

Recommendation

**Coordinating efforts by industry, government, academia,
and citizens to combat the climate crisis**

**Transformation to a carbon-neutral society in harmony
with nature restoration through the establishment of a
circular economy -**



27 October 2025

Science Council of Japan

This Recommendation is largely the outcome of the deliberations of the Committee for Transition to Carbon-Neutral Society Harmonized with Nature Restoration by Employing Circular Economy, Science Council of Japan, and is issued under the auspices of the Science Council of Japan.

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Restoration by Employing Circular Economy**

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This English version is a translation of the original written in Japanese.

EXECUTIVE SUMMARY

I Background

“The Paris Agreement”, as a key international framework for tackling climate change, sets the goal of keeping the rise of global average temperature sufficiently below 2°C above the pre-industrial level, and if possible below 1.5°C. It also sets a global long-term goal of achieving "carbon neutrality (hereinafter abbreviated as CN as needed)" in the second half of this century by balancing anthropogenic emissions and absorption of greenhouse gases. The Japanese government declared its aim to achieve carbon neutrality by 2050 in 2020, then, in February 2025, submitted a new numerical target to the United Nations to reduce the emissions by 73% from fiscal 2040.

Achieving carbon neutrality will require societal transformations at an unprecedented scale. While aiming at realization of a carbon-neutral society to address climate change must be in harmony with two other pillars of environmental policy: a circular economy (hereinafter abbreviated as CE as needed) and a nature-positive society (hereinafter abbreviated as NP as needed). It is an urgent task for a coalition of academia, governments, and civil society to outline a path toward a sustainable environment, society, and economy that also contributes to economic security and strengthens industrial competitiveness.

II Current Status and Issues

The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) states that “it is unequivocal that human influence has warmed the atmosphere, ocean and land.” In 2024, the global average temperature reached record high, and it was also the hottest year in Japan's history. Meanwhile, geopolitical instability continues, and rising energy and commodity prices are putting pressure on people's livelihoods. In this context of increasing international uncertainty, it is an even more important priority for Japan to address various environmental issues, including the climate crisis. While it is certainly important for governments, businesses, and citizens to share a sense of crisis about global environmental change, along with the need and urgency to respond to such change, we must realize that fostering a sense of crisis alone will not be enough to improve such situations. Additionally, we should provide remedies for accelerating to take the countermeasures against global environmental issues in order that people can realize that it is essential to confront the reality and to address such issues for improving their lives without passing such issues on to future generations.

III Recommendations

(1) Share a sense of crisis both domestically and internationally to accelerate the counter measures to combat climate change, which is progressing faster than expected

In 2024, the global average temperature reached 1.5°C above pre-industrial levels, and the impacts of climate change have become manifested in frequent wind and flood damage, record-breaking heatwaves, and food shortages. In a complex situation where diverse and conflicting information is readily available, it is essential to provide the public with highly reliable information, for which the academic community plays a major role.

The Government must clearly communicate the importance of climate change countermeasures both domestically and internationally, without being swayed by policy changes in other countries, to convey the significance and necessity of reducing climate change-related damages and to share a sense of crisis among diverse actors, including the public, as if it were their own problem.

(2) A social implementation pathway with clear checkpoints and implementing entities for achieving the 2050 target

In order to achieve carbon neutrality, it is required to clearly recognize checkpoints, such as the mid-term reduction target and to proceed with plan the social implementation of the countermeasure by clarifying implementing entities, as part of the plan towards the CN target.

The national government must set the necessary investment levels, secure financial resources, and lead the development of social infrastructure needed for a just and wise transition to a carbon-neutral society. It must also help clarify environmental and social responsibility in corporate activities and lead smooth transformation of the industrial structure. Businesses and other implementing entities must establish specific milestones and work closely with the national government to advance structural reforms in their businesses. It is required for citizens to choose actions in their daily lives and consumption activities necessary to build a sustainable society. Academia must lead the way in social implementation based on scientific evidence.

(3) Support measures for social implementation that are rooted in local communities, and leveraging the industry-government-academia collaboration

Given the short time until the target year for achieving carbon neutrality, it is necessary to leverage industry-government-academia collaboration, as a strength of Japan, to rapidly and appropriately implement countermeasure technologies tailored to local conditions. Taking into account social factors such as the acceptability of new technologies and the just transition of local industries, it is necessary to create a forum and to foster coordinators to facilitate collaboration among diverse stakeholders. The academic community should

become more actively involved in regional activities than ever before, such as taking the lead in facilitating regional transformation and fostering leaders,

(4) The role of academia in social implementation of policies and measures

Academia must reaffirm its role in developing research in accordance with societal needs. Countermeasures to address global environmental issues and the development and implementation of new technologies should continue beyond 2050. To meet long-term expectations for technological innovation, we must also clarify the path from fundamental research to societal implementation, in addition to continuing various lines of basic research and creating new research disciplines. Furthermore, it is also important to build social systems and foster a common understanding of the relationship between society and technology, and we must become clearly aware that technological development, linked solely to industrial growth, will not be enough to build a society that utilizes science and technology. In the important roles that academia must fulfill, the following are included: leveraging advances in information technology for social transformation, linking knowledge across disciplines, connecting academia and society, and nurturing the talent to carry out these tasks.

(5) Strategies to achieve carbon neutrality, circular economy, and nature positive simultaneously, from clarification of potential synergies and trade-offs

There are many environmental issues to be addressed simultaneously, including biodiversity conservation, for which international treaties have been negotiated and signed alongside those on climate change. The concept of the circular economy, developed in Europe, as well as the 3R+renewable initiative developed in Japan, are not only important initiatives for addressing societal issues such as climate change, biodiversity, and environmental pollution, but also have the potential to strengthen industrial competitiveness, economic security, and regional revitalization. It is required for the academic community to present strategies to achieve these goals by identifying trade-offs and synergies among countermeasure to address climate change and other environmental issues and promoting comprehensive overview of common interests. In doing so, it is essential to compile success stories and share the keys for simultaneously achieving the three pillars of today's environmental policy: carbon neutrality (CN), circular economy (CE), and nature-positive (NP), grounded in the fundamental principles and ideals of environmental policy.

(6) Decide and implement solutions to complex issues with multiple actors based on a comprehensive analysis of the complex issues

In addition to the three key environmental issues of carbon neutrality, circular economy, and nature-positiveness, mountains of other issues directly affect people's lives. After understanding these issues comprehensively, we must build a governance system that allows not only the Government but society as a whole to collaborate with a clear division of

roles. In order to surely promote the policies that will have a significant impact on society, in addition to formulating goals and overall plans with the participation of relevant actors, but relevant actors must clarify the measures and implementation challenges, and we should establish an institutional framework that enables us to sort out the measures and problems upon their implementation with relevant actors, to develop concrete action plans with timelines and goals for resolving the issues, to assess the plans themselves, and to advance the steady implementation of policies within the PDCA cycle.

(7) Integrating efforts to achieve sustainability at both the global and local levels

It is also a shared global goal to simultaneously resolve multiple and complex issues. While in the current international framework, each country is given its target to reduce emissions, what's needed are meaningful contributions to emission reductions. While it is impossible to halt climate change through Japan's national emissions reductions alone, Japan can play a key role as a global citizen by internationally sharing the principles of a carbon-neutral transition, the social systems that support it, and the knowledge and technologies that underpin them. Additionally, by learning from each other's experiences, we can make a significant impact on global carbon neutrality.

At the same time, Japan faces many pressing challenges, including a declining birthrate, an aging population, rural depopulation, and high risks of major disasters. It is therefore necessary to incorporate perspectives for climate change countermeasures against climate changes into key policies for regional revitalization and disaster resilience.

It is essential to integrate all domestic and international efforts to address climate change and to enhance sustainability at both the global and local levels.