



Summary of Keynote Speech

Hans J. SCHELLNHUBER, Emeritus Director at Potsdam Institute for Climate Impact Research (PIK), began his keynote by expressing his gratitude and honour to be returning to Japan after accepting the Blue Planet Prize in 2017. He stated that the year 2022 marks the 50th anniversary of the publication of *The Limits to Growth* by the Club of Rome, which predicted that growth would reach a breaking point as finite resources of the planet are depleted and environmental pollution progresses beyond the natural limits.

He mentioned that, for many populations living in environments vulnerable to climate change, in addition to the decrease in food production due to the conflict in Ukraine, resource depletion is an especially alarming issue. He delivered his speech on the “planetary boundaries” concept, some new EU initiatives, and some expectations for Japan in this regard. The main points are as follows:

- The first assessment (2009) on planetary boundaries demonstrated that three of the nine planetary boundaries (climate, biodiversity, and the nitrogen cycle) have been breached. The latest assessment (2022; unpublished) shows that six limits had been breached, with the integrity of the biosphere at exceptionally high risk.
- Despite the Paris Agreement adopted at COP 21, where Parties agreed to limit global warming to below 2°C, and the Glasgow Agreement at COP 26 that elevated this ambition to limiting warming to 1.5°C, climate action has so far been insufficient: even a 1.5°C average temperature increase could cause massive and irreversible climatic changes at multiple locations around the globe.
- In his article¹, the critical functional relationship between boreal summer insolation and global CO₂ concentration was proposed, which explained the beginning of the past eight glacial cycles and anticipated future periods of glacial inception. It suggested that the glacial inception expected to occur before the beginning of the Industrial Revolution did not happen, and that cumulative anthropogenic CO₂ emissions would postpone the next glacial inception by at least 100,000 years.
- His recent paper² pointed out that anthropogenic climate change could threaten civilization’s extinction. He has thus been calling on the IPCC to produce a special report on this and would appreciate support from both Japan and Germany for its publication.
- According to the latest science, unless there is a fundamental change in climate change policies, a temperature rise of well above 2°C is expected; thus, it is essential to reduce CO₂ emissions and strengthen nature as a carbon sink.
- The EU, with its “European Green Deal”, aims to reduce CO₂ emissions by 55% by 2030

¹ Ganopolski, A, R Winkelmann, and H J Schellnhuber. 2016. “Critical Insolation-CO₂ Relation for Diagnosing Past and Future Glacial Inception.” *Nature* 529 (7585): 200–203. <https://doi.org/10.1038/nature16494>.

² Kemp, Luke, Chi Xu, Joanna Depledge, Kristie L. Ebi, Goodwin Gibbins, Timothy A. Kohler, Johan Rockström, et al. 2022. “Climate Endgame: Exploring Catastrophic Climate Change Scenarios.” *Proceedings of the National Academy of Sciences* 119 (34). <https://doi.org/10.1073/pnas.2108146119>.

and become the world's first carbon-neutral continent. Decoupling economic growth and emissions from fossil fuels is well within reach, as demonstrated by the German example, where gross domestic product increased by 48% between 1990 and 2020, while emissions decreased by 41%. Average temperatures have already risen by 1.2°C, and, under the business-as-usual scenario, are projected to increase by 4°C from pre-industrial levels, far exceeding 2°C. Limiting global warming to 1.5°C is already a tough target, but warming must eventually be reversed to safer levels through the removal of carbon from the atmosphere.

- Nature-based solutions (NbS) are effective in the reduction of CO₂ emissions. Reforestation of the one billion hectares of degraded area worldwide is one possible measure. Others may involve using wooden materials produced under sustainable forest management in urban buildings.
- This idea was introduced in the article, “Buildings as a global carbon sink”³, published on the occasion of the G7 Urban Development Ministers meeting under the German Presidency in 2022. The models estimated that, if the circular economy involving construction materials is accelerated by growing and using wood and recycled materials, this practice done over a century can contribute to massive reductions, including of past emissions. (It is estimated that 500 billion trees need to be planted and about 2 billion houses built with harvested biomass materials.)
- The newly launched EU initiative “New European Bauhaus”⁴ aims to address issues such as climate change by co-creating sustainable, beautiful, and innovative lifestyles and spaces. They have held meetings on using organic resources toward architecture for a new era.
- Historical wooden buildings such as the Horyuji Temple and recent innovative architecture designed by the Japanese architect BAN Shigeru are good examples that show the high potential of reforestation of the city and buildings in line with NbS in Japan, a country where 70% of land is forest.
- Albert Einstein's summer villa in the village of Caputh, south of Berlin, is famous for its wooden architecture, designed by Konrad Ludwig Wachsmann. As Einstein famously said, "The world will not be destroyed by those who do evil, but by those who watch them without doing anything". We must face the facts and take action whenever possible.

³ Churkina, Galina, Alan Organschi, Christopher P. O. Reyer, Andrew Ruff, Kira Vinke, Zhu Liu, Barbara K. Reck, T. E. Graedel, and Hans Joachim Schellnhuber. 2020. “Buildings as a Global Carbon Sink.” *Nature Sustainability* 3 (4): 269–76. <https://doi.org/10.1038/s41893-019-0462-4>.

⁴ The New European Bauhaus is a creative and interdisciplinary initiative to enhance European Green Deal to the living environment. It was named after Bauhaus (German for 'building house'), an art school operational in Weimar, in early 20th century that provided comprehensive education in art and architecture, crafts and photography and became famous for its approach to design.

Summary of and Comments from the Thematic Sessions

Session 1 Decarbonisation and Energy Security

Session Chair:

- TAKAMURA Yukari
Professor, Institute for Future Initiatives, the University of Tokyo

Special Lecture:

- KOIKE Yuriko
Governor, Tokyo Metropolitan Government/Formal Minister of the Environment, Japan

Video Message:

- Alok SHARMA
President, the 26th United Nations Climate Change Conference (COP26)/Former Secretary of State for Business, Energy and Industrial Strategy, UK

Speakers:

- MIYASHITA Yutaka
Managing Corporate Executive, Mitsubishi UFJ Financial Group
- SEKIYAMA Takashi
Associate Professor, Graduate School of Advanced Integrated Studies in Human Survivability (GSAIS), Kyoto University
- Ulrik STRIDBÆK
Vice President, Group Regulatory Affairs, Ørsted

Current situation of climate change in Japan and the world

- Climate change is having serious impacts on the natural ecosystem, which is the basis for all human survival, as well as on people's livelihoods and the social economy, with climate change-induced meteorological disasters causing enormous economic losses. Climate hazards are a clear and present danger.
- The latest science, such as the Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report (AR6), concludes that it is unequivocal that human influence has warmed the planet. It is projected that the frequency and intensity of extreme weather events will increase as temperatures rise further. In light of future climate risks, it is imperative to limit temperature rise as much as possible.
- At COP26, the world resolved to pursue a 1.5°C target. Governments are encouraging companies to respond to climate risks. Financial institutions and investors are heading towards decarbonisation.

- With the dramatic fall in renewable energy costs, an unprecedented energy transition is underway, making it possible to achieve decarbonisation and energy security simultaneously. Policies that make this possible are critically important.

Climate security and the geopolitical implications of the energy transition

- The Ukraine crisis has demonstrated the risks of depending on foreign countries for energy.
- The energy transition may change the types of strategic resources required, thereby shifting the balance of geopolitical power in favour of countries that produce such resources. For instance, countries without cheap and stable supplies of renewable energy might be left behind in the global economy. Furthermore, competition for green hydrogen will impact countries' industrial and economic power.
- Energy saving and the introduction of renewable energy could be immediate countermeasures to cope with the energy crisis. In the short term, the use of fossil fuels may increase, but in the long term, renewable energy should be the way to pursue for both energy security and climate mitigation.
- Countermeasures against climate change have a significant influence on energy security. The remaining time is said to be 10 years. If we do not act in this decisive decade, it will be too late.

Current status of offshore wind power in the world and implications for Japan

- According to their experiences overseas, young employees of offshore wind power development companies and investors are increasingly interested in sustainability. The scale of offshore wind is so large it may have an impact on biodiversity, and thus it is important for developers to carry out not only project implementation, but also biodiversity conservation. Developers are working to address these issues along the entire supply chain, including the materials used, in line with the goal of becoming "nature positive".
- Dialogue with local residents and fishermen is an essential and unavoidable issue in offshore wind development projects. For Japan to achieve its targets of 10 GW by 2030 and 20-40 GW by 2040, it is necessary to increase the predictability and acceptability of project implementation and to achieve coexistence with fisheries by identifying the location, scale and timing of project introduction at an early stage. Increasing the scale of offshore wind power projects will save implementation costs.
- Offshore wind power can create 30-40 years of stable employment for the local community during the operational phase. It is important to provide not only more jobs but also opportunities to acquire essential skills at same time.
- Offshore wind power is a technology that can be applied to Japan, which is prone to typhoons and other natural disasters. However, Japan faces many technical challenges. Just as Japan has overcome challenges to develop the Shinkansen bullet train, there is hope that floating offshore wind power will develop significantly in Japan.

Role of financial institutions toward carbon neutrality

- Financial institutions are tackling decarbonisation through finance. In addition to efforts toward their own carbon neutrality, they are engaged with customers, including providing support for visualising GHG emissions and developing and implementing reduction plans and strategies.
- Along with support for green businesses, such as renewable energy-related businesses, transition finance to support companies' transition towards carbon neutrality is important. It is necessary to foster a common understanding of what constitutes an appropriate and just transition.
- Policy support for creating a business environment can enhance business predictability as businesses move forward with decarbonisation initiatives. For offshore wind, it is time to start discussing what can be done to increase business predictability.
- A framework to ensure transparency in the project decision-making process is needed to build consensus on how to consider climate change and biodiversity, in addition to costs, in project formation.
- Efforts by small and medium-sized enterprises (SMEs) in the supply chain and consumers who use the end products are also important. Companies are also required to reduce emissions, including Scope 3. In particular, SMEs need support for decarbonisation efforts, including the identification of GHG emissions, in order to continue their business.

Simultaneous resolution of climate change and other relevant issues through maximising synergies

- Dealing with climate change is a challenge that has synergies and trade-offs with the protection of water resources and biodiversity, and resource cycles. It will be crucial to act in ways that maximise synergies while taking steps to mitigate trade-offs. The challenges are many and complex, but it is necessary to confront them boldly so as to create breakthroughs. Policies, finance and technology that make this possible are of vital importance.

Session 2 Climate Change Adaptation and Water

Session Chair:

- OKI Taikan
Special Advisor to the President/Professor, Graduate School of Engineering,
The University of Tokyo

Speakers:

- NAKAKITA Eiichi
Director/Professor, Disaster Prevention Research Institute, Kyoto University
- MIMURA Nobuo
Specially Appointed Professor, Global and Local Environment Co-creation Institute,
Ibaraki University
- SAITO Norio
Director, Urban Development and Water Division, South Asia Department, Asian
Development Bank (ADB)
- Luzette KROON
Chairman, Water Authority Wetterskip Fryslân/ Boardmember, Association of Dutch
Water Authorities responsible for International Affairs and Innovation

Scientific findings and projections on climate change and increased disaster risk

- The IPCC 6th Assessment Report clearly states that human influence on global warming is unequivocal and human-induced climate change has caused widespread adverse impacts and related losses and damages to nature and people, beyond natural climate variability.
- Floods and landslides have become more frequent in recent years, but they are more severe than in the past because climate change is causing temperatures and sea levels to rise and precipitation to intensify.
- The latest scientific advancements, such as hourly output values from climate models, enable the prediction and estimation of climate change impacts on hazards, such as heavy rainfall, and water resources. In addition, the contribution of climate change impacts to increments of disaster intensification can be scientifically calculated through the “detection and attribution”⁵ method.
- In the Asia-Pacific region, water issues have various multifaceted impacts. They are not limited to disasters such as floods and droughts, but include worsening water access and food insecurity brought about by water scarcity, water pollution, and biodiversity loss due to wetlands destruction.
- There is concern that, by the end of this century, parts of South Asia and Africa will be at risk of heat waves and intense rainfall at magnitudes never experienced before by humankind.

⁵ A method to estimate whether and to what degree, natural and anthropogenic drivers have favoured the occurrence of a past event from a probabilistic point of view. Bellprat, Omar, Virginie Guemas, Francisco Doblas-Reyes, and Markus G. Donat. 2019. “Towards Reliable Extreme Weather and Climate Event Attribution.” *Nature Communications* 10 (1). <https://doi.org/10.1038/s41467-019-09729-2>.

The RCP8.5-SSP5 scenario projects that 1.7 billion people, or 23.3% of the global population, will be exposed to unprecedented climate risks. (Under the RCP2.6-SSP1 scenario, 401 million people, or 5.81% of the global population, are projected to be exposed.)

- We are not currently on a pathway to keep warming below 1.5°C/2°C, and society's choices and actions in the next decade will determine the future of the world.

Effective and efficient enhancement and promotion of weather disaster countermeasures that take climate change into consideration

- An integrated approach is needed when planning and implementing adaptation measures. Such approaches encompass integrating individual sectors and climate change measures, addressing present and future challenges, and implementing so-called 'co-benefit' approaches, which contribute to addressing other social issues.
- To move toward a sustainable society in the 21st century, we need to promote climate-resilient development (CRD) and change the relationship between climate, ecosystems and human society to one that is healthy and sustainable. To promote adaptation measures, it is essential to develop a future vision for regions, where well-being is improved and citizens can live with self-esteem and dignity, and, while considering aspects of climate mitigation, share this vision among diverse stakeholders. It also calls for institutional frameworks, social awareness, various systemic transformations and political leadership.
- Japan's flood control administration has undergone two paradigm shifts: updates to flood control targets based on scientific climate change predictions and further incorporation of basin flood control and basin-wide response into flood control planning. Basin flood control integrates disaster prevention, mitigation and regional planning. Going forward, innovative adaptation measures for basin flood control and the quantification of their effects will be required. It is essential to promote measures that are deeply integrated with other areas, encouraging co-benefits between mitigation and adaptation by promoting soil carbon sequestration through mountain and forest management, and promoting healthy water cycles. In the Netherlands, integrated approaches to flood management are emphasised to cope with diverse hazards such as heavy rainfall, extreme heat and drought. Water-related policies are considered to be a crucial factor in future spatial development.
- The Asian Development Bank provides assistance to river basins and coastal areas in India and Bangladesh to address water-related issues caused by climate change impacts. The Asian Development Bank makes comprehensive efforts to build resilient river basins and coastal areas based on projections of climate change risks, and the knowledge gained from these efforts is being actively applied to adaptation efforts in other countries and regions.
- Delaying measures because of uncertainty about the extent of future climate change impacts could make future adaptation more difficult or even impossible. Therefore, it is important to practice "no-regret" adaptation. In addition, due to the uncertainty of future projections, the concept of "adaptive adaptation," in which measures are flexibly adjusted in response to changes in projections and circumstances, is also necessary. Monitoring and forecasting are key to this process. This approach is necessary not only for adaptation measures but also for mitigation measures.

- Long-term and sustainable funding is necessary for the steady implementation of adaptation measures. To this end, the use of both public and private funds is essential. However, there are many challenges in utilizing private funds for adaptation measures, and further investigation is needed to address the question of how to provide incentives and other such issues. In order to further increase investment in adaptation, the understanding and empathy of citizens are necessary. Efforts to gain such understanding and sympathy must not be neglected.
- There are limits to risk management, and a crisis management mindset for dealing with risks that are not recognised in advance is also essential. Experts need to be as imaginative as possible and do their best to be prepared for unknown events.

International cooperation on weather disaster preparedness in the era of climate change

- Many areas will be exposed to risks exceeding what they have experienced in the past. For example, some regions, such as Mumbai and New Delhi in South Asia, are expected to transgress the climate risk boundary at the end of this century, exposing the people in those regions to unprecedented climate risks never before experienced by humankind. Therefore, in addition to adequate investment, countries need to take concerted actions, including the promotion of science, technology, and innovation, to mitigate new risks.
- Even in regions that do not transgress the global climate risk boundary, there are many sub-regions that transgress the climate risk boundary within each region. Moreover, even if a particular climate risk has been experienced in the past in a given region, historical circumstances and cultural, economic, and social factors may prevent technology transfer and inhibit adequate adaptation. With such considerations in mind, it is vital to have a smooth transfer of knowledge and technologies through global cooperation based on multilateralism.
- Sharing regional knowledge and experience through multilateral cooperation and mutual learning on technologies and institutions is also essential for realistic and effective climate change adaptation measures. For example, the Asian Development Bank's "Asia-Pacific Water Resilience Hub"⁶ is developing capacity and providing various tools and technologies to address water issues that are becoming more serious due to climate change.

⁶ <https://hub4r.adb.org/>

Session 3 Establishing Sustainable Societies: *Bringing Biodiversity and Food Security into View*

Session Chair:

- TAKEUCHI Kazuhiko
President, Institute for Global Environmental Strategies (IGES)
Project Professor, Institute for Future Initiatives, The University of Tokyo

Speakers:

- Elizabeth M. MREMA
Executive Secretary, the Convention on Biological Diversity (Online)
- ISHII Naoko
Executive Vice President/ Professor, Institute for Future Initiatives/ Director, Center for Global Commons, The University of Tokyo
- Monte CASSIM
President and Chair of the Board, Akita International University
- FUMA Kenji
CEO, Neural Inc.
- TAKENAKA Mitsugi
Mayor, Kamishihoro Town Hokkaido, Japan

The decisive decade for a sustainable future

- The decade up to 2030 is called the “Decisive Decade” to overcome global environmental challenges and pave the way for a sustainable future. It is the Decade of Action to achieve the 2030 Agenda and SDGs, increase ambition under the UNFCCC, and concurrently implement the UN Decade of Ecosystem Restoration, the 2030 “no net loss” biodiversity target under the draft post-2020 global biodiversity framework (GBF).
- Ambitious and comprehensive target-setting for the sustainable management of land and sea areas for food production is essential under the post-2020 GBF, to be adopted at part two of CBD COP 15 in December this year.
- The possible agenda items for the 2023 G7 Ministers’ Meeting on Climate, Energy and Environment in Sapporo, a ministerial meeting of the G7 Hiroshima Summit, might include synergies and trade-offs between biodiversity and climate, the assessment of dependence and impacts on biodiversity by the private sector, and management of related risks.

“Food system” as a nexus challenge

- The food system, a concept that looks across the production, processing, distribution and consumption of food, is key to linking human health and global environmental sustainability. Although the world needs to provide healthy food for approximately 10 billion people by 2050,

the number of undernourished people is currently increasing. Transforming the food system is a prerequisite to achieving sustainability by 2050.

- Biodiversity and ecosystem services are essential for food production and are therefore fundamental for food security and nutrition; however, food production is one of the major drivers of biodiversity loss, climate change and land degradation. With such complex interactions becoming apparent, the food system needs to be viewed as a nexus challenge and addressed in an integrated manner. As such, it was meaningful to have this discussion on biodiversity and food security at this time.
- Transboundary environmental impacts (spillovers) from high- and upper middle-income countries to many lower middle-income and low-income countries through global trade are significant. Keeping globalised food supply chains in mind, the relationship between food importing and exporting countries needs to be revisited.

Overcoming negative consequences of food systems

- Ten leverage points for transforming food and land use: healthy diets, productive and regenerative agriculture, nature conservation and restoration, healthy and productive oceans, diversified protein sources, reduction of food loss and waste, circular economy, digital revolution, rural revitalisation, intergenerational and gender-inclusive measures.
- Implementation of the TNFD (Taskforce on Nature-related Financial Disclosures) framework: valuation and economic internalisation of natural and social capital to address mismatches. There is a need for businesses to tap into nature-related opportunities beyond the current focus on risks.
- Constructing the “global agroforestry commons”: revisiting industrial agriculture from sustainability perspectives and re-evaluating traditional agriculture, including smallholder farming.
- Just transition: A just transition that includes the 870 million people engaged in the agriculture sector worldwide, including indigenous peoples and smallholder farmers.

The role of business, finance, local governments and research institutions

- Businesses and financial institutions with long-term perspectives can be powerful drivers: there is a growing number of institutional investors that have signed the Principles for Responsible Investment (PRI) committing to ESG, with total assets under management of approximately USD 3,700 trillion in 2020. Companies are in the midst of transformation and need to transition by balancing short-, medium-, and long-term perspectives.
- Role of local governments: it will be vital to take advantage of the diverse resources unique to respective regions, requiring innovation and the development of mechanisms tailored to each region. A good balance between a long-term vision for the future sustainability of the region and a response to the needs of the current generation is required.
- Role of science: valuing natural and social capital, measuring subtle changes in nature caused by climate and other global changes, discovering novel and nature-based values, etc.

Session 4 Circular Economy and Countermeasures for Marine Plastic Litter

Session Chair:

- Raimund BLEISCHWITZ
Scientific Director, Leibniz Centre for Tropical Marine Research (ZMT)

Speakers:

- Stientje van VELDHOVEN
Vice President and Regional Director, World Resources Institute Europe / Former Minister for the Environment and Housing, Kingdom of the Netherlands
- SARAYA Yusuke
President and CEO, SARAYA Co., Ltd.
- Benjamas CHOTTHONG
Program Director, Thailand Environment Institute (TEI)
- Sylvain AGOSTINI
Assistant Professor, Shimoda Marine Research Center, University of Tsukuba
Director, Tara Ocean Japan
- FUJIWARA Masaaki
Chair of International WG, Japan Clean Ocean Material Alliance (CLOMA) / Executive Officer/ Deputy Division COO, Sustainability Management Division, Suntory Holdings Limited

Opportunities of a circular economy

- The circular economy presents a range of opportunities for Japan, creating synergies with industrial decarbonisation and other decarbonisation efforts. It is estimated that 36% of greenhouse gas emissions can be reduced through resource circulation in Japan. It also contributes to resource security by generating value in Japan rather than depending on imports. Furthermore, the circular economy provides synergies with water management and food security, and thus, can serve as a vision for the future economy and society. It presents a model to better manage resources and the natural environment, both locally and globally. While current resource circularity generally remains low, multiple cases of circular economy applications can be implemented and upscaled. Cases for “nature-based solutions”, such as growing seaweed, are compelling. Altogether, the circular economy can be seen as a key policy lever towards the green transformation (GX).
- Managing resources sustainably requires measurement. Monitoring tools such as the Ellen MacArthur’s Circulytics⁷ or the Circularity Gap Reporting Initiative⁸ help stakeholders such as businesses measure and report their progress towards a circular transition. Japan should ensure that circularity is measured properly, e.g. based on material flow analysis, and include estimates of anthropogenic stocks.

⁷ <https://ellenmacarthurfoundation.org/resources/circulytics/overview>

⁸ <https://www.circularity-gap.world/>

- National and local policy measures should extend eco-design and green public procurement. They should incentivise “design for re-use and recycling” standards, circular business models, and set reduction targets, e.g., for plastics. Experiences from the EU and its member states could serve as regulatory models for adopting a new circular action plan targeting the entire lifecycle of products, from eco-design to environmental information disclosure, thereby encouraging sustainable consumption. Those efforts could become key pillars in the GX roadmap for Japan.
- International cooperation is crucial: the Global Alliance on Circular Economy and Resource Efficiency (GACERE)⁹ and the Platform for Accelerating the Circular Economy (PACE)¹⁰ should be strengthened. Japan could undertake initiatives to agree with international partners on core indicators and monitoring frameworks at different levels, as well as on common standards for product design. Japan should also help establish policy learning about market development for new circular products.

Mapping and monitoring the plastic pollution crisis

- Valued for its durability, strength and lightweight, plastics have rapidly become an unavoidable component across our production and consumption systems. However, their leakage into the ocean constitutes major risks for marine ecosystems and food; if unabated, this could turn into a planetary crisis impacting our ecosystems, biodiversity, and human health. This is mainly due to their difficulty to biodegrade, meaning that, once they are no longer serviceable, they stay and fragment into microplastics, leaking into our environments with unforeseeable consequences. It should also be acknowledged that current technologies suggest no possibility to eradicate microplastics that have widely penetrated our environments. If unabated, such trends are likely to undermine the potential for blue carbon solutions.
- We recognise the increasing severity of plastic pollution along the Japanese coastlines. The conference also revealed disturbing insights into the situation in Thailand, although domestic efforts to counter marine litter are on the way. Hence, mapping and monitoring are key to better managing plastic waste and mitigating impacts. Large-scale field surveys and impact-oriented studies have been conducted in Japan and overseas, evidencing the presence of microplastics in all collected samples from both surface water and sediment.
- Research is gathering further evidence on the effects of microplastics on coastal ecosystems. Additionally, methodologies and monitoring tools are being developed to map the fluxes of microplastics from land into the oceans. Further, collecting data on the presence, sources and impacts of marine plastic litter in developing countries will be critical to minimise the impacts of plastics. Evidence of the negative impacts from discarded fishing gear is becoming clear.
- Supporting policy-oriented research on ocean health and marine food supply will be key to informing decision-making and fostering innovation for plastic-free roadmaps. Data collection and monitoring tools should be accelerated and harmonised at the international level to build

⁹ <https://www.env.go.jp/recycle/circul/gacere.html>

¹⁰ <https://pacecircular.org/>

knowledge on cumulated plastics, especially in hot-spots, and track progress towards their reduction and cleaning-up. Similar to carbon reporting, mapping plastic emissions by countries and main plastic producers will be key to ensuring accountability.

- Plastics are a visible and tangible issue serving as a vehicle to spur environmental protection activities. Special attention should be given to the younger generation through dedicated communication channels. Initiatives to crowd-source data virtually are crucial to forming IT-based partnerships across coastal communities and empowering vulnerable groups.

Accelerating the shift to a circular economy for plastics

- The main barriers to plastic circularity are poor waste sorting and municipal waste management systems, and the lack of Extended Producer Responsibility¹¹ for industries producing and importing plastic packaging. The current plastic recycling rate does not reflect the reality that the vast majority of plastic is simply incinerated for energy recovery. For instance, a B2B (“bottle-to-bottle”) approach is preferable; efforts should be accelerated with a perspective to end plastic pollution. Another obstacle is the limited demand for recycled plastics.
- At the upstream level, large producers such as the food and beverage industry and the fishing industry should aim at zero waste, foster the development of innovative alternatives, and lead actions to mitigate plastic pollution. Available alternatives including biodegradable plastics and circular product designs should be clearly defined and communicated. In contrast, dubious claims of being “bio-based” should be assessed via lifecycle analyses and questioned in public debates. The urgent shift to a circular system for plastics will require industry-wide standards and multi-stakeholder engagement. Green transformative cases especially in the food and beverage industry promote good practices for circularity. Business partnerships spearheading circular alternatives such as the Japan Clean Ocean Material Alliance (CLOMA)¹² should be expanded and shared globally.
- On the consumption side, avoidable plastic products should be drastically reduced by changing expectations and behaviours. If necessary, bans should be considered. Engaging retailers and raising public awareness on plastic pollution and its threats to the ocean, land and human health will contribute to reducing unnecessary plastic consumption. Involving art and influential figures is also a powerful means to raise awareness on environmental and waste-related issues. The general public should also be informed about new alternatives and opportunities brought by the transition to a circular economy.
- In the post-consumption stages, priority should be given to restricting the disposal of recyclable plastics, illegal dumping and illicit exports. Technological opportunities to increase waste collection and sorting efficiency should be deployed. Blockchain tracing systems can enable further upscaling and new business models. Industry-specific requirements to collect used products should be set along with the development of Extended Producer

¹¹ Extended Producer Responsibility (EPR): Environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle.

¹² <https://cloma.net/>

Responsibility policies. Deposit-return schemes¹³ are key to closing the loop, as seen in the Netherlands.

- Ultimately, missions to become “nature-positive” should be encouraged, for both private and public sectors, through the GX roadmap.

Fostering international cooperation to overcome the transboundary plastic crisis

- The G20 Osaka Blue Ocean Vision shared in 2019 and the UN Environment Assembly’s resolution 5/14¹⁴ adopted in March 2022 played key roles in putting plastic pollution on the global agenda. With a view to Japan’s G7 presidency in 2023, efforts should be renewed and include action on combatting marine plastic litter, and upscaling sustainable fishery and marine food, as well as marine renewable energies. Leading by example will be as important as setting up new partnerships.
- Negotiations for a legally-binding international framework agreement on marine plastic litter are about to start. Japan should take a leading role and undertake efforts towards an ambitious international agreement on plastic pollution. Its goal should underline the precautionary principle, for instance by stating that dangerous interference of plastic litter with marine ecosystems and health should be prevented. It will also be important to include the accountability principle by addressing comprehensively all aspects of the plastic lifecycle and its stakeholders; major sectors such as food and beverages, fisheries, and coastal tourism could be explicitly mentioned. Setting up a monitoring and reporting framework will be pivotal. In line with this, a coordinated system of national reporting platforms could be set up by 2025 with a task to engage with stakeholders and foster policy learning. Given the urgency, a circular system for plastics that significantly reduces plastic pollution should be envisaged as soon as possible, by the year 2030, in line with the SDGs.
- The use of official development aid (ODA) and new financial mechanisms to further promote the circular economy and actions against marine plastic litter in developing countries is encouraged, to support capacity building for waste sorting and management, the collection of marine waste, and blue economy innovation in developing countries.
- Going forward, it will be crucial to ensure synergies between national roadmaps at the international level to achieve the reduction of plastic pollution across sectors and product lifecycles, as well as implement net-zero carbon strategies and ocean accounting efforts.

¹³ Deposit-return schemes: A deposit fee is charged at the point of purchase of a product (mostly beverage bottles), and refunded to the purchaser when the bottle is returned via a specifically designed system.

¹⁴ https://wedocs.unep.org/bitstream/handle/20.500.11822/39812/OEWG_PP_1_INF_1_UNEA%20resolution.pdf