities and other research institutions in the region to secure capable leaders.

C. Utilization of forest resources and human resource development

We will promote community development with fewer environmental loads through the conversion of medium- and large-scale buildings to wooden structures, the utilization of local timber for housing and public buildings, and the utilization of wood biomass resources. We will also foster certified foresters who will lead the local forestry and forestry industry, forest business planners who will help build consensus for the consolidation of operations, and on-site skilled laborers who can properly conduct logging, reforestation, and road network construction.

D. Promoting the development of disaster-resistant forests

We will contribute to the conservation of the living environment and the maintenance of social capital by utilizing the natural environment of the region through the promotion of the development of disaster-resistant forests, including restoration and preventive measures for devastated mountain areas damaged by heavy rains and earthquakes, and protection against tsunami and wind damage by strengthening the development of coastal disaster prevention forests, etc.

E. Landscape preservation

We will promote the conservation of favorable landscapes in harmony with the natural environment, and the formation of unique landscapes, according to the characteristics of each area by coordinating and utilizing various systems such as regulatory guidance measures related to landscapes, and by taking advantage of various opportunities to improve facilities.

F. Conservation and utilization of the historic environment

We will utilize various systems such as old capital preservation, designation of historic site, place of scenic beauty, or natural monument, selection of an important cultural landscape, designation of scenic districts, and historic scenery maintenance and improvement district plans to conserve and utilize the historic environment that is integral with historic towns and the natural environment.

(4) Promotion of environmental education, ESD and collaborative efforts

A. Promotion of environmental education and ESD through all occasions and opportunities for all age groups

As for the development of leaders to create a sustainable society, it is important to promote with an aim to support and encourage all adults and children in conjunction with individual transformation and social and organizational change in all occasions. For this purpose, in addition to the Act on the Promotion of Environmental Conservation Activities through Environmental Education and the Basic Policy established by the national government in accordance with the Act, the following efforts should be promoted based on the Implementation Plan for Education for Sustainable Development (ESD) in Japan (Second Phase of the Domestic Implementation Plan for ESD) (decided in May 2021).

(1) In schools, based on the National Curriculum Standard, initiatives such as environmental education for the development of qualities and abilities necessary to become a leader in the creation of a sustainable society are promoted. Also, from the perspective of the whole-school approach, exchanges are promoted utilizing the network of UNESCO Associated Schools, which are ESD promotion bases, and school facilities should be improved in consideration of the environment (eco-schools) so that they can be used as materials for environmental education. Furthermore, in order to enable the entire school to implement cross-curricular activities in accordance with the children's developmental stages, relevant ministries and agencies will work together to provide training and teaching materials to teachers.

(2) In the home, community, and workplace, it is necessary to expand opportunities for participation in nature experience activities and other diverse hands-on activities in cooperation with relevant ministries and agencies, so that people can learn about the environment seamlessly from infancy to elderly, according to their motivation.

(3) In promoting environmental education, learning experiences are enhanced through the use of ICT and dialogue and collaboration among diverse entities, in addition to learning through experiential activities. Furthermore, in addition to improving high-quality environmental learning bases and promoting environmental education in a wide range of occasions through the "places to provide opportunities for hands-on experiences," we will promote voluntary efforts through an awarding system and the provision of training opportunities, as well as actively disseminate best practices through websites.

In order to promote the above efforts, intermediary supporting functions such as ESD activity support centers will be enhanced and their utilization will be promoted.

B. Promotion of collaborative efforts through dialogue toward the creation of a sustainable community

Through effective collaborative efforts on the premise of partnerships participated in by diverse entities, regional communities can enhance their ability to respond to and solve problems by learning from each other. In other words, the enhancement and strengthening of partnerships contribute to the development of human resources and communities, and collaborative efforts through dialogue among residents, private organizations, businesses, and the government are important for the creation of a sustainable community.

To this end, the Global Environment Outreach Centre and the Environment Partnership Office will serve as bases for introducing advanced case examples and holding meetings for exchanging opinions to promote cooperation among various entities, as well as for strengthening the policy-making functions of private organizations, and for supporting their efforts to develop self-reliant communities, thereby promoting environmental education and collaborative efforts that transcend generations, positions, and fields. In addition, by encouraging various organizations and groups that can fulfill intermediary supporting functions to share the abundant knowledge and experience related to intermediary supporting functions accumulated by these organizations, we will promote the development of regions and human resources through collaborative efforts that match the characteristics of the region.

5. Improvement and provision of environmental information and the enhancement of publicity

(1) Improvement of environmental information to promote EBPM

Refer to the Part 2, Chapter 3, 5 (4) (i).

(2) Information provision in response to user needs

Refer to the Part 2, Chapter 3, 5 (4) (ii).

(3) Implementation of policy making based on the best available scientific knowledge

Refer to the Part 2, Chapter 3, 5 (4) (iii).

6. Environmental impact assessment

Refer to the Part 2, Chapter 3, 5 (1).

7. Environmental health measures

(1) Health management and response to health concerns of residents regarding radiation exposure through risk communication

Refer to the Part 2, Chapter 3, 6 (1) (vi).

(2) Relief and prevention of health damage

(i) Relief for those affected

A. Pollution health damage compensation

Refer to the Part 2, Chapter 3, 4 (3) (i).

B. Promotion of measures on Minamata disease

Refer to the Part 2, Chapter 3, 4 (3) (iv).

C. Relief for asbestos health damage

Refer to the Part 2, Chapter 3, 4 (3) (v).

(ii) Prevention of damages

In order to prevent health hazards caused by air pollution, the Environmental Health Surveillance Survey will be conducted. Pollution-related health damage prevention projects such as research and study will be conducted through the fund established in the Environmental Restoration and Conservation Agency (ERCA).

In order to prevent and reduce health effects via the environment, we will provide information on prevention methods and conduct public education on pollen disease, heat illness, yellow sand, electromagnetic fields, and ultraviolet rays.

With regard to heat illness countermeasures, we will promote and strengthen heat illness prevention actions by local governments, businesses, and citizens through the preparation and dissemination of various guidelines and awareness materials on heat illness countermeasures, such as the "Heat illness Environmental Health Manual," and the dissemination of various information through heat illness prevention information websites.

Regarding pollen disease, the government will work in unison to promote pollen disease countermeasures based on the "Overall Picture of Pollen Disease Countermeasures" decided at the May 2023 Ministerial Conference on pollen disease.

8. Pollution dispute resolution and environmental crime prevention

(1) Pollution dispute resolution

(i) Pollution dispute resolution

In light of the diversification and increase in the number of pollution disputes in recent years, we will appropriately conduct mediation, conciliation, arbitration, and ruling based

on the Act on the Settlement of Environmental Pollution Disputes (Act No. 108 of 1970) in order to further accelerate the appropriate resolution of pollution-related disputes.

(ii) Pollution complaints settlement

In order to preserve the living environment of residents and to prevent future pollution disputes, we will provide guidance and information for the appropriate handling of pollution complaints so that the settlement of pollution complaints by local governments is properly operated in accordance with the Act on the Settlement of Environmental Pollution Disputes.

(2) Environmental crime prevention

In addition to developing a system to further improve the effectiveness of enforcement against environmental crimes, such as illegal dumping of industrial waste, we will review laws and regulations in response to changes in social conditions, and promote measures to deter environmental crimes in advance.

Part 4 Effective implementation of the Basic Environment Plan

1. Review of the progress of the Plan

(1) Implementation policy

The Central Environment Council will review the progress of the measures based on the Basic Environment Plan, while listening to the opinions of citizens of various categories to ensure the steady implementation of the Basic Environment Plan. The Council will report to the government on subsequent policy directions as needed.

(i) Progress review of individual measures stipulated in the Plan

The Central Environment Council will review in FY2025 and FY2027 the progress of individual measures through interviews with related ministries on Part 2 Chapter 2 “Development of environmental policy for each priority strategy” and Chapter 3 "Development of priority measures in individual fields", and Part 3 “System of environmental protection measures.” As for “1. Climate change measures" under the "Development of priority measures in individual fields" of Part 2 Chapter 3 and "1. Conservation of global environment" under Part 3 "System of environmental protection measures," the latest review results of the Plan for Global Warming Countermeasures and the Climate change Adaptation Plan will be utilized as much as possible. As for "2. Establishment of a sound material-cycle society" under the "Development of priority measures in individual fields" of Part 2 Chapter 3 and "3. Establishment of a sound material-cycle society" under Part 3 "System of environmental protection measures," the latest review results of the Fundamental Plan for Establishing a Sound Material-Cycle Society will be utilized as much as possible. As for "3. Securing biodiversity and living in harmony with nature" under the "Development of priority measures in individual fields" of Part 2 Chapter 3 and "2. Efforts for the conservation of biodiversity and sustainable use" under Part 3 "System of environmental conservation measures," the latest review results of the National Biodiversity Strategy and Action Plan of Japan will be utilized as much as possible.

(ii) Review of comprehensive progress of the Plan

The Council will review the priority strategies in FY2026 and FY2028 by referring to the review results of individual measures implemented in the previous year respectively. The review will emphasize how much progress has been made on “the reduction of total environmental load,” "the maintenance, restoration, and enhancement of natural capital,"

"realizing higher environmental values added," “the realization of well-being/quality of life,” and "integrated improvements on environment, economy and society (II2ES)," as mentioned in Part 1 Chapter 2, in each priority strategy. In addition, interviews will be conducted on good practices by public and private initiatives related to priority strategies. We will also review progress made on each of the measures as a part of the system of focused measures in individual fields and environmental conservation measures. Based on these results, a report will be compiled respectively on the comprehensive progress of the Basic Environment Plan.

(iii) Utilization of indicators for understanding the progress

The review will use a set of indicators that collectively show the environmental situation and the progress made on various initiatives concerned. This will clarify the overall trends regarding progress of the Plan and contribute to ensuring the effectiveness of the Plan. At the same time, the ideal evaluation regarding the comprehensive progress of the plan as mentioned in (ii) above will be discussed. Quantitative indicators will be used as much as possible. However, in a case where it is difficult or inappropriate to quantify the indicators due to the nature of the measures concerned, qualitative evaluation is used as a basis and quantitative indicators will be applied supplementarily. The characteristics and limitations of these indicators should be taken into account. It is also important to strive to gain broad understanding of stakeholders. Reviews will be routinely carried out so that the indicators accurately reflect the direction of the Plan and appropriately match the state of the environment, economy and society. Indicators should be revised flexibly as necessary, considering their continuity and further improvement.

(2) Utilization of review results of progress of the Plan

The review results by the Council will be utilized for planning national policies, and reflected in the annual report as stipulated in Article 12 of the Basic Act on the Environment, thereby communicated widely to a wide range of stakeholders.

2. Implementation of the Plan

(1) Implementation of the Plan by government

For the effective implementation of the Basic Environment Plan, it is necessary to first confirm the status of environmental conservation, which consists of the objectives of environmental policy, namely to "prevent hindrances to environmental conservation" and the "creation of a good environment," and to "realize the 'well-being/quality of life' of

individual citizens now and in the future" and to "contribute to the welfare of humankind" through it. To be specific, we will set renewable resources, such as recycled resources and biomass resources as a basis for reducing the total amount of environmental load and preventing further damage to natural capital, and realize the "well-being/quality of life" by enhancing natural capital to create a good environment and use it in a sustainable manner. It is very important that all entities, both within and outside the government, share the policy of aiming to realize a circulation and symbiosis based society through integrated improvements on environment, economy and society (II2ES), centering on the environment, and that all entities cooperate and take actual actions toward the realization of this policy.

In addition to the Cabinet meeting, the government will deepen common understanding of the policy mentioned above through related ministerial meetings and meetings between relevant ministries and agencies, and work closely with relevant organizations to implement measures on environmental conservation raised in the Basic Environment Plan in a comprehensive and systematic manner. The government will also work to obtain a shared recognition regarding the policy mentioned above among all stakeholders including local governments, businesses, private organizations and citizens.

In order to implement various measures listed in the Basic Environment Plan, we will put in place the necessary systems, financial arrangements and others, while verifying how effective the measures will be. Based on the progress of the Plan and the state of the environment, the government will work appropriately by adding necessary improvements, and promoting comprehensive implementation of various projects under the cooperation of relevant organizations. The government will also work to take financial and other necessary measures to cover the costs for environmental conservation actions taken by local governments voluntarily and proactively according to local situations.

Based on the Basic Environment Plan, the relevant ministries and agencies will promote environmental considerations, according to basic policies regarding environmental considerations both for actions by ordinary economic entities such as use of goods and energy in offices, conferences and events, and for policy development such as drafting new institutions which could significantly impact the environment. To enhance initiatives of environmental considerations, we will proactively promote efforts to improve environmental management systems through reviewing the implementation of measures for environmental considerations, and strengthening mechanisms to reflect the results of

such reviews in each relevant activity.

(2) Implementation of Plans by non-government entities

It is necessary for all entities to cooperate and collaborate closely to voluntarily and actively promote various measures under a fair division of roles based on the Basic Environment Plan. Each entity is to make maximum efforts to incorporate environmental considerations into its own actions in line with the policy of the Basic Environment Plan mentioned above. The procedural methods such as the environmental management system will be utilized to promote this challenge.

Along with the policy mentioned in the Plan, local governments are expected to proceed comprehensively and systematically with measures in line with the national government as well as with their own measures, by formulating a comprehensive environmental conservation plan in cooperation with the national government and in response to local natural and social conditions.

(3) Collaboration with various plans

Socio-economic activities are more closely linked with the environmental issues. As a result, policies in a wide range of areas are related to environmental policy. In formulating plans that are considered to have an impact on the environment, the national government must consider environmental conservation in line with the policy mentioned in (1) above. Regarding consideration for environmental conservation, the following measures will be taken.

In terms of environmental conservation, it is important that there is a harmonization maintained between the Basic Environment Plan and other national plans.

Other national plans, exclusively aimed at conserving the environment should be formulated and promoted in accordance with the fundamental policy of the Basic Environment Plan.

For those plans that include components concerning environmental conservation, the part prescribing environmental matters shall be in line with the fundamental policy of the Basic Environment Plan. Therefore, both these plans and the Basic Environment Plan should be coordinated and mutually supportive. Particularly, for those plans for which specific laws and regulations require harmonization with the Basic Environment Plan,

special care needs to be taken to ensure that they are in line with the fundamental direction of the Plan.

3. Revision of the Basic Environment Plan

The government will revise the contents of the Plan approximately five years following its formulation. Based on the above-mentioned review results by the Council, necessary consultations will be made with the Council. Considering the revision of the contents of the Plan, the Plan will be re-formulated when considered necessary. In terms of the concrete goals of each area and specific measures contained in the Plan, it is important to respond flexibly and appropriately, with a view to realizing the sustainable society envisaged, according to changes in the economy and society both in and outside Japan as well as considering and updating of progress of measures taken.