EXPO 2025 Green Vision

March 2025

Japan Association for the 2025 World Exposition

Sustainability Bureau

Contents

Introduction

In order to achieve the SDGs, the "Expo 2025 Osaka, Kansai, Japan ('Expo 2025 Osaka, Kansai, Japan')" to be held from April 13, 2025, aims to manage the effects on the environment and society appropriately and to operate the Expo in a sustainable manner. At the same time, the Expo will present to the world a new form of challenge to global environmental issues.

For this purpose, Japan Association for the 2025 World Exposition (hereinafter referred to as “Expo Association ”), the organizer of Expo 2025 Osaka, Kansai, Japan, established an Expert Committee on Sustainability (Chairperson: Motoshige Ito, Professor Emeritus of the University of Tokyo). The Committee deliberates on measures to achieve sustainability, etc., and in April 2022 formulated the“ Sustainability Policy ofExpo 2025 Osaka, Kansai, Japan ”, which presents the basic concept and stance of a sustainable Expo 2025 Osaka, Kansai, Japan. This policy is presented externally to all interested parties (Administrative organizations, suppliers, licensees, citizens, visitors, etc.), including each and every one of Expo Association. Expo Association will understand this policy, act toward the operation of the Expo in a sustainable manner, and disseminate it widely. In this policy, as an axis to consider Expo 2025 Osaka, Kansai, Japan's theme of life, Expo Association has established three subthemes: Saving Lives, Empowering Lives, and Connecting Lives. Based on these subthemes, the following five major goals are set out in the direction of activities using the five Ps of the SDGs.

These five Ps are comprehensive and comprehensive, each of which is closely related, and the second P (Planet) defines the following as the direction of the Expo.

> The Association aims to develop and operate venues that contribute to the realization of international agreements (such as Paris Agreement, Osaka Blue Ocean Vision and Kunming-Montreal Global Biodiversity Framework).
>
> [Direction to pursue]
>
> ①① The Expo strives to reduce greenhouse gas emissions by introducing CO_2 emissions reduction technology, energy conservation technology and renewable energy.
>
> ②② The Expo shall use resources effectively by actively leveraging the 3R initiatives (Reduce, Reuse and Recycle) and procuring renewable materials.
>
> ③③ The Expo shall conserve and restore the natural environment and ecosystems around the venue where there are important ecological hubs in the coastal zone in the Osaka region.

These issues have already been discussed by the Sustainability Expert Committee in the form of the Sustainability Action Plan. However, decarbonization and resource recycling, among other areas of sustainability, have many stakeholders and are of high interest, and since 2021, the policies and status of these efforts have been compiled in the form of the "EXPO 2025 Green Vision" (hereinafter referred to as the "Green Vision"). Since 2023, the Green Vision has been revised to include the natural environment, and since 2024, to include cross-cutting issues.

In Expo 2025 Osaka, Kansai, Japan, it is necessary to promote efforts from two perspectives. The first is to promote efforts for carbon neutrality, a recycling-oriented society, and a society in symbiosis with nature, using technologies that can be adopted at the present time in 2025 while being advanced and economical. The second is to show and experience advanced technologies and mechanisms that need to be developed in order to realize a decarbonized society in Japan in 2050 and a recycling-oriented society and a society in symbiosis with nature in

2050. We will promote efforts from these two perspectives.

In this Green Vision, in order to present the realization of carbon neutrality, efforts for resource recycling and biodiversity, and a carbon-neutral society, a recycling-oriented society, and a society in which biodiversity is ensured in 2050, while taking into consideration human rights, health, and safety, specific efforts and future issues are organized into the decarbonization section, the resource recycling and recycling economy section, the natural environment section, and cross-cutting items under the following concepts:

(1)	Introduction of advanced/economical technologies and mechanisms
(2)	Introduction of technologies and mechanisms covering both supply and demand
(3)	Introduction of mechanisms to promote the understanding of visitors and to change behavior
(4)	Implementation of demonstration and implementation projects covering a wide area including not only inside the venue but also outside the venue
(5)	Green Growth Strategy/Promotion of initiatives covering both supply and demand in key industries
(6)	Promotion of participation of various entities such as start-ups, private companies, and private organizations

The decarbonization section was prepared after deliberation by the Decarbonization Working Group (Chairperson: Professor Yoshiyuki Shimoda, Osaka University) under the Expert Committee on Sustainability. After touching on the climate change goals and social movements of the world and the Japanese government, the following were described based on the examination to date: (1) efforts to achieve carbon neutrality by using technologies that can be adopted while being advanced and economical as of 2025, and (2) how to exhibit advanced decarbonization technologies for energy that should be developed to achieve carbon neutrality in Japan by 2050. ①, the emissions calculated so far, the reduction measures, and the targets based on them were presented. ②, the direction of actual exhibitions and candidate countermeasure technologies were presented, and the implementation and exhibition of hydrogen technology, carbon recycling technology, energy saving technology, and renewable energy technology were specified. The Resource Circulation and Circular Economy section was deliberated by the Resource Circulation Working Group (Chairperson: Yuko Sakita, a journalist and environmental counselor) under the Expert Committee on Sustainability. Regarding waste such as plastics and food generated daily in the venue, the basic concept of initiatives based on the "Osaka Blue Ocean Vision" shared at the G20 Osaka Summit, the system for recycling plastic resources, and the reduction of food waste were presented, and the projected amount of waste, countermeasures, and targets were presented. Regarding waste reduction and recycling measures, concrete measures were presented for containers and packaging, food containers, etc. based on the discussions at the Resource Circulation Working Group held 4 times so far. In addition, the targets for reduction and reuse related to the venue construction, and the measures for reuse at facilities equipments were summarized.

In the natural environment section, in addition to the previous initiatives, joint studies with nature conservation organizations and other NGOs, and cooperation with the project promoted by Osaka Prefecture and Hyogo Prefecture to realize the "Osaka Bay MOBA Link Initiative" are described.

Finally, as cross-cutting issues, the following are described as initiatives for young people and children: experiential programs, on-site tours, and Web contents. Co-Design Challenge program, Expo 2025 Official Experiential Travel Guides, and Theme Week are also described as one of the ways in which small and medium-

sized enterprises (SMEs) can utilize the program.

This Green Vision initiative cannot be implemented solely at Expo Association, and we will seek cooperation from governments such as the Ministry of Economy, Trade and Industry, the Ministry of the Environment, the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of Land, Infrastructure, Transport and Tourism, as well as local governments such as Osaka Prefecture and Osaka City, corporations, and citizens.

I. Decarbonization Part

1. Domestic and International Developments in Decarbonization

The international framework for reducing greenhouse gas emissions that cause global warming has been under discussion since the Kyoto Protocol came into effect in 2005. In December 2015, at the 21 Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) held in Paris, the Paris Agreement was adopted as a fair and effective framework with the participation of all countries. The Paris Agreement set a global long-term goal of keeping the average temperature increase from pre-industrial levels well below 2° C (the 2° C target) and limiting it to 1.5° C, and of balancing anthropogenic greenhouse gas emissions and anthropogenic absorption in the second half of this century. In addition, an agreement was reached for further promotion of global warming countermeasures, including the requirement for each country to formulate a long-term low-greenhouse gas development strategy and to update the target to a higher greenhouse gas reduction every 5 years. According to the 6th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), it is highly necessary to reduce CO_2 emissions to net 0 or negative by the early 2050s in order to keep the temperature increase below 1.5 ° C.

In its Global Warming Countermeasures Plan (approved by the Cabinet in February 2025), our country aims to achieve net 0 greenhouse gas emissions by 2050, in other words, by 2050, based on the idea that measures against global warming are no longer a constraint on economic growth, but that proactive measures against global warming will transform the industrial structure and society and lead to significant growth. In addition, as an ambitious target consistent with the 2050 target, Japan aims to reduce greenhouse gas emissions by 46% from the FY 2013 level by FY 2030, and will continue to take on the challenge of achieving a higher level of 50%. In addition, as an ambitious target consistent with the global 1.5° C target and on a linear path toward achieving net 0 emissions by 2050, our country aims to reduce greenhouse gas emissions by 60% and 73% from the FY 2013 level by FY 2035 and FY 2040, respectively.

The 7th Energy Master Plan (approved by the Cabinet in February 2025) sets forth the following energy policy directions toward FY 2040, with the aim of achieving carbon neutrality by 2050.

- Given our country's unique circumstances, such as its lack of readily available resources and its land surrounded by mountains and deep seas, from the viewpoint of achieving both stable energy supply and decarbonization, Japan will introduce renewable energy as its main power source as much as possible, and aim for a balanced power source configuration so as not to rely excessively on specific power sources and fuel sources.
- In order to realize a transition to a resilient energy supply-demand structure that can withstand an energy crisis, Japan will promote thorough energy conservation and fuel conversion in the manufacturing industry, and make maximum use of power sources that contribute to energy security and have high decarbonization effects, such as renewable energy and nuclear power.

●

Furthermore, the GX2040 Vision (approved by the Cabinet in February 2025) sets out the medium- to long-term direction of the GX (Green Transformation) policy, which aims to achieve a stable energy supply, economic growth, and decarbonization at the same time. In addition to efforts to realize the industrial structure that Japan aims for, and the promotion of GX industrial location, such as the acceleration of industrial agglomeration through the use

of decarbonization power sources, Japan will promote efforts in individual fields, including energy, to accelerate GX.

Toward a decarbonized society, an increasing number of local governments have announced their commitment to achieving net-zero carbon emissions by 2050. Osaka Prefecture and Osaka City, the hosts of Expo 2025 Osaka, Kansai, Japan, have also announced their commitment to 0 carbon cities by 2050, and are further promoting their efforts toward decarbonization.

Climate change and energy issues are also affecting the economy and finance. In June 2017, the Task Force on Climate-related Financial Disclosures (TCFD), which was established by the Financial Stability Board (FSB) at the request of the Group of 20 Finance Ministers and Central Bank Governors, formulated recommendations to promote consistent, comparable, reliable, clear, and efficient disclosure of information on climate change factors in order to facilitate appropriate investment decisions, based on the belief that climate change could undermine the stability of the financial system. The recommendations recommend companies to understand the risks and opportunities of climate change that affect their business activities, and to disclose governance, strategy, risk management, and metrics and targets. In our country, at the TCFD Summit hosted by the Ministry of Economy, Trade and Industry in 2020, former Prime Minister Suga announced that Japan would contribute to global decarbonization by creating innovations that achieve "Beyond 0" to reduce cumulative CO_2 emissions, and by presenting a picture of a "virtuous cycle of environment and growth," and that the Japanese government would support the TCFD. The Corporate Governance Code (CGC), which was revised in June 2021, requires companies listed on the Prime Market of the Tokyo Stock Exchange to disclose information based on the TCFD or an equivalent framework. Although the TCFD ceased its activities in October 2023, the International Sustainability Council (ISSB), established under the International Accounting Standards (IFRS) Foundation, has continued its efforts, and non-financial information disclosure continues to be regarded as important. In Japan, the Sustainability Standards Committee (SSBJ) of the Financial Accounting Standards Institute (FASF) published the Japanese version of sustainability disclosure standards based on the ISSB standards (March 2025).

2. Venue Management for Carbon Neutrality

(1) Greenhouse Gas Emissions Calculation Method

In Expo 2025 Osaka, Kansai, Japan, efforts will be made to achieve carbon neutrality by using advanced, economical, and adoptable technologies and mechanisms. As a premise for efforts to reduce greenhouse gas (Hereinafter referred to as "GHG".) emissions, GHG in BAU without any special measures will be calculated.

For calculation of emissions, for the first time as an international exposition and a large-scale domestic event, GHG Protocol A Corporate Accounting and Reporting Standard(Hereinafter referred to as "GHG Protocol Corporate Standard".) and Corporate Value Chain (Scope 3) Accounting and Reporting Standard(Hereinafter referred to as "GHG Protocol Scope 3 Standard".) will be used as the main methods for the following reasons.

- The GHG Protocol is a rapidly spreading calculation method and it is also used in TCFD, etc. The method of GHG emission calculations by Japanese companies is generally based on this. Therefore, it is easy to understand.
- Reduction efforts in Scope 1 and 2 = Current Expo Association recognizes that these are reduction items

that can be made, and it is the driving force to implement them.

However, in past major events such as the Olympics and World Expos, calculations have not been made in full accordance with the GHG Protocol. Therefore, Expo 2025 Osaka, Kansai, Japan will set original boundaries (evaluation scope) by referring to the GHG Protocol more than in past events.

Organizational boundaries:

Under the GHG Protocol operator standards, a business entity is the basic organizational unit, and organizational boundaries are required to be set based on the ownership ratio or financial and managerial control. In Expo 2025 Osaka, Kansai, Japan, entities other than Expo Association, which is the host entity, such as participating countries and participating businesses, are considered as an integral entity, and are the organizational boundaries for calculation.

Activity boundaries:

Under the GHG Protocol Corporate Standard, activity boundaries for calculation are required to be set within the established organizational boundaries. In Expo 2025 Osaka, Kansai, Japan, direct GHG emissions (Scope 1) and indirect GHG emissions (Scope 2, 3) at the organizational boundaries established above will be covered. In addition, GHG emissions from visitor activities will be added to the scope of calculation as indirect emissions (Scope 3), referring to GHG emissions calculations at major events in the past. The GHG emissions assumed for each Scope and Scope 3 categories assumed for Expo 2025 Osaka, Kansai, Japan are as follows:

1)Scope 1 emissions

CO_2 emissions from the following and GHG emissions associated with HFC leakage

- Fuel used for transportation at facilities in Yumeshima venue, Expo 2025 Osaka, Kansai, Japan (Hereinafter referred to as "inside the venue".)
- HFC leakage due to the operation of air conditioners in facilities at the facilities inside the venue and the facilities in the parking lot outside the venue (Expo 2025 P&R parking lot)

2)Scope 2 emissions

CO_2 emissions from the following

- Facilities inside the venue and electricity used for transportation inside the venue
- Electricity and heat used at the Expo Association Office and facilities in the parking lot outside the venue (Hereinafter referred to as "outside the venue".)

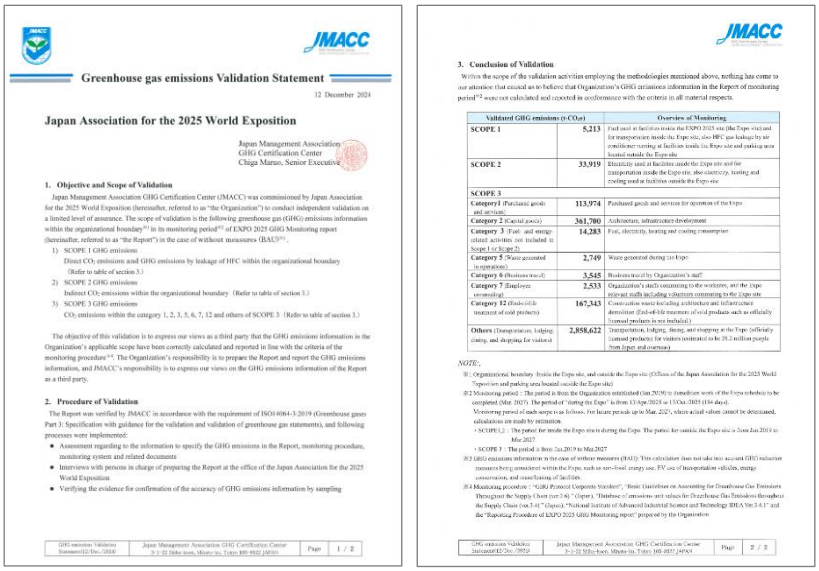
3)Scope 3 Emissions

CO_2 emissions from Scope 3 categories 1, 2, 3, 5, 6, 7, 12 and others in the following business activities

- Category 1 (Purchased goods and services): Purchased goods and services for operation of the Expo
- Category 2 (Capital goods): Architecture, infrastructure development
- Category 3 (Fuel- and energy-related activities not included in Scope 1 or Scope 2): Fuel, electricity, heating and cooling consumption
- Category 5 (Waste generated in operations): Waste generated during the Expo

- Category 6 (Business travel): Business travel by Organization's staff
- Category 7 (Employee commuting): Organization's staffs commuting to the worksites, and the Expo relevant staffs including volunteers commuting to the Expo site
- Category 12 (End-of-life treatment of sold products): Construction waste including architecture and infrastructure demolition (End-of-life treatment of sold products such as official licensed products is not included.)
- Others (Transportation, lodging, during, and shopping for visitors): Transportation, lodging, during, and shopping at the Expo (officially licensed products) for visitors (estimated 28.2 million people from Japan and overseas)

The GHG emissions calculation results have been validated by a third party to ensure that they are correctly calculated and reported based on the calculation procedures established by Expo Association.



Greenhouse gas emissions Validation Statement

12 December 2024

Japan Association for the 2025 World Exposition

Japan Management Association
GHG Certification Center
Chiga Maruo, Senior Executive

1. Objective and Scope of Validation

Japan Management Association GHG Certification Center (JMACC) was commissioned by Japan Association for the 2025 World Exposition (hereinafter, referred to as "the Organization") to conduct independent validation on a limited level of assurance. The scope of validation is the following greenhouse gas (GHG) emissions information within the organizational boundary[*1] in its monitoring period[*2] of EXPO 2025 GHG Monitoring report (hereinafter, referred to as "the Report") in the case of without measures (BAU)[*3] .

1) SCOPE 1 GHG emissions
Direct CO_2 emissions and GHG emissions by leakage of HFC within the organizational boundary (Refer to table of section 3.)
2) SCOPE 2 GHG emissions
Indirect CO_2 emissions within the organizational boundary (Refer to table of section 3.)
3) SCOPE 3 GHG emissions
CO_2 emissions within the category 1, 2, 3, 5, 6, 7, 12 and others of SCOPE 3 (Refer to table of section 3.)

The objective of this validation is to express our views as a third party that the GHG emissions information in the Organization's applicable scope have been correctly calculated and reported in line with the criteria of the monitoring procedure[*4]. The Organization's responsibility is to prepare the Report and report the GHG emissions information, and JMACC's responsibility is to express our views on the GHG emissions information of the Report as a third party.

2. Procedure of Validation

The Report was verified by JMACC in accordance with the requirement of ISO14064-3:2019 (Greenhouse gases Part 3: Specification with guidance for the validation and validation of greenhouse gas statements), and following processes were implemented:

- Assessment regarding to the information to specify the GHG emissions in the Report, monitoring procedure, monitoring system and related documents
- Interviews with persons in charge of preparing the Report at the office of the Japan Association for the 2025 World Exposition
- Verifying the evidence for confirmation of the accuracy of GHG emissions information by sampling

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3. Conclusion of Validation

Within the scope of the validation activities employing the methodologies mentioned above, nothing has come to our attention that caused us to believe that Organization's GHG emissions information in the Report of monitoring period[*2] were not calculated and reported in conformance with the criteria in all material respects.

Validated GHG emissions (t-CO_2e)		Overview of Monitoring
SCOPE 1	**5,213**	Fuel used at facilities inside the EXPO 2025 site (the Expo site) and for transportation inside the Expo site, also HFC gas leakage by air conditioner running at facilities inside the Expo site and parking area located outside the Expo site
SCOPE 2	**33,919**	Electricity used at facilities inside the Expo site and for transportation inside the Expo site, also electricity, heating and cooling used at facilities outside the Expo site
SCOPE 3		
Category 1 (Purchased goods and services)	**113,974**	Purchased goods and services for operation of the Expo
Category 2 (Capital goods)	**361,700**	Architecture, infrastructure development
Category 3 (Fuel- and energy-related activities not included in Scope 1 or Scope 2)	**14,283**	Fuel, electricity, heating and cooling consumption
Category 5 (Waste generated in operations)	**2,749**	Waste generated during the Expo
Category 6 (Business travel)	**3,545**	Business travel by Organization's staff
Category 7 (Employee commuting)	**2,533**	Organization's staffs commuting to the worksites, and the Expo relevant staffs including volunteers commuting to the Expo site
Category 12 (End-of-life treatment of sold products)	**167,343**	Construction waste including architecture and infrastructure demolition (End-of-life treatment of sold products such as officially licensed products is not included.)
Others (Transportation, lodging, during, and shopping for visitors)	**2,858,622**	Transportation, lodging, during, and shopping at the Expo (officially licensed products for visitors (estimated to be 28.2 million people from Japan and overseas)

NOTE:

※1 Organizational boundary: Inside the Expo site, and outside the Expo site (Offices of the Japan Association for the 2025 World Exposition and parking area located outside the Expo site)

※2 Monitoring period: The period is from the Organization established (Jan.2020) to demolition work of the Expo schedule to be completed (Mar. 2027). The period of "during the Expo" is from 13/Apr/2025 to 13/Oct./2025 (184 day).
Monitoring period of each scope is as follows. For future periods up to Mar. 2027, where actual values cannot be determined, calculations are made by estimation.
・SCOPE1,2 : The period for inside the Expo site is during the Expo. The period for outside the Expo site is from Jan 2019 to Mar.2027
・SCOPE 3 : The period is from Jan.2019 to Mar.2027

※3 GHG emissions information in the case of without measures (BAU): This calculation does not take into account GHG reduction measures being considered within the Expo, such as non-fossil energy use, EV use of transportation vehicles, energy conservation, and reuse/leasing of facilities.

※4 Monitoring procedure : "GHG Protocol Corporate Standard", "Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (ver.3.4) " (Japan), "Database of emissions unit values for Greenhouse Gas Emissions throughout the Supply Chain (ver.3.4) " (Japan), "National Institute of Advanced Industrial Science and Technology IDEA Ver.3.4.1" and the "Reporting Procedure of EXPO 2025 GHG Monitoring report" prepared by the Organization

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Figure I-1 Greenhouse gas emissions validation report

（２） Scope 1 and 2 emissions calculation, reduction methods and targets

The calculation method of Scope 1 and 2 emissions (BAU forecast before the session) is as follows. At the end of the session, actual values will be calculated based on the measurement results until then.

Table I-1 Scope 1 and 2 emissions calculation method

Scope	Emission sources	Method for calculating BAU emissions
1	Fuel used in facilities inside the venue	(Building floor area) × (Emission factor per area)
	Fuel used for transportation inside the venue	(Estimated mileage)/(Fuel consumption) × (Emission factor per fuel)
	HFC leakage due to air conditioning in facilities inside and outside the venue	(Estimated refrigerant amount) × (Refrigerant leakage factor) × (GWP of refrigerant)

Scope	Emission sources	Method for calculating BAU emissions
2	Electricity used in facilities inside and outside the venue	(Building floor area) x (Emission factor per area)
	Electricity used for transportation inside the venue	(Estimated power consumption) x (Emission factor)
	Electricity used in the Expo Association office and parking lot outside the venue (Expo P&R parking lot)	(Estimated power consumption) x (Emission factor)
	Heat consumed at the Expo Association office (Sakishima, ATC)	(Estimated heat consumption) x (Emission factor)

The current calculation results (BAU) based on this and the main reduction methods are as follows.

Table I-2 Scope 1 and 2 Emissions and Reduction Methods *

Scope	Sources of emissions	GHG emissions [t-CO_2e]	Main reduction methods other than energy conservation efforts
1	Fuel used in facilities inside the venue	4,979	—
	Fuel used for transportation inside the venue	162	Introduction of electric vehicles and use of synthetic fuels and biofuels
	HFC leakage due to air conditioning in facilities inside and outside the venue	72	Recommendation for the use of materials and equipment with low GWP
2	Electricity used in facilities inside and outside the venue	31,080	Use of zero-emission energy source electricity
	Electricity used for transportation inside the venue	9	Use of zero-emission energy source electricity
	Electricity used in the Expo Association office and parking lot outside the venue (Expo P&R parking lot)	2,527	Use of zero-emission energy source electricity
	Heat consumed at the Expo Association office (Sakishima, ATC)	302	—
Total **		39,133	

* In addition to these, efforts will be made to reduce by introducing new technologies such as DAC, metanation, and perovskite solar cells. However, the amount of reduction is not large and overlaps with other reduction measures, so the description is omitted.

** Totals may not add up due to rounding.

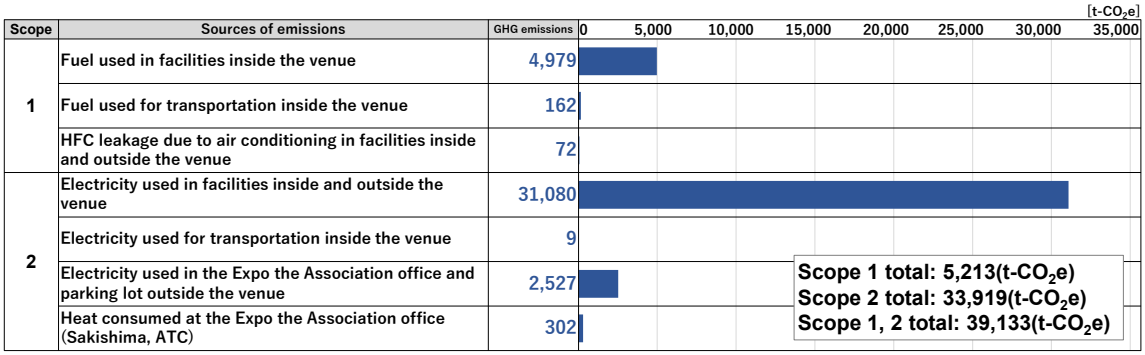

Figure I-2 Illustration of Scope 1 and 2 Emissions

（３） Scope 1 and 2 Emissions Reduction Menu

Scope 1 and 2 emissions will be reduced to zero from the use of electricity in the parking lot inside and outside the venue (Expo Park P & R Parking Lot). Combustion of fuels such as gas and diesel will be reduced by energy saving, electrification, introduction of synthetic fuels and biodiesel. Although the GHG Protocol does not recognize the reduction of the portion for which there are no measures, J-Credit or JCM (hereinafter referred to as carbon credit), which are highly reliable carbon credits, will be used to achieve carbon neutrality. Major initiatives are as follows.

1)Thorough promotion of energy conservation

"Thorough energy conservation" is also stated in the Energy Master Plan, and Expo 2025 Osaka, Kansai, Japan will thoroughly promote energy conservation.

- Introduction of highly efficient district cooling systems

For air conditioning at the venue, a regional cooling system will be introduced in which cold water for air conditioning is produced centrally at a cold water plant and supplied to multiple buildings through conduits. The cold water plants will be distributed in the venue, and by remote monitoring and operation from a central monitoring equipments and automatic control system, efficient operation and visualization will be carried out, such as controlling the number of heat sources, predicting the heat load, and reducing the power to transport cold water.

- Efficiency of Air Conditioning in Pavilions

In each Pavilions, the demand for power and lighting varies depending on the content of the performance, but since the demand for air conditioning is roughly proportional to the area, energy saving efforts can be made in each Pavilions. In addition, it is estimated that about 40% of the energy demand in each Pavilions is for air conditioning on average, so energy saving efforts will be encouraged in each Pavilions with a focus on air conditioning. Specifically, if it is difficult for each Pavilions to make its own efforts, each Pavilions will be encouraged to adopt a system that optimizes air conditioning by installing a large number of sensors on Pavilions and combining it with AI technology. Currently, the system has been introduced in 10 Pavilions, the Association and facilities. We will propose the introduction of the system to Pavilions overseas, and aim to achieve energy saving of about 20% in

Pavilions where the system will be introduced.

- Visualization

By visualizing the energy consumption data of each facilities in the Expo site, we aim to raise energy conservation awareness of each facilities user. When visualizing pavilions, the scale of the exhibition and the number of visitors are taken into consideration, and a system is created in which facilities users who are able to perform efficiently with relatively little energy are evaluated and awarded. In addition, the frequency of updating energy consumption and analysis data is made as detailed as possible, so that it is easy to detect unintended energy consumption such as forgetting to turn off the lights and grasp the situation at the time of use (facilities operations, weather conditions, etc.).

- Reduction measures in Pavilions such as energy saving

With regard to Pavilions, the following standards for decarbonization are presented in "3 -4-2 Energy and Global Environment for Official Participants" and "2 -4-2 Energy and Global Environment for Private Pavilions" of "Design Guidelines for Type A (Self-Built) Pavilions" presented by Expo Association to participants, etc.

2-4-2. Energy and Global Environment C-23 equipments Equipments with high energy consumption performance must be adopted. In Equipments, which is subject to the Top Runner System, Equipments must be adopted, which has achieved the energy saving standard. (However, this does not apply when Lease Equipments and Reuse Equipments are introduced to reduce waste generation.) G-14 As an initiative to achieve net 0 greenhouse gas emissions (carbon neutrality), it is desirable to positively consider energy saving of buildings and introduction of renewable energy in Pavilions design. Expo 2025 Osaka, Kansai, Japan's sustainability standards, which will be formulated in the future, will be announced later. G-15 It is desirable that building hulls (roofs, exterior walls, windows, and floors) adopt methods and materials with high thermal insulation and thermal insulation, and shield solar radiation with eaves, etc. to reduce heat loss and heat acquisition. G-16 It is desirable to adopt methods that directly utilize natural energy such as natural ventilation and natural lighting. G-17 It is desirable to introduce renewable energy equipments such as solar and wind power. G-18 It is desirable to introduce an EMS (Energy Monitoring System) that can grasp the state of energy use by application (Air conditioning, ventilation, certification, hot water supply, outlets, etc.) and Equipments. Efforts should be made to reduce energy consumption through efficient equipments operation by visualizing the state of energy use. G-19 It is desirable to adopt equipments with lower ozone depletion potential and global warming potential. G-20 It is desirable to adopt low-NOx Equipments. *C-00 Control: Restrictions or prohibitions. G-00 Recommendation (Guide): Activities or suggestions expected from participants.

2)Electrification and Use of Decarbonized Power Sources

The Energy Master Plan will make maximum use of decarbonized power sources. The non-electric power sector will also promote electrification. Expo 2025 Osaka, Kansai, Japan will also promote such efforts.

Specifically, electric power with zero emission factor will be introduced in the venue. For example, electric vehicles will be introduced for buses in and around the venue and waste transport vehicles. 1)Electric cold water plants will also be used in the cooling facilities, giving priority to gas cold water plants. Electric power with zero

emission factor will also be introduced in the parking lot outside the venue (Expo Expo P&R parking lot).

3)Proactive introduction of synthetic fuels, biodiesel, etc.

EV vehicles will be introduced for the distribution of waste within the venue, and other vehicles will be encouraged to use fuel-efficient vehicles and synthetic fuels, biodiesel, etc.

In addition, since household waste oil can also be used for biodiesel, the company will encourage the collection and reuse of biodiesel in areas close to Expo 2025 Osaka, Kansai, Japan.

In addition, offset carbon neutral gas will be used for the cooling of facilities inside the Expo site, which is difficult to reduce in real terms. Carbon credits will be used for the offset, and some clean gas certificates that transfer environmental value from e-methane and biogas will also be used. Regarding the use of LPG and other gases inside the Expo site, the Sustainability Procurement Code (Version 3) formulated in May 2024 states "When electricity, city gas or LP gas is used in the venue, carbon neutral gas shall be used." and stipulates that carbon credits will be used. Gas used at Expo Association will be procured according to this code, and participants will be required to use offset gas.

（4） Scope 3 Emissions Calculation, Reduction Methods and Targets

Expo 2025 Osaka, Kansai, Japan's Scope 3 emissions calculation method is as follows.

Table I-3 Scope 3 Emissions Calculation Method

Category	Sources	Method for calculating BAU emissions
Category 1 (Purchased goods and services)	Operation (Purchased goods and services)	(Operating expenses) × (Emission factors corresponding to each expense item)
Category 2 (Capital goods)	Construction	(Total floor area by structural classification) × (Emission factors during construction)
	Infrastructure development	(Development costs by infrastructure type) × (Emission factors for infrastructure development)
Category 3(Fuel- and energy-related activities not included in Scope 1 or Scope 2)	Fuel and electricity use	(Energy consumption in Scope 1 and 2 calculation items) x (upstream emission factor of each energy source)
Category 5 (Waste generated in operations)	Waste generated during the Expo	((Amount of waste processed by each type) x (Waste processing emission factor)) + ((Amount of waste recycled by each type) x (Waste recycling emission factor)) + ((Total amount of waste by each type) x (Waste transport emission factor))
Category 6 (Business travel)	Business travel by Organization's staff	(Estimated business travel cost) x (Emission factor corresponding to each cost item)
Category 7 (Employee commuting)	Organization's staffs commuting to the worksites, and the Expo relevant staffs including volunteers commuting to the Expo site	(Estimated number of commuters) × (Estimated travel distance) × (Passenger transport emission factor)

Category	Sources	Method for calculating BAU emissions
Category 12 (End-of-life treatment of sold products)	Construction waste including architecture and infrastructure demolition	[Demolition work] (Total floor area by structural classification) × (Dismantling emission factor) [Waste treatment] ((Amount of waste treated by type) × (Waste treatment emission factor)) + ((Amount of waste recycled by type) × (Waste recycling emission factor)) + (Total amount of waste by type) × (Waste transport emission factor)
Others: Visitors (estimated 28.2 million people from Japan and overseas)	Travel	(Estimated number of visitors) × (Estimated travel distance) × (Passenger transport emission factor)
	Lodging	(Estimated Number of Visitors) × (Lodging Emission Factor)
	Food and Drink (Inside the Venue)	(Estimated Number of Visitors) × (Estimated Number of Eating Items per Person) × (Estimated Food and Drink Unit Price) × (Restaurant Emission Factor)
	Shopping (Inside the Venue/Officially Licensed Products)	(Estimated Number of Visitors) × (Estimated Emission Factor for Goods Purchased per Person)

Based on this, the current calculation results (BAU) and the main reduction methods are as follows.

Table I-4 Scope 3 Emissions and Reduction Methods

Category	GHG Emissions [t-CO_2e]	Reduction methods
Category 1 (Purchased goods and services)	113,974	Recommendation of energy reduction and use of low-carbon energy in the production and distribution of procured goods
Category 2 (Capital goods)	361,700	Use of lease goods and lumber Use of low-carbon materials
Category 3(Fuel- and energy-related activities not included in Scope 1 or Scope 2)	14,283	-
Category 5 (Waste generated in operations)	2,749	Reducing food loss Food recycling Reducing plastic use (Reusable tableware, etc.)
Category 6 (Business travel)	3,545	Use of low-emission transportation
Category 7 (Employee commuting)	2,533	
Category 12 (End-of-life treatment of sold products)	167,343	Reuse of buildings and Equipments Use of lease goods
Other: Visitors (estimated 28.2 million people from Japan and overseas)	2,858,622	Use of low-emission transportation Use of EV shuttle buses for visitors, introduction of synthetic fuels, etc.
Total *	3,524,747	

*Figures may not add up due to rounding.

Category	Sources of emissions	GHG emissions
Category 1 (Purchased goods and services)	Operation (Purchased goods and services)	113,974
Category 2 (Capital goods)	Construction and infrastructure development	361,700
Category 3(Fuel- and energy-related activities not included in Scope 1 or Scope 2)	Fuel and electricity use	14,283
Category 5 (Waste generated in operations)	Waste generated during the Expo	2,749
Category 6 (Business travel)	Business travel by Organization's staff	3,545
Category 7 (Employee commuting)	Organization's staffs commuting to the worksites, and the Expo relevant staffs including volunteers commuting to the Expo site	2,533
Category 12 (End-of-life treatment of sold products)	Construction waste including architecture and infrastructure demolition	167,343
Others: Visitors (estimated 28.2 million people from Japan and overseas)	Transportation, lodging, during, and shopping at the Expo (officially licensed products)	2,858,622

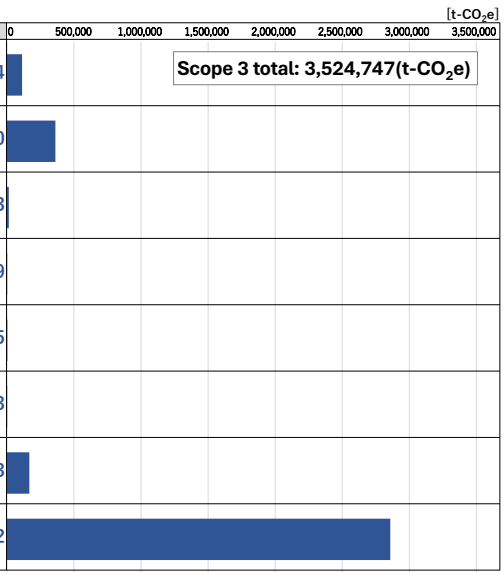

Figure I-3 Illustration of Scope 3 Emissions

Measures to reduce Scope3 emissions include reusing buildings and Equipments, reducing food loss, and reducing the use of plastics. In addition, efforts will be made to reduce light oil used for heavy machinery during the construction of the venue and emissions from traffic directly accessing Yumeshima Island venue by using biodiesel and synthetic fuels, and introducing EVs and fuel-efficient vehicles.

In addition, from the perspective of leaving a legacy, Expo 2025 Osaka, Kansai, Japan will be the starting point for various initiatives, and we will call on all parties concerned to cooperate, and invite them to participate in the EXPO Green Challenge, which will be described later, in order to build a decarbonized society through Expo 2025 Osaka, Kansai, Japan.

（5） Menu for Individual Measures to Reduce Scope 3 Emissions

With regard to Scope 3 emissions, in addition to the initiatives described in the Green Vision Resource Circulation and Circular Economy section, the following initiatives will be promoted.

1)Efforts Through the Supply Chain

The Sustainability-Friendly Procurement Code, which was formulated in June 2022 (revised in May 2024) and published, sets standards for the promotion of energy conservation, the use of low-carbon and decarbonized energy, initiatives that contribute to the reduction of greenhouse gases, and the use of raw materials that contribute to the reduction of greenhouse gases throughout the value chain, and requires suppliers, licensees, Pavilions operators, and their supply chains to comply with the procurement standards. Therefore, efforts will be promoted throughout the entire supply chain, such as the active use of wood.

2)Transportation Demand Measures

In order to realize the safe and smooth movement of EXPO visitors and the minimization of the impact on the flow of people and logistics that support socioeconomic activities in the Osaka and Kansai regions, Expo 2025 Osaka, Kansai, Japan Council on Transportation Measures for Visitors was established in July 2021, consisting of academic experts, relevant administrative agencies, and related organizations, to discuss and coordinate specific measures for transportation of visitors.

In June 2022, Expo 2025 Osaka, Kansai, Japan Basic Policy for Transportation of Visitors was formulated, and in October of the same year, Expo 2025 Osaka, Kansai, Japan Specific Policy for Transportation of Visitors (Action Plan) was formulated, which outlines specific measures to realize the basic policy. The Action Plan was revised once every six months, and the 5th edition was released in December 2024. The Action Plan described measures such as access route planning, traffic management, bicycle parking for visitors by bicycle, and cooperation with large-scale bicycle paths.

3)Introduction of EV Bus for Shuttle Bus Transportation

In addition to operating more than 100 EV buses for the Sakurajima Station Shuttle Bus and the Maishima Expo P & R Parking Area Shuttle Bus, the first initiatives in Japan will be implemented, including the practical introduction of an efficient operation system that combines the energy management of EV buses and the operation management system for crew assignment. In addition, decarbonization will be promoted through the driving demonstration of large vehicles using synthetic fuels produced in Japan.

4)Utilization of Biodiesel in the Construction of the Venue

In the construction work at the Venue, many companies have demonstrated the use of B100 fuel (100% biodiesel fuel) and RD (Renewable Diesel) produced from waste cooking oil in the Construction machines of hydraulic excavators, forklifts, generators, etc. In addition, hydrogen/ethylene mixture gas instead of acetylene is used as a fusing gas in some of equipments works, and concrete efforts are being made to reduce CO_2 emissions and environmental impact in the whole works.

5)Reducing Greenhouse Gases Across the Value Chain

The Sustainability Procurement Code (Version 3) calls for the following points to be considered by suppliers and the value chain when purchasing greenhouse gases. "2.3 Reducing Greenhouse Gases by Other Means Suppliers, etc. should work to reduce the generation of greenhouse gases in the production and distribution of procured goods, etc. Examples include the substitution of non-CFC refrigerants (natural refrigerants) for refrigeration and refrigeration Equipments and the use of offset schemes. 2.4 Use of raw materials that contribute to the reduction of greenhouse gases throughout the entire value chain Suppliers, etc. should select and use raw materials, parts, and fuels that contribute to the reduction of greenhouse gases emitted throughout the entire value chain from the viewpoint of LCA (Life Cycle Assessment) in the manufacturing and distribution of procured goods. Examples include the use of low-carbon materials such as low-carbon concrete and recycled steel."

In addition, regarding GHG emissions from air travel, which is difficult to reduce in real terms, the Sustainability Procurement Code states that "It is recommended to offset greenhouse gas emissions from aircraft transportation of procured goods and other items and from aircraft travel of suppliers and other related parties." and encourages participants who exhibit Pavilions to offset GHG emissions from air travel when they visit Japan. Visitors will also be encouraged to offset GHG emissions from air travel by providing information on the website.

3． Presentation of the Concrete Vision of a Decarbonized Society toward 2050

The Energy Master Plan, which sets out the direction of energy policy toward 2040, states, "In our country, our country aims to reduce greenhouse gas emissions by 60% and 73%, respectively, from 2013 levels in FY 2035 and FY 2040, as ambitious targets consistent with the global 1.5° C target and on a linear path toward achieving net 0 emissions by 2050. However, it is difficult to accurately forecast the future at this point because there are many uncertain factors such as the state of innovation in energy-related technologies as of 2040, trends in energy policies in each country, and progress in DX and GX.

- In considering energy policy toward 2040 in a situation of high uncertainty, it is necessary to pursue all options under the policy of utilizing all available technologies to achieve carbon neutrality by 2050.」 It describes innovations toward carbon neutrality, such as renewable energy and next-generation energy. With a view to achieving both stable energy supply and decarbonization, the government will introduce renewable energy as the main power source as much as possible, and aim for a balanced power source structure that does not depend excessively on specific power sources or fuel sources.
- In order to realize a transition to a resilient energy supply-demand structure that can withstand an energy crisis, the government will promote thorough energy conservation and fuel conversion in the manufacturing industry. The government will also make maximum use of power sources that contribute to energy security and have high decarbonization effects, such as renewable energy and nuclear power.
- In order to realize a transition to a resilient energy supply-demand structure that can withstand an energy crisis, the importance of thorough energy conservation remains unchanged. In addition, electrification and non-fossil conversion will be more important than ever in promoting emission reduction measures toward 2050.
- Hydrogen and other energy are expected to be used in a wide range of fields and are key to achieving carbon neutrality. Decarbonization of thermal power using hydrogen, ammonia, and CCUS will be promoted.
- Since CCUS can achieve decarbonization in fields where it is difficult to achieve decarbonization using electrification and non-fossil conversion using hydrogen, it is essential for achieving stable energy supply, economic growth, and decarbonization simultaneously.
- CDR is necessary as a means to offset residual emissions.

Source: Excerpt from the outline of the 7th Energy Master Plan (approved by the Cabinet in February 2025)

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In Expo 2025 Osaka, Kansai, Japan, referring to the description of the Energy Master Plan, among the technologies and mechanisms of a society that has achieved carbon neutrality, we will show and experience mainly (1) a hydrogen society using hydrogen power generation, etc., (2) the use of renewable energy, (3) CO2 capture and effective utilization technologies such as DAC and metanation, and (4) energy conservation, taking into account the constraints of the period and location. In doing so, we will cooperate with participating countries, participating Pavilions, outside the venue, and participants. In addition, we will proactively promote start-ups that are creating new technologies and innovations, or are expected to do so in the future, in order to spread their technologies and initiatives and attract investment. For such projects and projects that are difficult to maintain, we will hold exhibitions and events in cooperation with governments, participating countries, and participating Pavilions, using theme weeks, etc.

By promoting decarbonization technologies toward the realization of GX not only to visitors but also to the public and the world, and promoting social demonstration, we will contribute to the realization of carbon neutrality on a global scale. By creating new markets and demand, and strengthening Japan's industrial competitiveness, we will put the economy back on a growth path, lead to future economic growth and employment and income expansion, and aim for a prosperous future where all people can live with hope.

（1） A Hydrogen Society Using Hydrogen Power Generation, etc.

At Energy Master Plan, "Hydrogen is a basic material for ammonia, synthetic methane, and synthetic fuels. Hydrogen is expected to be used in a wide range of fields (Steel, chemicals, mobility, industrial heat, power generation, etc.) and is a key energy source for achieving carbon neutrality by 2050." hydrogen related exhibits such as fuel cells, hydrogen carriers, and hydrogen ships will be held outside the venue and in cooperation with Pavilions. The Basic Hydrogen Strategy issued in June 2023 states that "In addition to the current hydrogen introduction targets of up to 3 million tons/year in 2030 and 20 million tons/year in 2050, a new hydrogen introduction target of 12 million tons/year in 2040 (including ammonia) will be set." and the Expo will be an opportunity to promote the use of energy such as hydrogen power generation.

Hydrogen power generation/ammonia power generation is a technology that reduces the amount of natural gas/coal used and decarbonizes the amount of hydrogen/ammonia by co-firing or exclusive firing of existing natural gas/coal-fired power generation. A demonstration project by the Green Innovation Fund is underway. This power generation is expected to contribute to the expansion of demand for hydrogen since a large amount of hydrogen/ammonia demand is expected. This power generation demand is expected to accelerate the construction of a large-scale supply chain of hydrogen/ammonia from overseas and thereby reduce costs.

Japan has technological competitiveness in turbines and supply technologies. In order to advance to the world with this technology in the future, we will supply electricity to the Expo site by hydrogen power generation in advance of these goals, and disseminate the prospect to visitors and the world.

We will introduce hydrogen as much as possible for the procurement of clean hydrogen for hydrogen power generation and other uses within the Expo site. In cooperation with several private Pavilions companies, we will also carry out hydrogen supply chain demonstration projects in which hydrogen derived from renewable energy is

transported by conduit and used in pure hydrogen fuel cells.

Regarding ammonia, we will carry out ammonia combustion power generation using low-carbon ammonia, and aim to contribute to decarbonization of the Expo site by providing environmental value.

（２） Use of Renewable Energy

According to Energy Master Plan, "With regard to the decarbonization of the electric power sector, we will promote the maximum introduction of renewable energy by making it the main power source and strengthening measures in cooperation with relevant ministries and agencies, aiming at coexistence with the local communities and reducing the burden on the people."

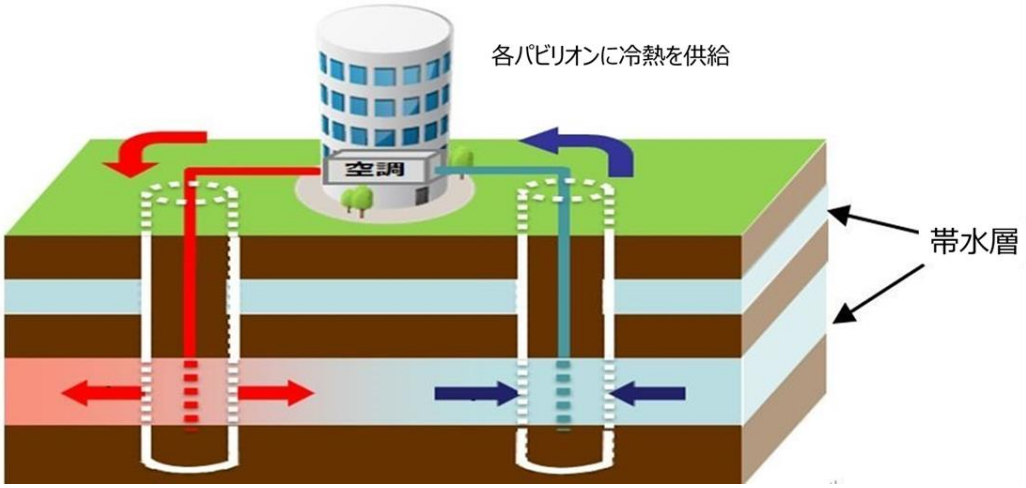
In particular, with regard to solar power generation, from the viewpoint of promoting installation on roofs of buildings with low load-bearing capacity and walls of buildings, etc., where installation of solar power generation has not progressed in the past, we will promote the early social implementation of perovskite solar cells with features such as light weight and flexibility based on the "Next Generation Solar Cell Strategy" formulated in November 2024 by a public-private consultation to expand the introduction of next-generation solar cells and strengthen industrial competitiveness. New technologies such as perovskite solar cells will also be actively implemented and exhibited at the Expo site. Specifically, perovskite solar cells will be installed on the roof of bus stops such as station shuttle buses at Yumeshima Island Terminal 1 adjacent to the West Gate. Since they are light and bendable materials, they can be installed in places where conventional solar cells cannot be installed, and visitors will feel that they can supply electricity for lighting at bus stops. In addition, photovoltaic power generated by megasolar power will be introduced at the Expo site.

Figure I-4 Perovskite Solar Cell Installation Image at Terminal 1

(Courtesy of Sekisui Chemical Industry)

Regarding renewable energy, it is sometimes difficult to exhibit actual equipment due to geographical restrictions of the venue. Among them, major equipment such as offshore wind power generation will be exhibited.

The venue adopts a central heat source system that supplies cold water for air conditioning to buildings such as Pavilions. Aquifer storage equipments, which pre-cools groundwater in winter and uses it as cooling water in summer, and equipments, which uses seawater as cooling water for refrigerators, will be installed as renewable energy. Osaka City is the only city in Japan to introduce aquifer storage. Osaka City has achieved significant reductions in energy consumption and CO_2 emissions as a result of cooling operations, and has great potential for aquifer storage. In cooperation with Osaka City and the Netherlands, which has the world's largest number of installed aquifer storage equipments, we will promote the introduction of aquifer storage as a renewable energy in Japan through exhibitions and other events.



(Reference: Osaka City Environmental Bureau, Consulate General of the Kingdom of the Netherlands in Osaka)

Figure I-5 Aquifer Thermal Storage

（３） CO_2 recovery and effective utilization technologies such as DAC and Methanation

Energy Master Plan calls it "Since CCUS(Carbon dioxide Capture, Utilization and Storage) can achieve decarbonization in areas where it is difficult to achieve decarbonization by electrification or non-fossil conversion using hydrogen, it has become indispensable for the simultaneous realization of stable energy supply, economic growth, and decarbonization. In addition, CDR (Carbon Dioxide Removal) is considered to be necessary as a means of offsetting emissions (residual emissions) from fields where CO_2 emissions cannot be avoided in the end even if maximum emission reduction is carried out in order to realize carbon neutrality by 2050." Therefore, DAC and CO_2-absorbing concrete will be actively used at the venue.

The Carbon Recycling Factory will be set up in the management area southeast of the venue, and the

demonstration of DAC, CO_2 recovery apparatus, and Methanation will be conducted there. DAC is a technology to directly recover CO_2 from the atmosphere, and it requires both the technology to adsorb CO_2 at a low concentration of about 400ppm and the technology to desorb it at the lowest possible energy. Since CO_2 concentration in the atmosphere can be directly reduced, it is a necessary technology for carbon negativity. Bench-scale demonstration will be conducted in the venue. The recovered CO_2 will be supplied to Another equipments as a raw material for Methanation.

In addition, as one of the means of decarbonizing energy sources, it is necessary to "decarbonize gas itself" through innovations on the supply side, such as methanation and hydrogen utilization. For this purpose, among biogas consisting of CO_2 and methane produced by fermentation of garbage, CO_2 is combined with hydrogen produced from renewable energy (methanation), and the synthetic methane produced (e-methane) is transported through piping and used for cooking in the kitchen of the State Guest House and for heat supply equipments.

Technology for efficient separation and recovery of high-temperature, low-pressure, and low-concentration CO2 contained in exhaust gas emitted from boilers in factories is also being developed. In the venue, the recovery of CO2 from exhaust gas will be demonstrated, and the recovered CO_2 will be supplied to Separate equipments as a raw material for methanation.

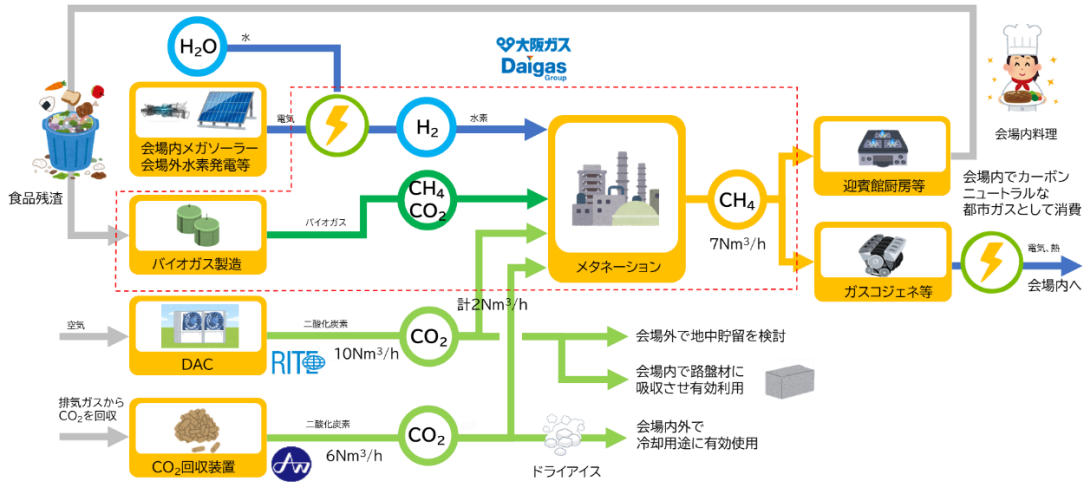


Figure I-6 Overview of the Carbon Recycling Factory

Energy Master Plan also states that "Synthetic fuels have the advantages of being able to utilize existing internal combustion engines and fuel infrastructure, and have the same high energy density as fossil fuels. Synthetic fuels are expected to be used as e-gasoline and e-diesel in the automotive sector, e-methanol in the marine sector, and e-SAF in the aviation sector. The commercialization of synthetic fuels is aimed at by the early 2030s." In light of this, we will demonstrate the running of vehicles using synthetic fuel inside and outside the venue.

As for CO2 absorbing building materials, we used them for facilities inside the venue, roads and benches. In

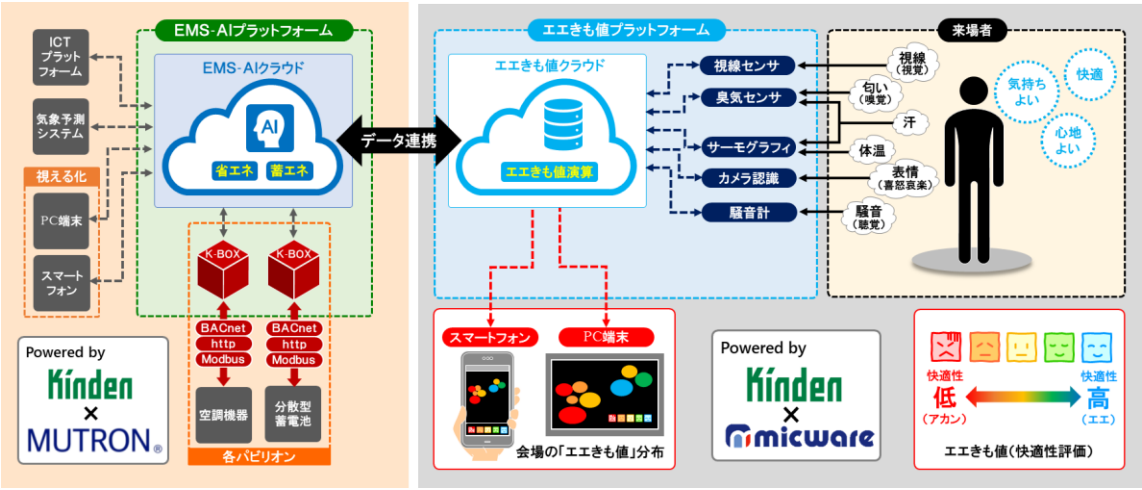
addition to evaluating and analyzing durability, we are working to obtain actual data on CO_2 reduction.

Figure I-7 Sustainability Dome with CO_2 Absorbing Building Materials

（4） Energy Conservation

The energy used at the venue is carbon neutral gas with zero emission factor, but the importance of thorough energy conservation is unchangeable, so Expo Association is supporting energy conservation in each Pavilions. As for Pavilions, Expo Association presents standards for decarbonization in "Design Guidelines for Type A (Self-Built) Pavilions" for "3 -4-2 Energy and Global Environment for Official Participants" and "2 -4-2 Energy and Global Environment for Private Pavilions" (reprinted).

More specifically, in order to reduce the energy used for air conditioning in each Pavilions, an advanced energy management system utilizing AI and sensors will be introduced. This is not energy conservation by enduring the heat and cold, but rather a system that controls the perceived temperature by evaluating comfort, and at the same time achieves comfort for people there. Venture company technology was adopted for the part that utilizes AI.



（© 2023 Kinden Corporation ）

Figure I-8 EMS-AI Energy Management System

（５） Introduction of EV buses for in-venue transportation

EV buses will also be introduced in buses for visitors at the Expo site, and a Fleet Management System (FMS) for managing the operation of EV buses and an Energy Management System (EMS) for efficiently controlling charging will be put into practical use. In addition, new technologies such as autonomous driving at Level 4 and power supply during travel will be combined, and a large-scale demonstration unprecedented in the world will be conducted to demonstrate next-generation mobility and its evolution.

（６） Others

We will actively collaborate with decarbonization exhibits in participating countries and private sector Pavilions, and devise ways to make decarbonization efforts at the Expo site comprehensively visible to visitors about Expo 2025 Osaka, Kansai, Japan's decarbonization efforts.

４． Action Change for the Future (EXPO Green Challenge)

The Global Warming Countermeasures Plan states that "According to a report, households account for about 60% of our country's total greenhouse gas emissions on a consumption basis. In order to realize a decarbonized society, it is necessary for each and every citizen to take measures against global warming." In Expo 2025 Osaka, Kansai, Japan, it is important to promote decarbonization efforts not only by Expo Association and participants at the Expo site, but also by participants and citizens both inside and outside the Expo site, and to create a trigger for action change toward a sustainable society.

For this purpose, even before the Expo, we will invite individuals outside the Expo site through organizations such as companies, schools, and local governments, and work together to implement various CO_2 reduction efforts using EXPO as a trigger so that they can become a legacy toward a decarbonized society, thereby contributing to future

reductions. This initiative is called the EXPO Green Challenge, and the amount of CO_2 reduction will be counted, aggregated, and monitored. The challenge menu, which is the core of this initiative, is especially targeted at individuals, and the EXPO Green Challenge App will be developed to promote action. Through the app, the amount of reduction will be counted, aggregated, and visualized. The app was launched on March 7, 2024. There has been an increase in collaboration between companies and local governments, such as publicizing efforts and encouraging the use of the app within organizations, and we will continue to strengthen collaboration. In addition, points will be awarded for decarbonization activities at venues during the exhibition to further promote efforts.

In addition, the MOZUYAN EXPO Green Donation Box, an initiative to contribute to decarbonization in Expo 2025 Osaka, Kansai, Japan, is being promoted in cooperation with Osaka Prefecture by collecting CO_2 reduction data from participating companies' efforts, converting it into carbon credits, and donating it to the Expo.

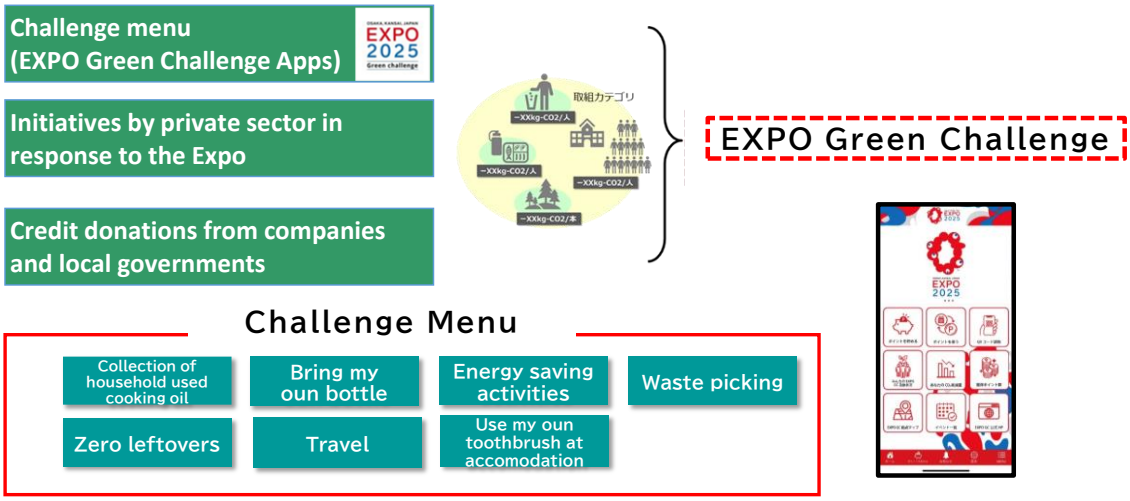


Figure I-9 EXPO Green Challenge

5． Blue Carbon

Under the Osaka Bay MOBA Link Initiative promoted by Osaka and Hyogo Prefectures, Japan will cooperate to create blue carbon credits by increasing CO_2 absorption and fixation through the creation of seagrass beds.

II. Resource Circulation and Circular Economy Part

1. Developments in Japan and Abroad Concerning Resource Circulation and Circular Economy

The global consumption of resources is expected to increase due to economic growth in emerging and developing countries, and the global consumption of resources in 2060 is estimated to more than double the level in 2017. There is concern over the growing environmental impact of resource shortages and resource extraction and consumption. Against this background, global attention has been focused on efforts for sustainable resource use, including in the supply chain. The Sustainable Development Goals (SDGs) set forth "ensuring sustainable consumption and production patterns" as one of the 17 goals to be achieved by 2030.

The Group of 20 Osaka Summit held in June 2019 shared the Osaka Blue Ocean Vision, which aims to reduce the additional pollution from marine plastic waste to 0 by 2050. The Group of 20 Implementation Framework for Measures against Marine Plastic Waste was adopted to implement voluntary initiatives such as (1) proper waste management, (2) marine plastic waste collection, (3) development of innovative solutions (innovations), and (4) international cooperation to strengthen the capacity of each country. In addition, at the resumed session of the United Nations Environment Assembly (UNEA5.2) held in February and March 2022, a resolution was adopted to establish an intergovernmental negotiating committee to develop a legally binding international instrument (treaty) on measures against marine plastic pollution and other plastic pollution. Negotiations have been underway since November 2022.

At the G7 Climate, Energy and Environment Ministers' Meeting in Sapporo, held in April 2023, the Principles on the Circular Economy and Resource Efficiency (CEREP) were adopted with the aim of mainstreaming circular economy and resource efficiency approaches into sustainable business practices and maximizing the impact of the private sector, which is essential for achieving environmental goals such as carbon neutrality and a nature-positive economy. With regard to plastic pollution, Japan is committed to ending plastic pollution with the aim of achieving 0 additional plastic pollution by 2040.

At the G7 Hiroshima Summit held in May 2023, at the session "Common Efforts for a Sustainable World," Prime Minister Kishida stated that "The international community should work together to tackle environmental pollution. The circular economy and resource efficiency approach are effective, and we would like to strengthen our efforts." with regard to the environment, and shared recognition was obtained among participating countries and organizations to strengthen cooperation to advance concrete measures against plastic pollution and marine pollution.

In Japan, in May 2019, the government formulated the "Plastic Resource Circulation Strategy" in order to respond to a wide range of issues such as marine plastic waste, climate change, and stricter regulations on the import of waste from other countries. The basic principles of 3R+Renewable and 6 ambitious milestones ((1) Reduce cumulative emissions of one-way plastics by 25% by 2030; (2) Reuse and recyclable designs by 2025; (3) Reuse and recycle 60% of containers and packaging by 2030; (4) Reuse and recycle 100% of used plastics by 2035; (5) Double recycling by 2030; and (6) Introduce approximately 2 million tons of biomass plastics by 2030.) were set as the direction to be pursued. The Law Concerning the Promotion of Resource Circulation Related to Plastics, which came into force in April 2022, includes measures to promote the recycling of plastic resources by all entities

throughout the life cycle of plastic products, from the design to the waste treatment stage. Based on this, active efforts are being promoted by all entities, such as encouraging the implementation of environmentally conscious design at the design and manufacturing stage, and requiring the rationalization of the use of plastic products such as forks, spoons, table knives, muddlers, and drinking straws, which are provided free of charge to consumers at the sales and provision stage. In addition, the Fifth Master Plan Plan for Establishing a Sound Material-Cycle Society, formulated in August 2024, puts forward the shift to a circular economy in which resources are efficiently and cyclically used in a sustainable manner, and promotes this as a national strategy.

With regard to food, the Fourth Master Plan Plan for Establishing a Sound Material-Cycle Society, formulated in June 2018, set a target of halving household food loss and waste by fiscal 2030 from the fiscal 2000 level. Subsequently, in order to promote the reduction of food loss and waste as a national movement through the cooperation of various entities such as the national government, local governments, businesses, and consumers, the "The Act on Promotion of Food Loss and Waste Reduction" was submitted to the Diet on the initiative of Diet members. The bill was unanimously approved by both the House of Representatives and the House of Councillors, and " The Act on Promotion of Food Loss and Waste Reduction" was enacted in May 2019. The basic policy of the Food Recycling Law, which was revised in July 2019, set a new goal of halving the amount of food loss and waste generated by food-related businesses in the entire supply chain by fiscal 2030 from the fiscal 2000 level (5.47 million tons), taking into account the SDGs, and set targets for the recycling rate by fiscal 2024: 95% in the food manufacturing industry, 75% in the food wholesale industry, 60% in the food retail industry, and 50% in the restaurant industry. In addition, in the revision of March 2024, the reduction target for incineration and landfill was set as a reference value, because awareness of the existence of food waste that has not been recycled will encourage people to reduce the amount of incineration and landfill and increase the recycling rate. In the basic policy of the Food Recycling Law, which was revised in March 2025, the reduction target for business-related food loss and waste by fiscal 2030 will be 60% from the fiscal 2000 level, and the target for recycling rate by fiscal 2029 will be 65% in the food retail industry.

In addition, the basic policy for the promotion of consumer education, which was decided by the Cabinet in March 2023, calls for the promotion of ethical consumption, in which consumers think for themselves and consider people, society, and the environment, including local revitalization and employment, based on the awareness that consumer behavior has a great impact on the economy and society, and that consumption activities themselves are investments toward the future.

Construction recycling is considered to have entered a period of maintenance and stability after the period of development and growth of recycling in the 1990s and 2000s. In the future, improvement in the quality of recycling is expected to become an important issue. the Ministry of Land, Infrastructure, Transport and Tourism formulated the "Construction Recycling Promotion Plan 2020 - Quality oriented recycling" in September 2020 and is promoting construction recycling.

2． Basic Concept of Expo 2025 Osaka, Kansai Initiatives Based on Developments in Japan and Abroad

The following measures will be taken based on the laws and the basic policies based on the laws mentioned in the

“Developments in Japan and Abroad Concerning Resource Circulation and circular economy”.

(General)

- Resource circulation measures at Expo 2025 Osaka, Kansai, Japan consists of two main parts. One is to reduce the amount of daily waste such as food and plastics generated at the Expo site to the maximum extent by reducing and reusing, and to ensure the recycling of sorted and discharged resources. The other is resource cieculation measures at facilities and equipments from the construction of the Expo site to the end of the Expo.
- The aim is to recycle resources in a way that has minimal environmental impact and is the most advanced and feasible method in 2025. However, it should not be decided based on the current environmental impact alone, and multiple methods will be used with a view to the possibility and feasibility of reducing environmental impact in 2050.
- These measures will be implemented from the viewpoint of contributing to decarbonization and promoting the idea of ethical consumption among participants and visitors.

(Measures to deal with waste generated daily at the Expo site)

- With the awareness of the effect of raising awareness to promote behavior change inside and outside the Expo site, participants, visitors, and citizens will participate in the measures, and it will be possible to leave a legacy after the Expo and outside the Expo site. In addition, participants and vendors in the Expo site will be able to work together in an integrated manner.
- Based on the government's basic policy of 3R+Renewable and the priority of food recycling, we will aim to (1) venue management to minimize waste generation, (2) recycle waste as much as possible, and (3) recycle all waste, including heat recovery. In Expo 2025 Osaka, Kansai, Japan, where the amount of waste is particularly high, the following issues should be considered: (1) plastic measures, (2) food waste reduction measures, (3) reduction of paper use, and (4) reuse of facilities equipments.
- Visitors and participants will be encouraged to bring their own bags and their own water bottles, and efforts will be made to reduce waste generation. In addition, efforts will be made to disseminate information on waste generation control, reuse, and waste separation on the official the Association website, and to strengthen public awareness.
- Regarding plastic measures, we will aim ahead of the targets set out in the plastic resource circulation strategy for 2030, such as the reduction of one-way plastics and the reuse and recycling of containers and packaging, with a focus on products using specified plastics as stipulated in the Law Concerning the Promotion of Plastic Resource Circulation.
- Regarding food waste reduction measures and food recycling measures, we will minimize the targets set out in the law, and take measures equivalent to the most advanced measures in Japan, referring to the most advanced measures in Japan.
- Regarding paper, we will reduce paper consumption at a level comparable to international conferences and events as Expo 2025 Osaka, Kansai, Japan, which calls itself the Digital Expo, although there are no immediate targets in Japan.

- After reducing waste emissions, we will thoroughly recycle what can be recycled, and promote heat recovery by incineration as much as possible for waste that is difficult to recycle, and reduce landfill disposal.

(Efforts by facilities and equipments over the entire exhibition)

- We will adopt building structures and methods that are easy to separate when dismantled, simplify and reduce the weight of buildings, and use wood and other renewable resources. We will build Expo venues that take into consideration the global environment and the effective use of resources, such as reusing materials, equipment and buildings after the exhibition as much as possible.
- In addition, when purchasing equipment, etc., purchase and share environmentally friendly items. Make maximum use of leases and rentals, and use recycled and recycled materials.

3. Waste related to venue management

After this section, we estimate waste emissions and set reduction and recycling targets. With regard to recycling, we examined it based on government targets, etc., because legal systems and mechanisms have been developed and ideas are socially organized.

(1) Waste related to venue managemnet (BAU)

The average per capita waste emissions at Expo Aichi, Japan and 2 amusement parks in Japan, facilities, were used as the per capita waste emissions in Expo 2025 Osaka, Kansai, Japan without additional measures. This was multiplied by the estimated number of visitors to Expo 2025 Osaka, Kansai, Japan of 28.2 million to obtain waste emissions (BAU). In addition, waste emissions by type were calculated according to the emission ratio of waste by type at Expo 2025 Aichi, Japan, and were arranged based on the waste classification of Expo 2025 Osaka, Kansai, Japan.

Table II-1 Waste emissions in Expo 2025 Osaka, Kansai, Japan (BAU)

Type	Emissions [t]	Percentage [%]	Unit consumption [g/person]
Cans	42.8	0.4	1.5
Non-plastic bottles	611.5	6.3	21.7
Cans for business use	45.0	0.5	1.6
Plastic bottles	562.8	6.4	22.0
Plastic bottles caps	58.8		
Polystyrene foam / foam trays	5.6	5.8	19.8
Plastics	554.1		
Cardboard	1,711.7	17.6	60.7
Paper	110.4	1.1	3.9
Food waste	1,501.2	15.5	53.2
Waste cooking oil	110.4	1.1	3.9
Combustible waste	4,181.4	43.1	148.3
Compostable dishware			
Disposable chopsticks			
Wooden pallets			
Disposable nappy			
Non-combustible waste / mixed waste	212.8	2.2	7.5
Sludge (Grease trap)			
Total	**9,708.5**	**100.0**	**344.3**

Note: Figures may not match rea values due to rounding.

（２） Targets for Reduction and Recycling

Expo 2025 Osaka, Kansai, Japan has decided to focus on reduction and reuse, and based on the figures in Table II-1 in (1), estimates and targets were set for the amount of waste emitted when individual reduction measures were taken. Recycling targets were also set for the estimated amount of waste emitted after reduction.

Table II-2 Estimated amount of waste emitted after reduction and recycling targets

Type	BAU	Reduction target				Recycling target	
	Emissions [t]	Reduction [t]	Reduction rate [%]	Amount after reduction [t]	Unit consumption [g/person]	Amount recycled [t]	Recycling rate [%]
Cans	42.8	-	-	42.8	1.5	699.3	100.0
Non-plastic bottles	611.5	-	-	611.5	21.7		
Cans for business use	45.0	-	-	45.0	1.6		
Plastic bottles	562.8	188.2	30.3	433.5	15.4	433.5	100.0
Plastic bottles caps	58.8						
Polystyrene foam / foam trays	5.6	139.9	25.0	419.8	14.9	419.8	100.0
Plastics	554.1						
Cardboard	1,711.7	-	-	1,711.7	60.7	1,711.7	100.0
Paper	110.4	61.1	55.4	49.2	1.7	49.2	100.0
Food waste	1,501.2	321.2	21.4	1,179.9	41.8	1,179.9	100.0
Waste cooking oil	110.4	-	-	110.4	3.9	110.4	100.0
Combustible waste	4,181.4	721.9	17.3	3,459.5	122.7	94.6	2.7
Compostable dishware		-					
Disposable chopsticks							
Wooden pallets							
Disposable nappy							
Non-combustible waste / mixed waste	212.8	10.0	4.7	202.8	7.2	19.3	9.5
Sludge (Gease trap)							
Total	**9,708.5**	**1442.3**	**14.9**	**8,266.2**	**293.1**	**4,717.8**	**57.1**

Note: Figures may not match real values due to rounding.

(Reduction targets)

In setting the reduction targets, we examined the reduction measures for each type of waste. Table II-3 below summarizes the reduction measures for each type of waste for which reduction targets have been set. As for reduction measures, some of them are described in Expo 2025 Osaka, Kansai, Japan's various recruitment guidelines and guidelines and are requested from participants. Specific measures will be explained in the next section. Efforts will be made to reduce and reuse emissions more than the target.

Table II-3 Waste Reduction Measures

Type	Reduction measures
Plastic bottles Plastic bottles caps	・Encouraging and raising awareness of bringing own water bottle ・Improving the environment for using own water bottle (Installation of water supply machines, water servers, and washing machines for own water bottles at the Expo site, and supply water to own water bottles at stores)
Plastics Polystyrene foam / foam trays	・Reduction of plastics related to containers and packaging (e.g., prohibition of distribution of plastic bags) ・Use of refill products
Paper	・Proactively digitized items suitable for digitization, such as posters, maps, various tickets, and facilities pamphlets, etc. ・ Reduction of paper use at facilities offices (Two-sided, consolidated printing, use of online meetings, etc.)
Food waste	・Measures to reduce Food waste by participants serving food and drink ・Measures that do not fall under the above categories, such as those for staff meals and parties, are specified and publicized on the Association's official website, etc. ・Calls for visitors to reduce leftovers, etc.
Combustible waste	・Introduction of reused dishware in the food truck area ・Reduction of easily disposed items (fans, etc.)
Non-combustible waste / mixed waste	・Active use of free lending by management participation for items used during the exhibition ・Reuse of equipment using reuse matching services

(Recycling Target)

With regard to recycling, the recycling target for waste other than "Combustible waste" and "Non-combustible waste/mixed waste" is 100% through thorough sorting and re-sorting within the venue.

The target is to recycle used paper cups, paper plates, receipts and other difficult-to-recycle waste paper, compostable dishware (biodegradable plastic), disposable chopsticks, wooden pallets, and disposable nappy (special collection boxes are set up within the Expo site), which would normally be "Combustible waste", with a total recycling target of about 95 tons.

For "Non-combustible waste and mixed waste", umbrellas and other items are separated, and the target is to recycle a total of about 19 tons, including sludge. The overall recycling rate at this stage is about 57%.

（3） Specific Efforts on Waste Reduction and Recycling

Expo 2025 Osaka, Kansai, Japan is working to reduce and recycle plastic and food-related waste, both of which have been promoted in Japan in recent years, and which are generated a lot in the venue management. Plastic measures will include the introduction of reused dishware in the food truck area, the establishment of up to 80 water supply spots in the Expo site for visitors to freely use to promote the use of their own water bottles, the promotion of the sale of their own bags, eco-friendly bags and paper bags, and the prohibition of the sale and distribution of plastic bags. As for food measures, efforts will be made to reduce the generation of food waste through measures such as visualizing the amount of food waste discharged, and the total amount of food waste generated will be recycled through composting. In addition, efforts will be made to publicize the "Guidelines for Proper Waste Disposal, etc.

(Operation Period)," which summarizes the basic matters to be observed by official participants and others for the purpose of promoting proper waste disposal and 3R+Renewable, by making it into multiple languages.

1） Plastic measures

Based on the Osaka Blue Ocean Vision shared at the G20 Osaka Summit, which describes domestic and international trends in resource recycling and circular economy, and the goals of the government's Plastic Resource Recycling Strategy, Expo 2025 Osaka, Kansai, Japan will implement the following measures before and during the exhibition, emphasizing the reduction of one-way (single-use) plastic emissions, design that can be reused and recycled, and thorough reuse and recycling, and will contribute to the prevention of pollution of rivers and oceans by plastic waste.

(Shopping bags)

- The Exposition AssociationExpo Association invites visitors to bring their own bags.
- Only paid eco-bags (including furoshiki) and hand-held paper bags will be provided in the Expo site, and distribution of other bags will be prohibited. Participants will give priority to selling eco-bags over paper bags.
- Handheld paper bags will be recyclable according to the classification of the Exposition AssociationExpo Association. Rain covers will be prohibited.

(Containers and packaging for sales (excluding shopping bags))

- Excessive packaging will be avoided. In addition, efforts will be made to reduce the number of containers and packaging by not proactively distributing them to visitors, but asking them if they are needed.
- Plastics will be prohibited for containers and packaging when they are packaged in the Expo site. The containers and packaging will be recyclable according to the classification of Exposition the Association.
  - ✓ For cushioning materials, the use of plastic is prohibited, and recycling is not required.
  - ✓ The use of reel-wrapped plastic bags will be permitted when food and drink that may be contaminated due to liquid leakage are wrapped in the Expo site.
  - ✓ The use of cold packs will be permitted when food and drink are wrapped in the Expo site.
- When products are wrapped in advance outside the Expo site, a different approach (Introduction of materials that can be recycled as paper and non-plastic materials such as wood and bagasse in the separation category of the Exposition AssociationExpo Association) will be considered, taking into account the location of the Expo.

(Food container and beverage container)

- Reusable dishware will be used when food and drink are served to visitors who eat and drink in sales space plot. However, wrapping paper may be used if it is possible to provide food and drink, but it should not be over-packaged.
- As a general rule, reusable dishware will be used in the food truck area, which has been advertised by

the Exposition AssociationExpo Association, in accordance with the guidelines for business participation. However, in some areas, biodegradable plastic that can be composted together with food waste will be used by the processing company entrusted by the Exposition AssociationExpo Association.

- When single-use containers are used for food to be cooked in the Expo site, recyclable paper will be used according to the classification of the Exposition AssociationExpo Association, and when it is difficult to do so, non-plastic materials will be used.
- Regarding containers and packaging of food and drinks cooked outside the Expo site, priority will be given to recyclable paper according to the classification of the Exposition AssociationExpo Association, and if it is difficult to do so, the use of non-plastic materials will be considered.
- Regarding the provision of tasting, efforts will be made to reduce the number of disposable items. If disposable items are unavoidable, paper, wood, bamboo and non-plastic materials will be used.

(Cutlery, Chopsticks, etc.)

- When serving food and drinks to visitors who eat and drink in sales space plot, reusable cutlery such as forks, spoons, knives, and muddlers and chopsticks will be used.
- As a general rule, reusable cutlery and other materials will be used in the food truck area, which has been advertised by the Exposition AssociationExpo Association, in accordance with the guidelines for business participation. However, in some areas, biodegradable plastics that can be composted together with food waste will be used by the disposal company entrusted by the Exposition AssociationExpo Association.
- When using disposable cutlery and other materials, recyclable paper will be used according to the classification of the Exposition AssociationExpo Association, and if it is difficult to do so, non-plastic materials will be used.
- Lids of drink cup and straws will not be used when serving beverages, and if they are to be used, from the use of non-plastic materials will be considered.
- The disposable chopsticks will be made in Japan and wood and bamboo will be used.
- Regarding the provision of tasting, efforts will be made to reduce the number of disposable items. If disposable items are unavoidable, paper, wood, bamboo and non-plastic materials will be used.
- When using wet towels, give priority to reusable cloth towels. If disposable towels are to be distributed, use cloth that does not contain petroleum-based ingredients. In addition, package materials containing 50% or more biomass should be used.

(Plastic bottles)

- The Exposition AssociationExpo Association encourages visitors to bring their own water bottles, and provides an environment where visitors can use their own water bottles, such as by providing water supply spots and washing machines at the venue. In addition, in cooperation with external parties, we will work to promote the use of own water bottles outside the Expo site, and to ensure that local initiatives continue even after the end of the exhibition.

- When beverages are served as takeout at stores, participants will provide an environment where they can serve beverages in containers such as their own water bottles brought by visitors, and where they can fill their own water bottles with water as requested by visitors.
- In light of measures against heatstroke, beverages in containers such as plastic bottles will also be available for sale, but the Exposition AssociationExpo Association will implement horizontal recycling of used plastic bottles for beverages.

If it is difficult for participants to implement the above specific initiatives, they will be required to submit usage plan and usage report separately designated by the Exposition AssociationExpo Association to understand the actual situation. They will also be required to submit usage plans for items that the Exposition AssociationExpo Association considers necessary to understand the actual situation. Exposition the Association will consider compiling these submitted data and publishing them on the official the Association website, reports to be prepared after the exhibition, etc., in order to organize the reasons for difficulties in implementing the measures and the amount used. The items to be submitted are as shown in Table II-4 below.

Table II-4 Subject to Submission of Usage Plan and Usage Report

Subject	Request for Submission	Usage Plan	Usage Performance Report
Shopping bags	When there is a compelling reason to use shopping bags other than eco-bags or paper bags for handbags *Bags used to distribute materials, novelties, and souvenirs are also covered. *Plastic bags cannot be used (not subject to application)	Submitted	Submitted monthly
Containers and packaging	When using reel-wrapped plastic bags or cold packs	Submitted	Not required
Food containers Beverage containers	When reused dishware cannot be used in sales space plot	Submission	Submission monthly
	When wrapping paper is used in sales space plot		Not required
	When disposable dishware such as take-out (limited to non-plastic materials) is used		Not required
	When disposable dishware designated by the Association cannot be used for takeout, etc.		Submitted monthly
Cutlery and chopsticks, etc.	When reused cutlery and chopsticks cannot be used in sales space plot	Submission	Submitted monthly
	When using disposable cutlery (limited to non-plastic materials) for takeout, etc.		Not required
	When disposable cutlery designated by the Association cannot be used for takeout, etc.		Submitted monthly
	When disposable chopsticks which made in Japan cannot be used for takeout, etc.		Not required
	When using disposable wet towels that do not contain petroleum-derived ingredients, or when using packaging materials with a biomass content of 50% or more		Not required

２） Food Measures

Regarding food loss and waste as indicated by the government, the basic policy of the Food Recycling Law announced in March 2025 raised the reduction target for food loss and waste in the entire supply chain to 60% of the FY 2000 level (5.47 million tons) by FY 2030, and the target for the recycling rate for food retailers to 65%. In order to set an even higher target for food waste reduction, Expo 2025 Osaka, Kansai, Japan will visualize data on the amount of food waste generated at stores, in addition to the food waste reduction measures that are generally implemented at stores, and encourage food and beverage companies to improve their food waste reduction measures on a daily basis to reduce the amount of waste generated during the exhibition. In addition, we will request the submission of materials related to food waste reduction, and will work to ensure that the food waste reduction measures implemented will remain as a record even after the exhibition.

In addition, the government will aim to achieve the target for the recycling rate of 100% by recycling food waste even after implementing the above food waste reduction measures by composting, etc.

(Food waste reduction measures)

- Control and devise procurement methods and procurement quantities to reduce waste and procure ingredients.
- Provide portions and sizes that can be easily eaten.
- Encourage visitors to order portions and sizes that can be easily eaten.
- Consider introducing methods such as nudging to avoid leftovers.
- Efforts will be made to reduce food waste, such as by utilizing a system (prepared by the Exposition AssociationExpo Association) that allows those who wish to purchase unsold lunch boxes.
- Participants will consider donating food items, which are guaranteed to be of high quality and have a long shelf life, to food banks. In addition, the Exposition AssociationExpo Association will consider providing information for donation.
- Efforts will be made to reduce food waste by referring to examples of measures to reduce food waste provided Expo Associationon the Association's official website. (Including meals for parties planned by participants and meals for staff arranged at events and in Pavilions).
- Specific measures to reduce food waste that stores will take will be described in the form specified by the Exposition AssociationExpo Association and submitted before the exhibition.
- Efforts will be made to reduce food waste by taking the above measures during the exhibition.
- Efforts will be made to submit and use necessary data when the Exposition AssociationExpo Association publishes data on the amount of food waste generated during the exhibition.
- Efforts will be made daily to further reduce food waste by referring to the actual amount of food waste generated during the exhibition.
- Efforts will be made to cooperate with the questionnaire about measures to reduce food waste conducted by the Exposition AssociationExpo Association around the end of the exhibition.
- The Exposition Association will publish the above submitted materials and data on the Association's official website and reports to be prepared after the exhibition.

(Recycling of food waste)

- Food waste that has been discharged despite measures to reduce food waste will be recycled by biogasizing it at the Japan Pavilion and the Carbon Recycling Factory in the Expo site, composting it at the composting machine in the Expo site, and composting it at the Compost facilities outside the Expo site.

3)Other waste measures

(Handouts such as novelties)

- Regarding novelties to be distributed at each Pavilions, consideration should be given to making them with less environmental impact. Even when actual goods are distributed, consideration should be given to (1) reducing the use of plastic, (2) making them environmentally friendly, such as those derived from biomass, even if plastic is used, and (3) not being disposed of immediately. Also, (4) devising distribution methods such as asking visitors whether they need them.
- Efforts should be made to minimize the use of bags when distributing materials, novelties, and souvenirs. Eco-friendly bags or paper bags should be used when distributing goods in bags.
- As for fans distributed free of charge, it is prohibited to use plastic materials or paper materials without patterns (When distributing, it should be made of wood, bamboo, etc., and should be durable and usable for a long time.).
- It is prohibited to distribute novelties that may be scattered inside and outside the Expo site.
- Maps, flyers, leaflets and pamphlets will be distributed electronically as much as possible to reduce paper emissions.

(Other)

- In order to make it easier for visitors from overseas to understand, pictograms will be posted in garbage bins and sorting guides will be assigned to ensure thorough separation of resources and garbage.
- While taking safety into consideration, do not use umbrella bags and consider installing water-drop removers.
- For beverages, seasonings, detergents, etc., paper packs and refills will be actively used to reduce the use of plastics.
- Regardless of the materials used, the use of disposable items will be considered to reduce.
- Balloons and balloons will not be used in outdoor displays within the venue, and inflated balloons will not be sold.
- The Exposition Association and its participants will make efforts to reduce the use of paper (Two-sided, consolidated printing, use of online meetings, etc.) at each facilities office.
- The Exposition Association and its participants will make efforts to reuse discarded furniture and equipment.
- Use up-cyclable and recyclable materials as much as possible for venue decoration.
- We recommend reusable transportation equipment (returnable boxes, etc.) for delivery of goods.

- The uniforms prepared by the Exposition AssociationExpo Association should be considered for sustainability, and Pavilions exhibitors should also be asked to consider sustainability in their uniforms.
- With regard to the 3R and circular economy initiatives, we will consider introducing the excellent participants on the Association's official website and awarding them during the exhibition.
- We will consider materializing the behavior styles expected of visitors (Bring own water bottles and own bag, separate garbage thoroughly, decline to use plastic amenities at the hotel facilities, etc.) and disseminating them to visitors.
- In Expo 2025 Osaka, Kansai, Japan, which is a testing ground for future societies, we will implement the recycling of difficult-to-recycle waste paper, horizontal recycling of Plastic bottles, and treatment of biodegradable plastics together with food waste as initiatives expected to be implemented in society, and disseminate information widely to society.

4. Waste in equipments, facilities from the Construction Stage to the Post-Exhibition Period

(1) Emission Estimation

The amount of waste generated during construction and demolition work was estimated based on the business plan and construction plan, as described in Expo 2025 Osaka, Kansai, Japan Environmental Impact Statement. The amount of waste generated during construction work (pre-exhibition) was calculated by multiplying facilities area of the planned venue by the basic unit of steel construction (basic unit of construction waste generated per total area) reported in the "Fiscal 2016 data on mixed building waste" (Japan Federation of Construction Contractors). In the estimation of waste discharge in the demolition work (after the session), it was calculated for each type from materials of facilities planned in the basic design document of Expo 2025 Osaka, Kansai, Japan. The amount of residual soil and sludge generated in the construction and demolition work was estimated based on the construction plan, etc.

In the estimation of residual soil, the amount of generated soil was calculated based on the plan of excavation to improve root cutting and floating foundation for facilities building in the venue improvement.

In the estimation of sludge, the amount of sludge generated was calculated from the estimated area of facilities, because pile foundation construction with sludge generation might be carried out in some parts of facilities, though the pile foundation in the construction work is assumed to be without drainage in principle. In the demolition work, the amount of sludge generated in the removal of steel pipe piles was calculated.

The recycling rate of sludge was set based on the recycling and reduction rate of construction sludge in the Construction Recycling Promotion Plan 2020.

Table II-5 Estimated amount of waste generated by construction work (scheduled site)

Type of waste	Amount generated [t]	Composition ratio [%]	Recycling [%]	Recycling ratio [t]	Disposal [t]
Waste plastics	1,064	7.1	59.0	628	436
scrap metal	600	4.0	96.0	576	24
Glass waste, ceramics waste, plasterboard	2,148	14.2	79.3	1,703	445
Paper waste, wood waste, other	2,702	17.9	76.6	2,069	633
Debris	5,452	36.2	99.3	5,415	37
Mixed waste	3,100	20.6	63.2	1,959	1,141
Total	**15,067**	**100.0**	**82.0**	**12,351**	**2,716**

Note:Figures may not be correct due to rounding.

Table II-6 Estimated amount of waste generated from demolition work (scheduled site)

Type of waste	Amount generated [t]	Composition ratio [%]	Recycling rate [%]	Amount recycled [t]	Disposal [t]
Waste plastics	1,688	0.2	59.0	996	692
Metal scrap	56,318	7.4	96.0	54,065	2,253
Wood scrap	17,397	2.3	97.0	16,875	522
Debris	669,929	87.4	99.5	666,580	3,350
Mixed waste	20,774	2.7	63.2	13,129	7,645
Total	**766,106**	**100.0**	**98.1**	**751,644**	**14,462**

Note:Figures may not be correct due to rounding, etc.

Table II-7 Estimated amount of soil remaining from construction work

Amount generated	Soil used			Amount of soil remaining
	Amount of backfill [m3]	Amount of preparation and filling [m3]	Total	
1,091,000	50,000	1,042,000	1,091,000	0

Note:Figures may not be correct due to rounding.

Table II-8 Estimated sludge from construction work (scheduled site)

Type of waste	Amount generated [t]	Recycling rate [%]	Recycling rate [t]	Disposal [t]
Sludge	6,600	95.0	6,270	330

Table II-9 Estimated sludge from demolition work (scheduled site)

Type of waste	Amount generated [t]	Recycling rate [%]	Amount recycled [t]	Amount of disposal [t]
Sludge	780	95.0	741	39

（2） Reuse initiatives at equipments, facilities

In equipments, facilities, priority will be given to reduce and reuse to reduce the amount of waste resulting from the dismantling of equipments, facilities. In addition to the active use of leases, efforts will be made based on a mechanism for reuse. Specifically, the following efforts will be made to actively promote reuse in Expo 2025 Osaka, Kansai, Japan and to make this mechanism useful for the promotion of reuse in facilities and equipments in Japan.

First, the objects to be reused will be classified into the following 3 categories, and the recipients will be selected through public solicitation, and the removal, packing, storage, and delivery of equipments, etc. will be carried out after the end of the exhibition.

PHASE 1: facilities that does not use leased building materials

PHASE 2: large roof ring wood, building materials from facilities that are not subject to relocation, Equipments, equipments, etc.

PHASE 3: fixtures, equipments, etc. remaining at the end of the exhibition

In February 2024, in order to grasp the demand for large roof ring wood, we invited proposals for reuse, etc., and since then, we have received proposals continuously. As of November 2024, we received proposals from about 30 people, and they are used as reference information for future ring demolition work.

In July 2024, we launched a reuse matching business with the cooperation of 10 companies who are highly conscious of promoting the circular economy, and in August, we launched the website of Expo Circular Market Myak City! website. Building materials matching platforms are operated mainly in the EU and the United States, and we aim to establish similar efforts in Japan. Subcommittees on reuse, transportation and storage, and systems have been formed, and studies on packaging and storage of equipments and other materials removed from equipments and other materials, assuming reuse, and development of a Web system for public applications are being carried out.

Currently, a total of 22 facilities buildings, including 3 Signature Pavilions that do not use leased building materials and 15 facilities buildings by young architects, and large roof rings are eligible for reuse in facilities. The basic information is published on the Myak City! website, and we are preparing for public applications, and we are accepting inquiries about considering reuse. We have received inquiries from more than 100 people, including the above-mentioned consideration of using ring wood.

From the end of FY 2024 to the first half of FY 2025, public applications for reuse (PHASE 2) of facilities, including large roof rings, building materials from facilities that are not subject to relocation, and Equipments,

equipments will be held, followed by public applications for furniture and fixtures (PHASE 3). Official and unofficial participants will be invited to participate in the reuse matching service, and Myak City! will be enhanced.

Figure II-1 Myaku-Ichi ! Service site

（３） facilities equipments targets for reuse

(2)As for the reuse of facilities equipments, which will be carried out based on the above, it will be divided into two categories: the reuse of the building itself and the reuse of equipments, which will be set immediately before the exhibition.

As for the former, Lease facilities will be actively used and the reuse of facilities will be promoted. As for the reuse of facilities in facilities, the amount of demand cannot be estimated at present, and the total amount is only a rough estimate, so the target will be examined as an absolute amount. In this case, the reuse status of past World Expos (registered expos) in Japan will be used as an index. At the 1970 Osaka Expo, 28 of the 56 international pavilions and 30 corporate pavilions in Pavilions were partially or wholly reused in facilities. The Cambodian pavilions and the Munich city pavilions are still used as housing complexes and facilities of the Self-Defense Forces. Records of the 28 Pavilions pavilions are scarce and it is difficult to conduct a survey. However, the results of the survey show that 7 pavilions were completely relocated, 5 were partially relocated, and 16 were not known for their relocation ratio. At the 2005 Aichi Expo, 19 foreign pavilions and 6 domestic pavilions were reportedly reused out of about 100 large and small facilities pavilions.

Based on 1970, which was the year when there were many cases of relocation, the goal for the time being is to at least surpass 1970. In this case, if the relocation ratio is unknown, it is basically considered that if the ratio is large, it is likely to be recorded, and it is basically counted as partial relocation. The target value is set at about 50%, and 21 partially relocated buildings are regarded as 10.5 buildings, and the target value is 17.5 buildings including the whole relocation.

（４） Target for recycling

The recycling rate has also been set as shown in Table II-10, following Expo 2025 Osaka, Kansai, Japan Environmental Impact Statement.

Table II-10 Target for recycling rate

Type	Recycling rate [%]	Source/Reference
Concrete mass	99.3	Construction Recycling Promotion Plan 2020 (the Ministry of Land, Infrastructure, Transport and Tourism)
Ascon block	99.5	
Wood waste	97.0	
Mixed waste	63.2	
Glass ceramics	73.0	Report on the Status of Industrial Waste Discharge and Treatment FY 2019 Results (the Ministry of the Environment)
Waste plastics	59.0	
Metal waste	96.0	
Waste	77.0	
Gypsum board	86.0	Recycling in the Construction Industry _ Recycling of Gypsum Board (Japan Federation of Architects Associations)
Others	63.2	Same as mixed waste

（５） Specific initiatives

In the construction of Pavilions, the following standards for resource recycling are presented in Design Guidelines for Type A (Self-Built) Pavilions, page 12 "2-4-3. Promotion of Resource Recycling and 3Rs," and construction is proceeding based on these standards.

2-4-3.Promotion of Resource Recycling and 3 R's
C-24 Two or more items of recycled materials must be used in building materials.
·As for building materials, the use of recycled materials should be actively considered for the main parts of structural strength.
C-25 Building structures and construction methods that are easy to separate during demolition must be adopted.
·Most of the building frame materials, roofing materials, exterior walls, and interior materials must be detachable or composed of a single type of material, and the structure and construction methods must be such that they can be recycled at least.
C-26 Water-saving sanitary appliances must be adopted. In addition to installing water-saving tops in the main faucets, water-saving Equipments must be adopted.
·When adopting water-saving Equipments, consideration should be given to products adopted with reference to whether they are certified with environmental labels.
G-21 It is desirable to actively reuse equipments and buildings.
·Designs should be made based on the assumption that they will be reused after removal.
·Initiatives should also be made to actively reuse interior materials, etc., which tend to be mixed waste.
·A wide range of possibilities should be examined, including not only equipments but also buildings.
It is desirable to design the trees used for the G-22 site and the plants used for rooftop and wall greening based on the assumption that they will be transplanted or relocated.

G-23 It is desirable to actively use renewable materials in nature, such as wood, paper, and soil. In particular, in the use of wood, wood with consideration for sustainability, such as certified wood, should be adopted.
·Expo 2025 Osaka, Kansai, Japan's sustainability standards, which will be formulated in the future, will be announced later.
G-24 Efforts should be made to avoid the use of materials with high environmental impact and materials that are recalcitrant.
G-25 Lease and rental materials should be used. A wide range of leasing and rental possibilities, including not only materials and equipment but also buildings, should be examined.
G-26 Rainwater should be actively used.
·Consideration should be given to storing rain on roofs and using it for irrigation and irrigation.

III. Natural Environment

1. Background of Natural Environment Initiatives

With regard to ecosystems and biodiversity, our country has led and promoted international efforts toward the conservation and sustainable use of biodiversity, including holding the 10 Conference of the Parties to the Convention on Biological Diversity (COP10) in Japan in 2010.

At COP10, the Aichi Biodiversity Targets and the Nagoya Protocol on Opportunities to Acquire Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization (ABS) were adopted as global targets for achieving the objectives of the Convention. On the other hand, according to the Global Biodiversity Outlook, Version 5 (Global Biodiversity Outlook 5, GBO5), published in September 2020, the achievement of the Aichi Biodiversity Targets was assessed as having made considerable progress in most of the targets, but none of the 20 individual targets had been fully achieved. It was pointed out that achieving the 2050 vision, “Coexistence with Nature, ” requires coordination of actions in various fields, such as expanding efforts to conserve and restore biodiversity to all levels, combating climate change, responding to the causes of biodiversity loss, changing production and consumption patterns, and trading in sustainable goods and services, rather than individual responses.

Accordingly, at the 15 Conference of the Parties to the Convention on Biological Diversity (COP15) held in December 2022, the Kunming-Montreal Biodiversity Global Framework was adopted as a new international target (the Post- 2020 Biodiversity Framework) for 2021 and beyond, replacing the Aichi Biodiversity Targets that had been the international targets until 2020. In this framework, one of the main targets was 30by30, which aims to effectively conserve 30% of land and sea as healthy ecosystems by 2030, with the goal of halting and reversing biodiversity loss by 2030. In addition, the framework adopted targets such as mainstreaming biodiversity into business.

With regard to marine environmental conservation, the Group of 20 Osaka Summit was held in 2019, and the leaders of the Group of 20 shared the Osaka Blue Ocean Vision, which aims to achieve 0 additional pollution from marine plastic waste by 2050. Marine plastic waste discharged into the ocean due to improper management, etc. is causing various problems such as deterioration of the marine environment including ecosystems, deterioration of coastal functions, adverse effects on landscapes, impediments to ship navigation, and impacts on fisheries and tourism. The amount of marine plastic waste is extremely large, and it is reported that approximately 8 million tons of plastic waste are discharged into the ocean worldwide every year. At this rate, it is estimated that the weight of marine plastic waste will exceed the weight of fish by 2050. The issue of marine plastic waste needs to be addressed as a global issue. Osaka Prefecture and Osaka City, the hosts of Expo 2025 Osaka, Kansai, Japan, are taking the lead in reducing marine plastic waste in partnership with a wide range of stakeholders.

Furthermore, in an October 2009 report by the United Nations Environment Programme (UNEP), carbon captured in marine ecosystems such as seagrass beds and tidal flats was named "blue carbon" and presented as a

new option for sink measures. In our country, seaweed beds, seaweed beds, tidal marshes and tidal flats, and mangrove forests are listed as marine ecosystems that sequester and store blue carbon, and these are called "blue carbon ecosystems." In January 2022, Osaka Prefecture announced the "Osaka Prefecture Marine Blue Carbon Ecosystem Vision," which states that in the southern waters of the bay, the creation and conservation of seagrass beds that contribute not only to the accumulation of blue carbon but also to the spawning of aquatic organisms and the growth of young and young fish will be promoted. Furthermore, in January 2024, the "Osaka Bay Blue Carbon Ecosystem Alliance (BA)" was established with Hyogo Prefecture to accelerate the conservation, regeneration, and creation of seagrass beds and other marine ecosystems in order to realize the "Osaka Bay BA Link Initiative" that surrounds the coast of Osaka Bay with seagrass beds and other marine ecosystems.

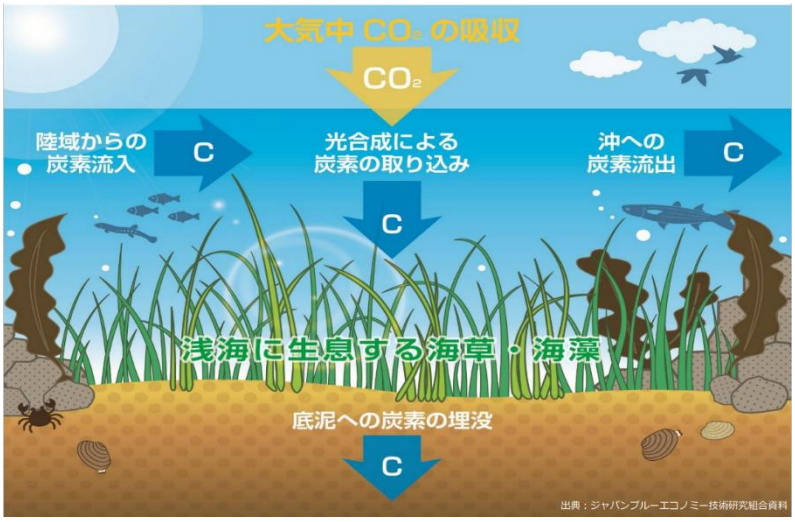


Figure III-1 Mechanism of blue carbon (Source: the Ministry of Land, Infrastructure, Transport and Tourism website)

(https://www.mlit.go.jp/kowan/content/001394943.pdf)

In the economic field, the Task Force on Nature-related Financial Disclosure (Taskforce on Nature-related Financial Disclosure, TNFD), a framework for reporting and responding to nature-related risks, was launched with the aim of establishing a framework for reporting and responding to nature-related risks, which was conceived at the World Economic Forum's annual meeting in Davos in 2019, and shifting the global flow of funds from negative impacts on nature to positive impacts on nature.The TNFD will address not only how nature can affect organizations, but also how organizations can affect nature. In September 2023, the TNFD published its final recommendations, version 1.0, which newly set forth the concept of identifying, evaluating, prioritizing and disclosing nature-related dependencies, impacts, risks and opportunities throughout the value chain (LEAP). In addition, with regard to systems in the value chain where water, biodiversity, land, and oceans are interrelated, the development of methods for setting scientifically based, measurable, and actionable targets (Science Based Targets for Nature, SBTs for Nature) is under way to enable companies to act within the limits of the earth and in line with

the sustainability goals of society.

２． Specific Efforts

For the implementation of Expo 2025 Osaka, Kansai, Japan, an environmental impact assessment (environmental assessment) based on the Osaka City Environmental Impact Assessment Ordinance was conducted, and an environmental impact assessment report was submitted to Osaka City in June 2022. The project will be implemented appropriately based on the environmental impact assessment report.

(Specific Efforts)

(1)Under Construction

General Considerations

- Preventing construction workers from entering the area outside the construction zone.
- As far as possible, low-noise and low-vibration construction machines should be used as a source of noise and vibration.
- In the case of nighttime construction, the construction work should be kept to a minimum, and the effects on flora and fauna living outside the planned site of the Expo site and the planned site of the Maishima Expo P & R parking lot should be reduced as much as possible by adopting an appropriate light-shielding hood and arranging lighting fixtures appropriately.

- Consideration for animals (birds)

- In the area near the inner water surface of Yumeshima Island Ward 1, the government will consider measures such as mowing grass in coordination with Osaka City and other organizations so that birds using bare land can use the area.
- When the arrival of common terns is confirmed, the government will take measures to prevent nesting such as covering the area with bird-proof nets in accordance with the "Guidelines for Conservation and Consideration of Breeding Areas for Common Terns." In addition, if nesting is confirmed, consideration and measures will be taken, such as banning the area from entering in principle.
- The sedimentation pond in the southern part of the planned site is not scheduled for ground improvement work, and it is considered that birds can use it as a shallow area or a place to rest their wings. In addition, in the southeastern part of the planned site, the government will consider that part of the sediment moved by the construction work will be returned to an appropriate place in cooperation with Osaka City, and the water level will be restored so that birds using the waterside will be able to use the area.

○ Consideration for Animals (Mammals)

- In the construction of the planned site for the Maishima Expo P & R Parking Lot, in order to move the kaya-mice to a place where they can live in the vicinity of the planned site, the mowing will be carried out before the start of the construction work, moving them from the center of the grassland to the surrounding area, and the work will be carried out in several stages.

○ Consideration for Plants

- Before the start of the construction work, the growth status of important species of plants will be confirmed. If the growth status is confirmed, appropriate measures will be taken based on the opinions of experts.

○ Confirmation of the implementation status of conservation measures

- Every month from April to July of each year during the construction period, the status of birds flying in and around the proposed site will be checked.

(2)When the site is in service

- General considerations
  - For air conditioning equipments, etc., equipments of low noise type and low vibration type shall be adopted as much as possible, and appropriate maintenance and management shall be carried out.
  - The effect on the flora and fauna living and growing outside the site of the site and the site of the Maishima Expo P & R Parking Lot shall be reduced as much as possible through the adoption of appropriate shading hoods and proper placement of lighting fixtures.
- Consideration for animals (birds)
  - Consideration will be given to ensuring green spaces in the site so that animals can use them.
  - Consideration will be given to ensuring that the area near the inner water surface of Yumeshima Island Ward 1 can be used by birds using bare ground by implementing measures such as mowing grass in coordination with Osaka City and others.
  - An open water surface will be secured in the site as much as possible in consideration of birds living near water. In addition, consideration will be given to ensuring that the southeast area of the site can be used by birds using water by restoring the water level by returning some of the sediment moved by the construction to an appropriate place in cooperation with Osaka City.
- Confirmation of implementation of conservation measures
  - Once every month from April to July during the exhibition period, the government will check the status of birds flying in and around the proposed site.

The "Sustainability-Friendly Procurement Code" formulated and published in June 2022 establishes sustainability-friendly procurement standards, including biodiversity conservation, for suppliers, licensees, Pavilions operators, and their supply chains. The procurement standards stipulate that raw materials derived from endangered species of wild fauna and flora for which measures for sustainable use, such as resource conservation and reproduction, have not been taken. It also stipulates that suppliers, etc. should work to reduce the burden on biodiversity and ecosystems by preserving endangered species of wild fauna and flora and by producing them using methods that have little impact on organisms and their habitats, in the production and distribution of procured products, including the collection and cultivation of raw materials.

Since important species of birds, such as shorebirds, plovers, and common terns, fly to the planned site in Expo 2025 Osaka, Kansai, Japan, the environmental impact assessment conducted by Expo Association also stipulates that efforts will be made to consider bird habitats as much as possible. Nature conservation organizations and other NGOs have requested the creation of a forum for discussion with NGOs, based on the idea that they can make use of the activities and other efforts they have undertaken in various regions in relation to conservation and consideration of important species. In addition, in order to realize Expo 2025 Osaka, Kansai, Japan's theme "Designing Future Society for Our Lives" and Theme Week, one of which is "The Future of the Earth and Biodiversity," a joint study on conservation and consideration of bird habitats conducted by Expo Association has been held at the request of NGOs from the viewpoint of cooperation with NGOs and stakeholder engagement.

The first joint study was held in September 2023 and the second in February 2024. Expo Association explained the results of the post-survey on birds based on the post-survey plan, conservation and consideration of birds (Shorebirds, Common Terns, etc.), and exchanged opinions.

In the center of the Expo site, the "Serenity Forest" is maintained as an exceptionally quiet and relaxing place. As for the trees to be planted, the forest will be constructed by transplanting trees that will be thinned in the future from parks in Osaka Prefecture, including Expo Memorial Park.

Osaka Prefecture and Hyogo Prefecture are promoting the "Osaka Bay MOBA Link Initiative" to realize the creation of seagrass beds to provide habitats, egg-laying sites, and nurseries for aquatic organisms such as fish and shellfish, and at the same time to increase the amount of carbon dioxide absorbed. In cooperation with the project, biodiversity conservation and nature positivity will be communicated.

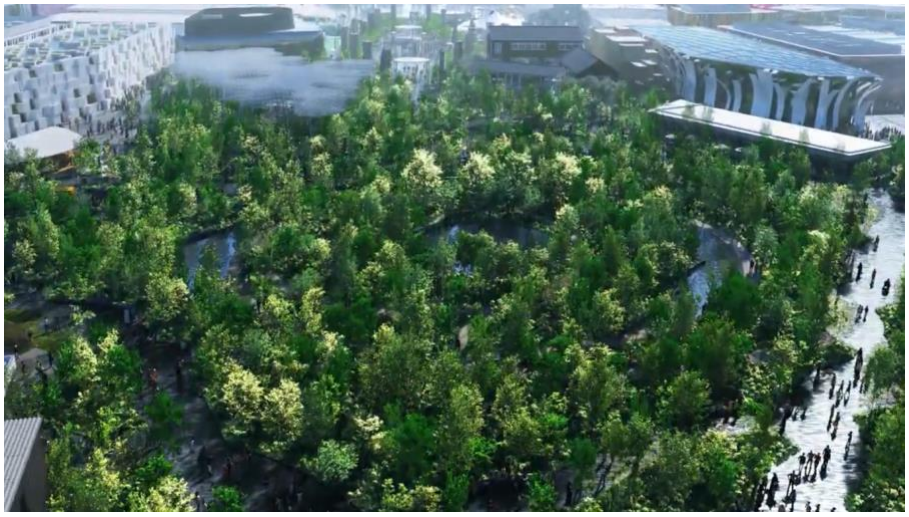


Figure III -2: Serenity Forest Image

IV Cross-Sectional Issues

1． Efforts for young people and children (Junior SDGs Camp)

In order to maximize the effect of education for young people and children at the Expo, we consulted with educational experts and teachers of elementary, middle, and high schools from FY 2023. As a result, we decided to focus on (1) experiential programs, (2) tours of the venue, and (3) web content exhibitions in the following three areas, and to conduct the "Junior SDGs Camp" at the Sustana Dome on the west side of the venue.

Figure IV-1 Junior SDGs Camp Venue

(1)Experiential Programs

A place for input and output using the five senses, which can be felt only in a real venue , will remain in the minds of visitors and lead to continuous behavior change.

Experiential programs on environmental issues and SDGs produced by Expo Association, companies, NPOs, and university seminars will be implemented, and part of the programs will have elements of international exchange. At this time, programs conducted by SMEs, NPOs, and university students will be actively accepted.

In addition, the program aims to create opportunities to not only input information on each theme, but also to discover issues in one's own life, consider solutions, and lead to changes in one's daily behavior and consciousness.

[Programs under consideration]

- Discuss Environmental Issues with People Abroad (Indonesia Edition)
- Discuss Environmental Issues with People Abroad (Switzerland Edition)
- Discuss Environmental Issues with Children Abroad (Kiribati Edition)
- Think about Environmental Issues and SDGs through Styrofoam
- Learn about waste and environmental issues with the waste sorting board game "Hokasu"!
- Can it be used at food stalls? Learn about reusable dishware
- Plastic bottles return as plastic bottles?
- Concrete that absorbs carbon dioxide?

(2)Tour inside the venue

A guide map was created to show the highlights of Pavilions and facilities in the venue, as well as SDG-related content, and based on the map, a tour inside the venue will be conducted.

Figure IV-2 Venue Tour Guide map (image)

(3)Web Content Exhibition

Web content related to the environment and SDGs will be exhibited inside the venue.

[Example of Web content exhibition]

- SDGs educational content (For Elementary School Students, Middle and High School Students): Provides knowledge about the SDGs and serves as an opportunity to deepen understanding of the SDGs
- SNS-linked content: Provides a place to output what we have learned about the SDGs through the Expo and serves as an opportunity to think about them as our own
- Hands-on program materials
- Tour guide map of the venue
- Environmental initiatives implemented at the venue
- Videos and other materials on the "Future Society Showcase Project"
- Children's Declaration of SDGs: Children's SDGs initiatives in their daily lives, learning through experiential programs, and their own ideas gained through exchanges are input and disseminated as output in the form of a declaration.

In fiscal 2024, workshops were held with experts, elementary, junior high, and high school teachers, and students on the above issues to flesh out the individual content, and to create teaching materials and educate staff.

２． Others (collaboration with companies, etc.)

(1)Co-Design Challenge Program

The Co-Design Challenge Program is a project to realize new products at the Expo by co-creating with various players, taking the opportunity of Expo 2025 Osaka, Kansai, Japan to rethink various ways of "creating the future of Japan's lifestyle." At present, the projects selected through public solicitation are progressing steadily, and the efforts are introduced on the Association's official website, etc., and information will be disseminated continuously.

This program embodies Expo 2025 Osaka, Kansai, Japan's concept of "People's Living Lab." In addition, by making participation of SMEs conditional, not only large companies but also SMEs, including start-ups, aim to solve current social issues by developing new goods and services. The products and services created through the co-

creation of various players will be implemented inside and outside the Expo venue and disseminated to the world. It is expected that new goods and services contributing to decarbonization and resource recycling will be created from the projects selected for this program. In addition to the development of goods, the second program requires the participants to engage in a manufacturing experience project (open factory) that includes a tour of the manufacturing site related to the goods. This is expected to attract mutual visitors between the Expo venue and the local community.

Figure IV-3 Co-Design Challenge Program Process

Here, examples of selected projects in the first program (Co-Design Challenge 2023) are introduced. The (Representative companies and organizations: Terracycle Japan GK/Cooperating companies and organizations: AEON Co., Ltd., P & G Japan GK) production project has been launched as the EXPO 2025 Minna no Recycling Station Project.

Figure IV-4 “Design the Future of Recycling Boxes ” production project

This project collects used plastic containers for daily use at 650 Aeon Group stores nationwide. The collected used plastic containers are sorted, processed, and recycled into raw materials to produce recycling bins to be installed at the Expo site.

Next, examples of selected projects in the second project (Co-Design Challenge 2024) are introduced. In the "A "display stand" made from waste paper, which is lightweight and strong and can be designed in a variety of designs"

production project (Representative companies and organizations: Sustainable Generation/Cooperating companies and organizations: Akram Co., Ltd., Takagi Packaging Co., Ltd., Pack Inter Kagi Co., Ltd.), we are challenging the development of a display stand made from recycled paper that retains the lightness of recyclable corrugated cardboard and ensures durability through design. The project is not disposable, is easy to carry and store, and can be recycled and returned to corrugated cardboard in the end. As for experience projects, which are unique to the second project, we are planning to conduct a tour of a corrugated cardboard case manufacturing factory, experience making a craft kit using corrugated cardboard scraps, and experience the DAN sumo tournament, which is associated with the history and culture of the birthplace of sumo wrestling.

(2)Expo 2025 Official Experiential Travel Guides

In April 2024, the Exposition AssociationExpo Association opened a portal site called "Expo2025 Official Experiential Travel Guides" in order to lure tourists outside the venue, taking advantage of Expo 2025 Osaka, Kansai, Japan event. On the portal site, high value-added travel products that have a affinity with the theme of Expo 2025 Osaka, Kansai, Japan and can provide high satisfaction will be posted, and local tourism information and product information will be delivered directly to expo visitors. In addition to searching and booking by date and place, users can also search from a number of genres related to the theme of Expo 2025 "Designing Future Society for Our Lives". They can experience the theme of Expo through the introduction of travel products and local event information related to the theme of Expo 2025 in each region.

(3)Theme Week

Theme Week is an initiative that takes advantage of the characteristics of Expo 2025, in which countries from all over the world gather at the same place for a period of six months, with the aim of bringing together wisdom to solve global issues, exploring solutions through dialogue, and creating a brighter future society together with the world. Each week, a different global issue is set as a theme, and not only the organizers, but also official participants, the Japanese government and local governments, co-creation projects, Expo participants such as exhibitors, and local governments and industry from all over the country gather to discuss solutions, and "Business Exchange" for concrete actions.

With regard to environmental issues, the following events will be held: "Global Dreams and Biodiversity" from September 17, 2025 to 28, which will address climate change and resource recycling in general; "Future Communities and Mobility" from May 15 to 26, which will address transportation; and "The Future of Food and Lifestyle" from June 5 to 16, which will address issues such as food loss.

In addition, Theme Week Connect, an initiative to solve global issues related to the "Eight Themes" of Theme Week, will be held outside the Expo venue. As an off-site related program of Theme Week, participation is not limited to the Osaka and Kansai areas, but is also possible from all over the country. By linking with initiatives to solve global issues nationwide, with Expo 2025 Osaka, Kansai, Japan as a focal point, we will build momentum nationwide.

Green Vision Review (Attachment 1)

The Green Vision is being discussed by the following working groups.

1． Decarbonization section

(1)Decarbonization working group

In order to achieve "realization of carbon neutrality" as stated in the EXPO 2025 Green Vision and the direction to be aimed, CFP calculation, examination of power composition, technologies described in the Green Vision and Action Plan, and concept of offset are discussed.

(Status of meeting)

1st Decarbonization working group (July 28, 2022)

・Positioning of the Decarbonization working group, purpose of establishment, agenda for discussion, and confirmation of schedule

・2025 Expo 2025 Osaka, Kansai, Japan Action Plan Version 2

・Use of electricity gas during the session

・Basic direction of energy policy

・Hydrogen power generation

・Ammonia Power Generation

・Demonstration of Methanation Using Renewable Energy Hydrogen

2nd Decarbonization Working Group (October 4, 2022)

・Efforts to Reduce Greenhouse Gases by Promoting Behavior Change Inside and Outside the Venue

・Energy Management during the Session

3rd Decarbonization Working Group (December 6, 2022)

・Concept of GHG Emissions Calculation (Boundaries, Calculation Conditions, etc.)

4th Decarbonization Working Group (February 1, 2023)

・Carbon Neutral LPG and Aircraft Offset

・Introduction of World Cup Boundaries, Emissions Calculation, etc.

・Revised EXPO 2025 Green Vision (Decarbonization section: draft)

5th Decarbonization Working Group (August 10, 2023)

・From the Secretariat

Current status and schedule for this fiscal year

Future Society Showcase Project Supporter Press Conference (7/20, 8/2)

・Energy Management at the Expo

・ESD and Environmental Education at the Expo

6th Decarbonization Working Group (November 21, 2023)

・Expo 2025 Osaka, Kansai, Japan's Latest Preparation Status

・EXPO Green Challenge

・Revision of Greenhouse Gas Emissions Estimates and Future Prospects

・Energy Management at the Expo

・Other Progress Reports

Progress of Overseas Pavilions

ESD triggered by the Expo

Tourism attraction triggered by the Expo

7th Decarbonization Working Group (February 9, 2024)

・Expo 2025 Osaka, Kansai, Japan's latest preparations

・Examples of other international events

・Proposal to revise the Green Vision (2024 version) for EXPO2025

・Status of ESD discussions triggered by the Expo

8th Decarbonization Working Group (September 24, 2024)

・Latest status of preparations for the Expo

・ESD triggered by the Expo

・Building momentum for green

・Calculation of GHG emissions and implementation of third-party verification

・Current status of carbon recycling factories

9th Decarbonization Working Group (January 7, 2025)

・Green launch, etc.

・Energy management and visualization

・Results of Third-Party Verification of GHG Emissions Calculation

・Revision of the Green Vision for EXPO 2025

List of members of the Decarbonization Working Group

Keigo Akimoto, Research Institute for Global Environment and Industrial Technology Group Leader Senior

Researcher

Yoshiyuki Shimoda, Professor, Department of Environmental and Energy Engineering, Graduate School of Engineering, Osaka University

Masato Nobutoki, Coordinator, SDGs Promotion Office, Academic Research Promotion Organization, Kobe University

Professor Director, X Urban Research Institute, Inc.

Mari Yoshitaka, Fellow, Mitsubishi UFJ Research & Consulting Co., Ltd.

T) Visiting Professor, College of Liberal Arts, The University of Tokyo

２． Resource circulation and circular economy section

(1)Resource circulation study meeting

A resource circulation study meeting was held under the auspices of the Sustainability Expert Committee in order to materialize and implement the measures described in the revised "EXPO 2025 Green Vision" announced in April 2022 as measures for realizing sustainable preparation and management of Expo 2025 Osaka, Kansai, Japan.

(Status)

1st resource circulation study meeting (August 9, 2022)

・Explanation of the direction (draft) related to resource circulation in the management of Expo 2025 Osaka, Kansai, Japan

・Hearings with business operators related to the direction (draft)

2nd resource circulation study meeting (September 27, 2022)

・Explanation of the direction (draft) version 2 for resource recycling in the management of Expo 2025 Osaka, Kansai, Japan

・Hearings with business operators regarding the direction (draft)

(2)Resource Recycling Working Group

With regard to resource recycling in the management of Expo 2025 Osaka, Kansai, Japan, the Resource Recycling Working Group was established in order to examine the revised draft of the Green Vision for EXPO 2025, its implementation, and measures to be implemented, based on the content of discussions at the Resource Recycling Study Group and the hearings conducted with business operators.

(Status of Meetings)

1st Resource Recycling Working Group (February 20, 2023)

・Explanation of the revised draft of the Green Vision for EXPO 2025

2nd Resource Recycling Working Group (November 7, 2023)

・Explanation of the status of discussions on resource recycling in Expo 2025 Osaka, Kansai, Japan

・Explanation of ESD (Education for Sustainable Development) triggered by Expo 2025 Osaka, Kansai, Japan

The 3rd Working Group on Resource Circulation (February 19, 2024)

・Explanation of Guidelines for Proper Disposal of Waste (Operating Period) (first edition)

・Explanation of ESD (Education for Sustainable Development) triggered by Expo 2025 Osaka, Kansai, Japan

・Explanation of the revised draft of the Green Vision for EXPO 2025

4th Working Group on Resource Circulation (December 4, 2024)

・Explanation of the revised draft of the Green Vision for EXPO 2025

(List of members of the Working Group on Resource Circulation)

Professor, Department of Basic Research, Institute for Global Environmental Studies, Institute for Human Culture, Misuzu Asari University

Professor, Social Solutions Initiative, Osaka University

Tomoko Okayama Professor, Faculty of Community Creation, Taisho University

Yuko Sakita, journalist and environmental counselor

Sadao Harada, Associate Professor, Faculty of Economics, Doshisha University

Glossary (Attachment 2)

3R+Renewable

The thorough implementation of the 3Rs (Reduce, reuse, and recycle) and the substitution of renewable resources.

BAU(Business-as-Usual)

If the status quo is maintained without taking additional measures. The course of events. It means the future emissions of greenhouse gases and waste if no measures are taken.

BECCS(Bio-Energy with Carbon Capture and Storage)

Technology for collecting and storing CO2 generated by combustion during the use of biomass energy.

CCUS(Carbon Dioxide Capture, Utilization and Storage)

Technology for collecting CO_2 emitted from power plants, chemical plants, etc., separated from other gases, and using the separated and stored CO_2.

DAC(Direct Air Capture)

Technology for separating and collecting CO_2 directly from the atmosphere.

DACCS (Direct Air Carbon Capture and Storage)

Technology for collecting and storing CO2 directly from the atmosphere.

ESD(Education for Sustainable Development)

Education for Sustainable Development. Learning and education activities aimed at realizing a sustainable society by proactively identifying the problems of modern society as one's own problems and working from a place close to home to ensure a rich life for future generations. These activities bring about changes in values and behaviors that lead to the solution of these problems, and aim to realize a sustainable society.

ESMS(Event Sustainability Management System)

A management system for event sustainability. It aims to improve event sustainability by managing the environmental, economic, and social impacts of event management. The 2012 London Olympic and Paralympic Games led to the publication of ISO20121 as an international standard.

EV(Electric Vehicle)

An electric vehicle. A motor powered by electricity.

FCV(Fuel Cell Vehicle)

A fuel cell vehicle. A motor powered by hydrogen and powered by electric energy generated by a chemical reaction between hydrogen and oxygen in a fuel cell.

Greenhouse Gas Protocol

The GHG Protocol is co-sponsored by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), and is operated in cooperation with governments, industry associations, NGOs, and companies. In the late 1990s, the development of corporate GHG emission calculation methods began. In 2001, the first edition of the Corporate Standard, which is a method for calculating Scope1 and Scope2 GHG emissions, was published. Since then, various standards related to the calculation and reporting of GHG emissions have been issued. Overseas government organizations and global companies have participated in the formulation of the standards, and they are establishing themselves as de facto standards.

GX(Green Transformation)

This is an effort to transform the entire economic and social system by shifting the industrial and social structure that has been centered on fossil energy since the Industrial Revolution to one centered on clean energy. It aims to create new demand and markets in the decarbonization field, strengthen industrial competitiveness, and realize economic growth.

JCM

This is a bilateral credit system implemented in accordance with Article 6 of our country Agreement. It credits the reduction and absorption of GHG emissions achieved through the dissemination of advanced decarbonization technologies and implementation of countermeasures in developing countries, and contributes to the reduction of emissions in Paris.

J-Credit

Credits certified under the J-Credit system, in which the government certifies the amount of CO2 emissions reduction through the introduction of energy-saving equipments and the use of renewable energy, and the amount of CO2 emissions absorbed through appropriate forest management.

SBTs for Nature(Science Based Targets for Nature)

Measurable and actionable targets based on scientific evidence that enable companies and others to act within the limits of the earth and in line with the sustainability goals of society with regard to the interconnected systems of water, biodiversity, land, and oceans in the value chain. Development of setting methods is underway.

Scope 1

Categories of GHG emissions defined by the GHG Protocol. Direct emissions of greenhouse gases by companies themselves (Fuel combustion, industrial processes).

Scope 2

Categories of GHG emissions defined by the GHG Protocol. Indirect emissions from the use of electricity, heat and steam supplied by other companies.

Scope 3

Category of GHG emissions defined by the GHG Protocol. Indirect emissions other than Scope 1 and Scope 2 (emissions from other companies related to business activities).

SDGs (Sustainable Development Goals)

International goals for a sustainable and better world by 2030. Consisting of 17 goals and 169 targets, the SDGs pledge to "leave no one behind" on the planet. The SDGs are universally addressed not only by developing countries but also by developed countries themselves, and Japan is actively working on them.

Taskforce on Climate-related Financial Disclosures(TCFD)

At the request of the Group of 20, the Task Force on Climate-related Financial Disclosure was established by the Financial Stability Board under the chairpersonship of Michael Bloomberg to consider how to conduct climate-related information disclosure and financial institutions' responses. The TCFD released its final report in June 2017, and companies are encouraged to disclose climate-related risks and opportunities.

Taskforce on Nature-related Financial Disclosures(TNFD)

The Task Force on Nature-related Financial Disclosure was conceived at the World Economic Forum's annual meeting in Davos in 2019. The Task Force is a framework for reporting and responding to nature-related risks with the aim of shifting global financial flows from negative impacts on nature to positive impacts on nature.

General Business Participant

A person referred to in Article 35 of General Regulations who has been granted the right by the Organizer to implement Commercial Activities in the Expo Site.

General Regulations

General Regulations included in Chapter 8 of the Registration Application approved at the 167 Annual Meeting of the BIE.

Ethical Consumption

Consumers make wise consumption decisions based on their own consideration for people, society and the environment.

Offset

"Carbon offset" refers to the concept of making up for the greenhouse gas emissions of the individual by purchasing carbon credits and other emissions reduction and absorption activities. However, under the GHG protocol, offsetting by carbon credits is not recognized as a reduction.

Carbon credits

The amount of greenhouse gas reductions and removals achieved through the introduction of renewable energy (such as solar power, wind power, and hydroelectric power), the introduction of energy-efficient Equipments, or forest management, such as afforestation and thinning, is quantified in accordance with a specified method and converted into a tradable form. Credits are managed as a unit of 1t-CO_2 in an electronic account. In Green Vision, this refers to J-Credit or JCM, which are highly reliable carbon credits.

Carbon Neutral

Balancing greenhouse gas emissions and removals. Reducing greenhouse gas emissions to zero by subtracting removals and removals from emissions of methane, N_2O, and chlorofluorocarbons (Hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, nitrogen trifluoride). The basic meaning of net zero is the same.

Carbon pricing

It is an economic method to change the behavior of emitters by assigning a price to carbon. There are various methods such as carbon taxes, which impose a tax in proportion to the amount of CO_2 emitted, emissions trading, which impose a cap on the amount of CO2 emitted, and fossil fuel taxes, which impose a tax in proportion to the amount of fossil fuels such as coal and oil.

Carbon recycling

A technology to recognize CO_2 as a carbon resource, recover it, and recycle it as various carbon compounds.

Guidelines

Guidelines for exhibitions issued by the organizers in relation to each item specified in Special Regulations to assist official participants in all matters related to the preparation and operation of exhibitions.

Clean Gas Certificate

Efforts to transfer to certificates the environmental value of gases such as e-methane and biogas that are deemed not to increase CO2 in the atmosphere when burned.

Green Ammonia

Ammonia made from hydrogen produced using renewable energy.

Green hydrogen

Hydrogen produced from renewable energy sources without CO_2 emissions in the production process.

Official Participants

Foreign governments and international organizations that have accepted the Japanese government's official invitation to participate in the exhibition.

Synthetic Fuel

Fuel produced by synthesizing CO_2 and hydrogen. A complex of multiple hydrocarbon compounds, also called "artificial crude oil."

Participants

Official participants, informal participants, and general sales participants.

Horizontal recycling

Recycling in which used products are used as raw materials to produce the same type of products.

Special Regulations

Special Regulations, described in Article 34 of General Regulations.

Nudge

Means "gently push." The idea of providing information and devices that encourage people to take more desirable actions without prohibiting choices or significantly changing economic incentives.

Net Zero

To achieve zero net emissions by balancing greenhouse gas emissions and removals. The basic meaning is the same as carbon neutral.

Biodiesel

Biofuel for diesel engines, produced by methyl esterifying rapeseed oil and waste cooking oil.

Biomass plastic

A plastic material that uses renewable organic resources such as plants as raw materials.

Informal participants

Those who are allowed to participate outside the display area of official participants by the government representatives of the exhibition (e.g., private Pavilions exhibitors).

Perovskite solar cells

A new type of solar cell that uses a crystalline material called a perovskite compound. This type of solar cell is more resistant to bending and distortion than conventional silicon-based solar cells and can be lighter, attracting attention as it can be installed in places where installation has been difficult.

Methanation

A technology that synthesizes methane, a major component of natural gas, from CO2 and hydrogen.

Renewable diesel

This is a next-generation biofuel produced from waste cooking oil and animal and vegetable oils that do not compete with food.

Hydrogenated biofuel has the same chemical properties and physical properties as diesel fuel.