

Realization of a Sustainable and Environmentally Friendly Society

Policy and Management

TAISEI Green Target 2050

Based on the Group Philosophy “To Create a Vibrant Environment for All Members of Society,” the Taisei Group has set forth in its Environmental Policy and Environmental Targets, the formation of high-quality social capital through corporate activities centered on the construction business in harmony with nature, aiming for the “Realization of a Sustainable and Environmentally Friendly Society.” The Group also supports and respects the United Nations Global Compact and other internationally agreed initiatives on the environment, and is proceeding with efforts in collaboration with various stakeholders.

The construction industry, which is involved in the formation of social capital, is built on the burden on the environment. On the other hand, environmental problems are becoming more and more serious on a global scale, and long-term countermeasures are required. In response to these circumstances, in 2018 we revised our 2050 Environmental Targets (TAISEI Green Target 2050), and set the 2050 Targets for the realization of four societies: a decarbonized society, a recycling oriented society, a nature co-existing society, and a safety secured society. We also agreed with TCFD in 2020, and, following the Japanese government’s decarbonization declaration, partially revised the TAISEI Green Target 2050 and decided to aim for virtually zero CO₂ emissions from business activities by 2050 to realize a decarbonized society.

Going forward, the Taisei Group members will work as one to continue contributing to the realization of a Sustainable and Environmentally Friendly Society (decarbonized society, recycling oriented society, nature co-existing society, safety secured society) based on our 2050 Environmental Targets (TAISEI Green Target 2050).



Correlation between TAISEI Green Target 2050 and TAISEI Sustainable Action

KPIs

■ Realization of a Sustainable and Environmentally Friendly Society

We have identified “Realization of a Sustainable and Environmentally Friendly Society” as a part of Materiality (Important Tasks for the Taisei Group), and this has been established as a principal policy in the Group Medium-term Business Plan (2021-2023). In addition, we have established “–41% At construction stage Reduction of CO₂ emissions per construction cost (intensity),” “–50% At construction stage Reduction of total CO₂ emissions” and “–43% At building operation stage Reduction of design-build estimated CO₂ emissions,” as a KPI objective for FY FY2023. (Compared to FY1990)

Environmental Targets for FY2021 and result for FY2020

TAISEI Green Target 2050	Annual Targets	FY2020		FY2021 Target Values
		Target Values	Result	
Decarbonized Society  CO ₂ emissions from business activities virtually 0	At construction stage *1 Reduction of CO ₂ emissions per construction cost (intensity) KPI	–27%	–30.3%	–36%
	At construction stage *1 Reduction of total CO ₂ emissions KPI	–52%	–54.5%	–52%
	At building operation stage *1 Reduction of design-build estimated CO ₂ emissions (including dissemination and promotion of ZEB) KPI	–40%	–41.4%	–41%
	Reduction of energy consumption per office floor area (intensity)*2	–20%	–22.4%	–25%
Recycling Oriented Society  virtually Final disposal rate of construction waste 0%	Adoption of green (environmentally conscious) procurement items at building design stage	10 items per project or more	11.7 items per project	11 items per project or more
	Reduction of final disposal rate of construction waste	–3.4% or less	–2.7%	–3.3% or less
Nature Co-Existing Society  Minimizing impact on natural capital	Implementation of biodiversity conscious proposal	30 project or more	38 project	35 project or more
	Implementation of biodiversity conscious construction	10 project or more	6 project	10 project or more
Safety Secured Society  Providing value with zero environmental risk	Proper management of construction byproducts and compliance with environmental-related laws and regulations	Zero environmental accidents	Zero environmental accidents	Zero environmental accidents

*1 compared to FY1990

*2 compared to FY2010

● **KPI** Key Performance Indicator



*The Taisei Group made the “Eco-First Commitment” pledge to the Japanese Environment Minister to carry out environmental conservation measures on a group-wide basis, and was officially approved as an “Eco-First Company”.

WEB “Environmental Policy”, “Environmental Targets”, “Declaration of Taisei Corporation on Biodiversity Preservation”
<https://www.taisei.co.jp/english/profile/philosophy/>

Promotion Framework

Environmental Management System (EMS)

Taisei Corporation operates an environmental management system based on ISO 14001 (hereinafter EMS) on a companywide basis, and has established the Environment Committee chaired by the President and administered by the Chief of Environment Division.

The Environment Committee mainly deliberates on important environment-related initiatives for environmental management that lead to the Environmental Policy, Environmental Targets, and external evaluations, and makes reports to the Management Committee. Matters such as Environmental Policy are deliberated in the Management Committee before being presented to the Board, where they are deliberated and decided.

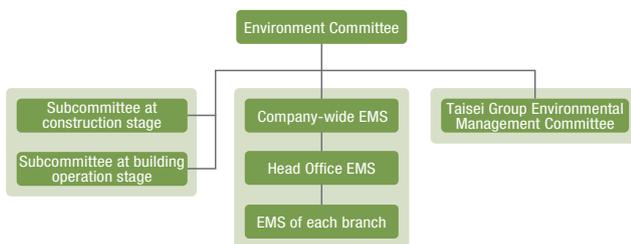
Every division and branch has an EMS secretariat that operates under the Environment Committee, and the environmental staff of each department facilitates and monitors environmental activities, and reflects the results in annual Environmental Targets.

In January 2021, we established the subcommittee at construction stage to promote CO₂ reduction in worksites, the subcommittee at building operation stage to promote decarbonization technologies and services, and the Taisei Group Environmental Management Committee to establish Group targets and manage progress. In this way, we are developing our response to the issues in a way that transcends the boundaries of departments and group companies.

Also in May 2021, we further strengthened our structure to work on decarbonization by newly establishing the Carbon Neutral Promotion Department in the Environment Division, with the objective of promoting and supporting the efforts of Taisei Corporation and our customers to achieve carbon neutrality by 2050.

Apart from the EMS and Environment Division organizations, we are also promoting efforts to resolve environmental issues by establishing organizations such as the CSR Committee, Central Safety Committee, and the Energy-Saving Promotion Council which is for appropriately responding to the Act on the Rational Use of Energy (Energy Conservation Act).

EMS (ISO14001) Organization Chart



ISO14001 certification Scope:

The head office and all 13 branch offices (certified rate: 100%)
Certification registered in 1998



TAISEI Sustainable Action (TSA), an Initiative to Reduce Environmental Impact

To achieve its Environmental Targets, Taisei Corporation is implementing [TAISEI Sustainable Action \(TSA\)](#), an environmental impact-reduction initiative in which all employees participate.

We think it is particularly important for many parties involved in construction work, which represents a large part of the CO₂ emissions from business activities, to be aware of the importance of reducing environmental impact. Therefore, in addition to the [CO₂ Zero Action](#), which is our basic initiative that has been conducted at all worksites so far, each worksite is implementing measures based on the TSA Action List in which effective specific technologies and activities are presented.

In 2020, we developed and adopted the TSA Points System to evaluate each worksite's initiatives to reduce environmental impact by points. This system evaluates by points initiatives at worksites leading to the reduction of environmental impact, such as the use of fuel-efficient heavy machinery, training seminars on fuel-efficient driving, use of LED lighting, and use of energy-saving copiers and air conditioners, and visualizes the impact of the initiatives of individual worksites. We will bring about a change in employees' awareness and behavior by visualizing and quantitatively evaluating the impact of initiatives, in order to further promote TSA initiatives.

In addition, we have established an award system for activities aimed at achieving the Environmental Targets. Through this system we evaluate activities to reduce environmental impact that serve as a model for other divisions, and we work to raise employees' environmental awareness.

* TAISEI Sustainable Action (TSA)

Company-wide activities to reduce environmental impact including fuel-efficient driving of heavy machinery and vehicles, use of hybrid heavy machinery and renewable energy, development of a wellness conscious greening environment, paperless meetings, and use of LEDs for temporary lighting.

* CO₂ Zero Action

An initiative to reduce environmental impact undertaken by all worksites. There are seven actions, including eco-driving of heavy machinery and vehicles, inspection and maintenance, and controlling the temperature setting of air conditioners.



■ Compliance with Declarations to Society and International Codes of Conduct, etc.

TCFD, SBT, CDP

Taisei Corporation strives to improve its environmental performance by steadily carrying out activities based on its Environmental Policy, and by actively disclosing information through the Sustainability website, the integrated report, and other means. We strive to increase the trust of our stakeholders, and deliver value to them and create sustainable business opportunities. In July 2020, the Company agreed with TCFD (Task Force on Climate-Related Financial Disclosures) and decided to actively disclose information on the impact of climate change on its business activities.

We also participate in environment-related initiatives such as the Science Based Target (SBT) and the Carbon Disclosure Project (CDP).

In addition, we are selected as an “A List” company and “Supplier Engagement Leader” by CDP on 2020.

WEB “CDP’s Climate Change A List 2020” https://www.taisei.co.jp/english/ir/news/2020/20201209_release.html

United Nations Global Compact (GC), SDGs

The Taisei Group participated in the GC in April 2018 and committed to disseminating and implementing the Ten Principles in the four areas of human rights, labor, the environment, and anti-corruption. At the same time, it is actively participating in various subcommittees sponsored by the Global Compact Network Japan (GCNJ), such as the Subcommittee on SDGs and the Subcommittee on Human Rights Due Diligence (HRDD), the Subcommittee on Circular Economy. In addition, in order to promote business as a member of the construction industry while always being aware of contributions to SDGs, we are working to ensure that SDGs are widely disseminated within the Group and discussing how to reflect them in our business strategies, and the like.

Keidanren (Japan Business Federation) / Nikkenren (Japan Federation of Construction Contractors)

As a member of Keidanren, we respect the content of its Charter of Corporate Behavior and carry out activities toward the “realization of a sustainable society,” which Keidanren aims to achieve. We also participate in the Committee on Environment and Safety, Keidanren Biodiversity Declaration Initiative, the “Challenge Zero” initiative and “Japan Partnership for Circular Economy” initiative Global Warming Countermeasure Subcommittee, and Environment Management Subcommittee, which are tackling global warming countermeasures and the formation of a recycling-based society.

We are also on the Nikkenren’s taskforce for Voluntary Action Plan on the Environment in Construction Industry, and on its Construction Byproduct Taskforce and Civil Engineering Byproduct Taskforce which contribute to the effective use of resources. In this way, we share information and engage in collaborative initiatives with other companies, thereby contributing to the environmental activities of the construction industry as a whole. In 2014, Nikkenren set construction industry CO₂ reduction targets for 2030 and joined Keidanren’s Phase II of the Commitment to a Low Carbon Society.

In May 2021, the Voluntary Action Plan on the Environment for the Construction Industry was revised to establish targets that include reducing Scope 1 and 2 emissions at the construction stage to effectively zero by 2050. As a member company, Taisei strives to achieve the targets established by the Japan Federation of Construction Contractors.

Taisei Corporation's Eco-First Commitment

The Eco-First Program is an initiative launched by the Ministry of the Environment that certifies companies with leading environmental practices. Taisei Corporation has been certified as an “Eco First Company” based on the Eco First Commitment made with the Minister of the Environment in May 2012. The commitment has been renewed thereafter and initiatives have been pursued toward its achievement.

■ Disclosure of Information on Environmental Area

Taisei Corporation strives to improve its environmental performance by steadily carrying out activities based on its Environmental Policy, and by actively disclosing information through the Sustainability website, the integrated report, and other means. We strive to increase the trust of our stakeholders, and deliver value to them and create sustainable business opportunities. In July 2020, the Company agreed with TCFD and decided to actively disclose information on the impact of climate change on its business activities.

WEB “Information Disclosure Based on TCFD (Task Force on Climate-Related Financial Disclosures) Recommendations” <https://www.taisei.co.jp/english/csr>

Supply Chain (Environment)

Policy and Management

The Taisei Group has established “Promoting partnerships with subcontractors and suppliers” in its Group Action Guidelines. This entails clarifying mutual roles and responsibilities with subcontractors and suppliers, establishing relationships that are fair and achieve mutual trust, and selecting subcontractors and suppliers in a rational manner through a comprehensive assessment of price, technical capabilities, financing capacity, social credibility as a company, consideration for the environment and other factors.

Taisei works to promote Zero Energy Buildings (ZEB) and provide other decarbonisation technologies and services to customers. In addition, we share policies with affiliates and work with them to reduce CO₂ emissions at construction workplaces, as part of our practical initiatives aimed at decarbonizing the entire value chain. Since 2001, we have established and employed Taisei Green Procurement Guidelines for the use and promotion of environmentally friendly construction materials and techniques in the design, construction, use and decommissioning of structures. The content to be observed by suppliers is provided in the form of our CSR Purchasing Guidelines which were established in 2014. The guidelines were revised in 2020 to further clarify the sections relating to human rights and the environment due to increased interest in these matters on the part of the general public.

WEB “CSR Purchasing Guidelines” <https://www.taisei.co.jp/partner/csr.html>

Promotion Framework

● Monitoring

The Taisei Sustainable Action (TSA) program works to reduce environmental load at the construction stage in all domestic and some overseas workplaces. Through this program, Taisei works with numerous affiliates in the supply chain to pursue its CO₂ Zero Action initiative on a daily basis in seven areas that include reduced energy consumption, use of rainwater and fuel-saving operation of heavy machinery and other vehicles. Specific effective technologies and activities are identified in a “TSA Action List” for use in implementing policies at individual workplaces.

In 2020, Taisei established the Taisei Sustainable Action (TSA) Point System, the first of its kind in the construction industry, which establishes specific implementation items and a menu of targets for specific technologies and activities that are known to be effective. CO₂ reduction initiatives are assigned points and the implementation status at each workplace is clearly indicated. A high score is assigned to the adoption of methods that are highly effective in reducing CO₂ emissions, such as the use of energy-efficient heavy machinery. The system is expected to aid in risk assessment and promote effective activities to achieve environmental targets.

● Supplier Engagement Leader

We also participate in environment-related initiatives such as the Science Based Target (SBT) and the Carbon Disclosure Project (CDP). In addition, we are selected as an “A List” company and “Supplier Engagement Leader” by CDP on 2020.

WEB “Supplier Engagement” <https://www.cdp.net/en/research/global-reports/transparency-to-transformation#supplier-engagement>

● Utilizing the Green Procurement Guideline in Cooperation with Suppliers

Report See the Taisei Group Environmental Report 2021 p.11 For Realization of a Recycling Oriented Society

● ISO14001/ISO9001

WEB “Consumer Issues” <https://taisei.co.jp/english/sustainability/iso26000/consumer/>

For Realization of a Decarbonized Society

Policy and Management

Taisei Corporation has set the achievement of virtually zero CO₂ emissions from business activities as one of the 2050 Targets in its 2050 Environmental Targets, TAISEI Green Target 2050, aiming to reduce CO₂ emissions and contribute to the realization of a decarbonized society.

Our two targets for 2030, which are the benchmarks of the TAISEI Green Target 2050, have been certified by the **SBT initiative**: one is the 62% (vs. fiscal 1990) CO₂ emissions reduction target at the construction stage, and the other is the 55% (vs. fiscal 1990) CO₂ emissions reduction target at the building operation stage. To achieve the CO₂ reduction target at the construction stage, we are promoting initiatives to reduce the environmental impact (TSA) in which all employees participate,

as well as initiatives such as cooperating with specialized contractors (suppliers) and encouraging them to conduct conservation activities during construction and use heavy machinery and vehicles with high energy efficiency.

In addition, we have been working to use ZEB as a temporary worksite office that had not been considered as a target of energy conservation/ CO₂ reduction initiatives due to its short usage period. In 2020 we obtained ZEB Ready certification for the first time in Japan for a temporary worksite office, and due to this initiative we were awarded the Special Award from the Judging Committee in the Energy Conservation Grand Prize program of the Energy Conservation Center, Japan (ECCJ).

For achieving the CO₂ reduction target at the building operation stage (for use by customers), we are promoting the provision of advanced energy conservation and ZEB technologies and accumulating construction results, while working with customers and other various stakeholders in the value chain. At the Taisei Group, we are implementing initiatives to reduce CO₂ emissions at each phase of the value chain from the planning/design stage considering the lifecycle of the building, through the construction stage including new building construction, renewal and demolition, to the operation stage after completion and delivery to the customer, for the realization of a decarbonized society.

Risks and Opportunities

For the construction industry, rising temperatures in recent years, large-scale typhoons, and disasters caused by extremely concentrated heavy rain pose risk factors such as interruptions and delays in construction work. On the other hand, increased demand for net zero energy buildings (ZEB), which is a measure to mitigate climate change, will lead to the creation of opportunities for orders. Taisei Corporation supports the Challenge Zero project of Keidanren (Japan Business Federation). In the field of renewable energy, it is working on ZEB and began technological development for floating offshore wind power generation facilities. In addition, we consider the green infrastructure promoted by the Ministry of Land, Infrastructure, Transport and Tourism as a means of mitigating and adapting to climate change as one of the opportunities to receive orders through our market expansion aimed at strengthening infrastructure, and we are promoting relevant technological development and design proposals.

2030 Targets Certified by the SBT initiative

By 2030, reduce the Scope 1 and Scope 2 greenhouse gas emissions by 26% from fiscal 2013 levels (62% reduction from fiscal 1990 levels), and the Scope 3 emissions by 25% from fiscal 2013 levels (55% reduction from fiscal 1990 levels)

- Scope 1: Direct emissions associated with fuel use for heavy machinery and vehicles at construction worksites
- Scope 2: Indirect greenhouse gas emissions associated with electricity use at construction worksites
- Scope 3: Indirect emissions associated with energy use during the operational phase of the building delivered

SBT initiative:

Founded in 2015, this organization (initiative) requires companies to establish "Science Based Targets (SBT)" to contribute to the Paris Agreement, which has set the goal of limiting temperature increase to less than 2°C above the pre-industrial level.



WEB SBT initiative <https://sciencebasedtargets.org/companies-taking-action/>

Promotion Framework

■ EMS's Organizational (EMS)

Taisei Corporation operates an Environmental Management System (EMS) based on ISO14001 on a company-wide basis. We have established an Environmental Committee, chaired by the President, which deliberates and decides on environmental policy and environmental targets that are important for environmental management, in addition to medium- and long-term targets and environment-related initiatives that lead to external evaluations.

● TAISEI Sustainable Action (TSA)

An Initiative to Reduce Environmental Impact

To achieve its Environmental Policy and Environmental Targets, Taisei Corporation is implementing TAISEI Sustainable Action (TSA), an environmental impact reduction initiative in which all employees participate. In proceeding with this initiative, it is particularly important for many parties involved in construction, which has high CO₂ emissions, to be aware of the importance of reducing environmental impact. Therefore, in addition to the “CO₂ Zero Action,” which is our basic initiative that has been conducted at all worksites so far, effective specific technologies and activities are summarized in the “Action List,” and the materials, products and technologies used are explained in an easy-to-understand manner with photographs. In addition, the Company has established an award system for activities aimed at achieving the Environmental Targets.

Through this system we evaluate activities to reduce environmental impact, which serves as a model for other divisions, and we work to raise employees’ environmental awareness.

● Acquired ZEB Ready Certification for the New Itami City Hall and Its Temporary Worksite Office, the First of Its Kind in Japan

The construction of the new city hall building has been planned aiming for an environmentally friendly city hall under the concept of “a city hall that is full of dreams and attractiveness and supports a safe and secure life of residents.”

Kengo Kuma & Associates, the architect office that was in charge of the basic design, set a design concept of “achieving **ZEB Ready** certification as a large-scale city hall building over 20,000 m² while overcoming various challenges that the reconstruction project faces, such as reconstructing the city hall utilizing the existing building, conceiving a design in consideration of regional development and scenery, BCP, and seismic isolation.” Taisei Corporation received the order for this project in a design-build (DB) method, taking charge of execution design through construction.

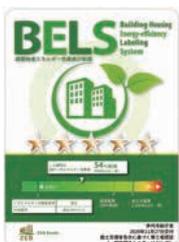
In addition to its being planned as a highly heat-insulated and well-sealed building capable of natural lighting and ventilation, the city hall also generates power as it equipped with a photovoltaic facility with a storage battery for disasters, achieving a 54% reduction in energy consumption in total. Thanks to the above measures, this project was adopted as one of the “resilience-enhancement type ZEB demonstration projects” of the Ministry of the Environment.

Meanwhile, in line with the environmentally friendly concept of the new city hall, we also worked on reducing CO₂ emissions during construction. The temporary worksite office in construction work adopted versatile energy-saving technologies, such as a high-efficiency air conditioning system, LED lighting, and heat pump water heater. These technologies, in addition to an improved heat insulation capacity, contributed to the 54% reduction in primary energy consumption compared to a standard building.

Due to these measures, for the first time in Japan, not only the permanent city hall building but also the temporary worksite office obtained ZEB Ready certification.

ZEB Ready

A building that meets 50% or more reduction in primary energy consumption from the standard primary energy



Building Energy-efficiency Labeling System (BELS) Certification

A third party accreditation system established by the Ministry of Land, Infrastructure, Transport and Tourism to assess and display building energy-saving performance, etc.

The new city hall obtained ZEB Ready certification under BELS

New Itami City Hall

The temporary worksite office obtained ZEB Ready certification under BELS

● Promoting Green Infrastructure as a Measure for Adapting to Climate Change

In the Shinagawa Season Terrace, a multi-purpose building that makes effective use of the upper part of the Water Reclamation Center, we built a reservoir for rainwater in the basement of the Center, in order to temporarily store water during the early stages of heavy rain, to prevent polluted water from flowing directly into the sea. The building demonstrates other multifaceted functions of green structures, including the creation of a wide open green space situated on artificial ground constructed above the ground, reduction of the heat island effect on the city by using this greenery to cool wind from the Tokyo Bay before sending it into the city area, and conservation of biodiversity by fostering new ecosystems through waterfront creation using rainwater.

Green Infrastructure:

Efforts to promote the creation of sustainable and attractive national land, cities, and regions by utilizing the diverse functions of the natural environment in terms of both hardware and software, such as social infrastructure development and land use. As countermeasures against climate change, there are measures to improve ground surface coverage by optimizing national land management, conserving green areas and promoting greening, measures to absorb CO2 by utilizing green areas and seagrass beds, measures to store and infiltrate rainwater by utilizing soil and permeable pavement, and heat mitigation measures that utilize the transpiration effects of planting.

● Renewable Energy Projects

Taisei will promote initiatives relating to both land-based wind power generation and offshore wind power generation projects in general ocean areas, both of which are expected to be introduced and expanded in the future.

Wind power generation projects

● Proposed offshore wind power generation project in northern Niigata Prefecture

Taisei is currently conducting a feasibility study for an offshore wind power generation installation to be constructed off the coast of northern Niigata Prefecture. A Document on Primary Environmental Impact Considerations was sent to the Minister of Economy, Trade and Industry on June 3, 2019, in accordance with the Environmental Impact Assessment Act and the Electricity Business Act, and the Minister's opinion was received on August 26 of that year.

● Promotion of technical development accompanying the project

<Technologies for simulating windmill backwash and turbulence>

In developing wind power stations, it is important to be able to accurately predict the amount of power that will be generated. Depending on the placement of windmills, the backwash from windmills on the upwind side may attenuate and reduce the power generated by windmills located downwind. This may also cause an unbalanced wind load that causes windmill failure. Taisei is pursuing the development of technologies to simulate these phenomena.

<Development of concrete foundations for floating offshore wind generation facilities>

On October 10, 2019, Taisei Corporation and the French company Ideol signed a Memorandum of Understanding for the joint development and promotion of floating foundations for floating offshore wind generation facilities for the Japanese market, using Ideol's patented Damping Pool® technology.

Geothermal power generation projects

Japan ranks third in the world in terms of number of volcanos, and it has tremendous potential for geothermal energy development. Taisei Corporation is involved in the development and administration of the following geothermal power generation projects as a purely domestic energy source developed using Japanese resources.

Biomass power generation projects

The fuels used for biomass power generation are environmentally friendly carbon-free resources that include wood, sewage sludge, domestic livestock feces and urine and food residue. Taisei is involved in the following biomass power generation projects that incorporate combustion methods and various types of fuels.

● Energy Services

Energy supply projects (ESP)

Taisei Corporation has conducted mixed-use development projects and established Energy Centers at production facilities, and is participating in projects to supply electricity and heat. Heat source and other energy supply equipment is centralized to optimize the overall energy supply and achieve advantages for building owners, including in terms of Business Continuity Planning (BCP)*¹ and Data Continuity Planning (DCP)*².

*1BCP:
Business Continuity Plan
*2DCP:
District Continuity Plan

Energy Management (EM) Projects

Taisei analyzes and evaluates policies for the operation of building heat source equipment and the use of building energy, etc., and provides advice to ensure that energy use is always rational.

Energy Support Projects

Taisei provides support for building energy management to ensure that energy-saving performance is being achieved during the operation of Zero Energy Buildings and other buildings. The degree of achievement of energy conservation is reported in energy reports.

● Next-Generation Energy

Use of hydrogen

Hydrogen is being called a purely domestically produced energy source that can be stored on a long-term basis. It is seen as a next-generation energy resource that can be used for power generation using fuel cells and as thermal energy.

— Metal hydride (MH) can be used to absorb hydrogen at low pressure in order to transport the hydrogen safely. Taisei is participating in a project to verify hydrogen supply chains that utilize this technology.

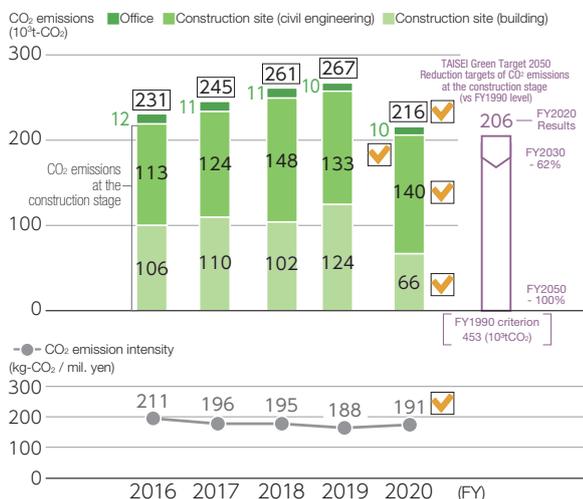
● Participation in proving test of low-pressure hydrogen delivery system

Taisei is participating as one of the leading companies in the Environment Ministry's low-carbon hydrogen technology verification project conducted with regional cooperation (FY 2018) in Muroran City, Hokkaido.

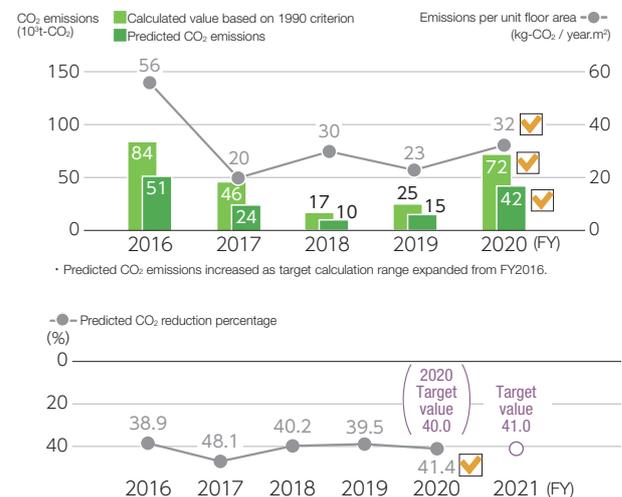
● Development of “environmentally friendly concrete”

Report See the Annual report 2021 p.40

CO₂ Emissions by Business (Non-Consolidated)



Prediction of CO₂ emissions in the building operation stage and reduction percentage (Non-consolidated)



For Realization of a Recycling Oriented Society

Policy and Management

The Taisei Group has set forth “Promoting environmental conservation and creation” in the Action Guidelines for Taisei Personnel and the Taisei Group as aWhole, and clearly stated that it endeavors to reduce environmental impact through the implementation of energy-saving measures and the “3R” policy (reduce, reuse and recycle) and propose technologies and ideas that will facilitate the creation of new environments.

As one of the 2050 Targets, Taisei Corporation has committed to achieve the “final disposal rate of construction by products of 0%” in its 2050 Environmental Targets, TAISEI Green Target 2050. To achieve this target, we aim to reduce the final disposal rate to 3.0% or less by 2030. We ensure thorough compliance with laws and regulations of countries where we operate, and work on setting requirements higher than legally mandated. Based on the understanding that reducing pollutant and waste emissions is a corporate social responsibility, we are aiming to achieve the 0% final disposal rate of construction byproducts from our construction business, through reducing and recycling such byproducts, promoting green procurement, and extending the life of buildings.

Risks and Opportunities

There is a growing need to promote sustainable procurement throughout the supply chain, such as resource conservation, use of materials that can be recycled and reused, and measures to deal with the problem of single-use plastics and other natural environmental pollution caused by waste. At Taisei Corporation, we are working on waste management and the recycling of resources at worksites, adopting materials and equipment that take into account green procurement and the lifecycle from the design stage, and providing technologies to extend the life of buildings.

Promotion Framework

EMS’s Organizational (EMS)

Taisei Corporation operates an Environmental Management System (EMS) based on ISO14001 on a company-wide basis. We have established an Environmental Committee, chaired by the President, which deliberates and decides on environmental policy and environmental targets that are important for environmental management, in addition to medium- and long-term targets and environment-related initiatives that lead to external evaluations.

Effective Use of Waste Plastics

Construction materials, packaging materials, and other waste plastics are sorted thoroughly and properly recycled by specialized disposal companies.

In addition, we are implementing measures to utilize waste plastic by combining it with waste wood products and creating artificial recycled wood products.

Taisei Corporation supports the [Plastics Smart](#) Campaign by the Ministry of the Environment.

Sorting resources	Recycling resources	Reusing resources
		
Sorting and collection of waste plastics	Dissolving Styrofoam (foam material)	Using recycled wood • Louver (photograph) • Walking decks, etc.

*Plastics Smart

A campaign by the Ministry of the Environment to promote “a smart way of dealing with plastic” nationwide, including thorough elimination of littering and illegal dumping, and thorough reduction of single-use plastic and sorting and collection.



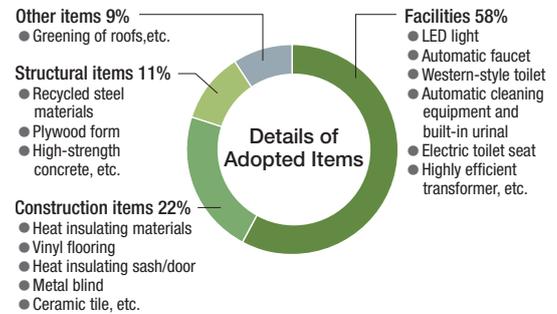
● Utilizing the Green Procurement Guideline in Cooperation with Suppliers

In 2001, Taisei Corporation established and put into effect the Taisei Corporation Green Procurement Guideline to promote the use of materials, equipment and building methods that have small environmental impact during the design, construction, operation and demolition of structures.

We also conduct target management on green procurement items, and the number of items adopted in fiscal 2020 was 11.7 items.

By referring to and reflecting the content of the Green Purchase Law (Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities), we review the subject items every year. In fiscal 2020, 94 items were included in the guideline. Company-wide application of the guideline means we can not only recycle resources but also save energy, reduce CO₂ emissions, save resources, avoid use of toxic substances and preserve the natural environment.

Adoption of Green Procurement Items (Construction design phase: non-consolidated)

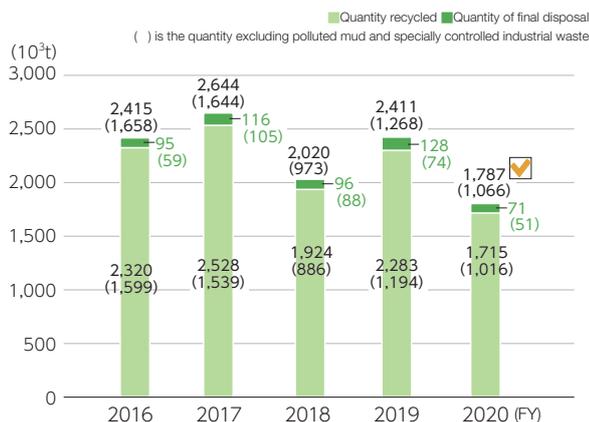


Award The “Program for the Promotion of Resource Recycling of Building Materials through More Advanced Collection Patrol Systems” Received the Ministry of Economy, Trade and Industry’s Industrial Technology and Environment Bureau Director’s Award

We operate a “collection patrol system” for many types of waste, including waste plastics at our construction sites in Tokyo. We received the Ministry of Economy, Trade and Industry’s Industrial Technology and Environment Bureau Director’s Award in the 2020 Resource Recycling Technology and System Awards for a joint initiative for resource recycling of building materials between Taisei Corporation and our consolidated subsidiary and logistics operator Network Alliance Corporation. We are working to recycle soil from construction sites within and across worksites, and contributing to waste reduction and effective resource use of the industry as a whole.



Quantity of Construction Waste (Non-Consolidated)



Emissions and Recycling Rate by Construction Waste Category

Unit: 10³t

Construction waste	Civil engineering	Building construction			Total	Recycling rate
		New construction	Demolition	Subtotal		
Concrete remnants	121	196	309	505	625	100%
Asphalt - concrete remnants	50	114	17	131	182	100%
Construction site sludge	401	287	11	298	698	—
Mixed waste	12	32	4	36	48	70.7%
Wood scrap	10	9	2	12	22	95.0%
Metal scrap	2	14	14	28	30	99.4%
Miscellaneous	76	80	26	106	182	74.0%
Total	671	732	384	1,116	1,787	—

For Realization of a Nature Co-Existing Society

Policy and Management

The Taisei Group has set forth “Promoting environmental conservation and creation” in the Action Guidelines for Taisei Personnel and the Taisei Group as a Whole, and clearly stated that it recognizes the importance of environmental issues and actively works to promote environmental conservation and creation with a view to realizing a harmonious coexistence between nature and human beings.

As one of the 2050 Targets, Taisei Corporation has committed to “minimizing impact on natural capital” in its 2050 Environmental Targets “TAISEI Green Target 2050.” To achieve this target, we set the goal of implementing 35 or more proposals that take biodiversity into consideration, using such means as our unique biodiversity evaluation tools, the Concierge Series. We identify risks at the construction planning stage and, through the cooperation of related internal departments including the design division, construction/civil engineering work division and the Taisei Advanced Center of Technology, use the various technologies owned by the Taisei Group to minimize the adverse impacts on biodiversity of the local area. In order to clarify its corporate stance on the conservation and creation of biodiversity, Taisei Corporation has agreed to the Declaration of Biodiversity by Keidanren, and formulated the Declaration of Taisei Corporation on Biodiversity Preservation in 2010. Since 2020, we have been supporting Declaration of Biodiversity by Keidanren and Action Policy (revised edition).

Risks and Opportunities

There is concern that construction work will always have a significant impact on the surrounding environment, including nature. At the planning stage, we identify risks, including violations of environmental laws and regulations, and opportunities to create added value. From the design and construction stage to the operation and management support after completion, we provide our customers with solutions that help create a rich environment while giving consideration to biodiversity.

We will contribute to the realization of a society in harmony with nature by appropriately evaluating the value of natural capital, utilizing it for infrastructure development and building planning, and minimizing the impact of construction work.

WEB “Declaration of Taisei Corporation on Biodiversity Preservation” <https://www.taisei.co.jp/english/profile/philosophy/policies/>

Promotion Framework

■ EMS’s Organizational (EMS)

Taisei Corporation operates an Environmental Management System (EMS) based on ISO14001 on a company-wide basis. We have established an Environmental Committee, chaired by the President, which deliberates and decides on environmental policy and environmental targets that are important for environmental management, in addition to medium- and long-term targets and environment-related initiatives that lead to external evaluations.

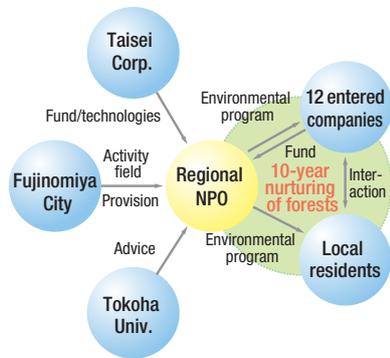
● Biodiversity-Conscious Research, Planning, Construction and Monitoring

Taisei Corporation has adopted mechanisms for identifying risks relating to biodiversity at the construction planning stage and following up on them throughout the entire process from construction through completion. For projects in which consideration for ecosystems needs to be emphasized, Ecological Planning — Taisei’s proprietary environmental planning technique — is employed to propose appropriate conservation measures to the client based on research and analysis, such as plans that contribute to coexistence with nature, in order to achieve preservation and restoration of suitable natural environments.

Ecological Planning is the equivalent of the Biodiversity Action Plan (BAP) in the Convention on Biological Diversity. Taisei uses its various technologies to study and analyze the environment at the construction site and the surrounding area, and then drafts and executes a plan based on regional characteristics in an effort to construct good quality social capital. Monitoring is conducted following completion and the results are used as feedback for technological improvement.

Taisei has also developed the Concierge series of proprietary biodiversity assessment and planning tools. These tools allow anyone to easily determine the environment at construction sites and share this information to appropriately preserve and create natural environments. We also conduct monitoring and predictive assessments. In 2020, Taisei developed *Mizube* (waterfront) Concierge, the third in its Concierge series of tools following *Ikimono* (living creatures) Concierge and *Mori* (forest) Concierge. Deploying these tools for projects in which endangered species need to be protected will help to achieve a society that is in harmony with nature.

Award Initiatives for Nature in Fujisan Nanryo Industrial Park Received the Environmental Award of the Japan Society of Civil Engineers and ENAA's Engineering Commendation Award



Under the theme of “a manufacturing base where greenery, people and production come together,” Taisei Corporation is carrying out the Fujisan Nanryo Industrial Park (Eco-Factory Mt. Fuji) development project in Fujinomiya City located at the south foot of Mt. Fuji.



Fujisan Nanryo Industrial Park Development Project

Developing the Fujisan Nanryo no Mori FSPJ scheme, a sustainable action to nurture forests in collaboration of industry, government, academia, and local people, we have supported nurturing forests for more than ten years from completion of construction. This is a pioneering initiative to balance economic activity and harmonious coexistence with nature in that it

adopts forest nurturing methodology from a medium- to long-term perspective and business model with forest as its theme. We intend to utilize and deploy this as a tool to realize a nature co-existing society. This initiative was praised externally, and received the 2020 Environmental Award of the Japan Society of Civil Engineers (Group-2) and the 2020 Engineering Commendation Award of ENAA (Environmental Contribution).

Biodiversity Conservation and Cases

Long-term monitoring survey

The Sapporo Dome

In the construction of the Sapporo Dome, which was completed in 2001, right from the planning stage, we used our environmental planning technology to plan an external structure that emphasized the conservation of biodiversity. The technology employed in this project was Ecological Planning, Taisei Corporation's proprietary environmental planning tactics, which facilitates the design of spaces that preserve the region's inherent ecosystems from the planning stage.

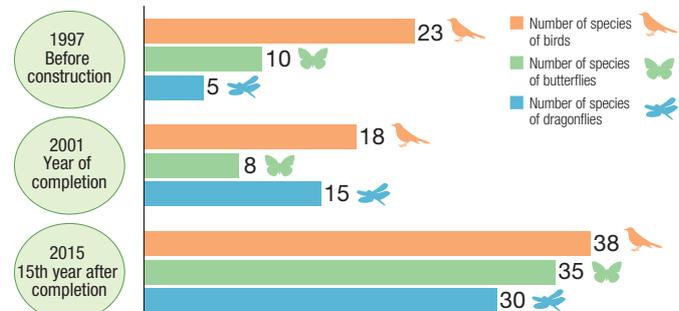
In order to verify that the environment is actually inhabited by various types of living creatures, we have conducted long-term monitoring surveys based on the number of species of birds, butterflies, dragonflies, and other creatures, from the planning stage in 1997 to the completion of construction in 2001, at both 3 years and 10 years after construction, and also in the present day.

Knowledge and concrete results accumulated during this process have been used for the development of the biodiversity communication tools, such as “Ikimono Concierge” and have contributed to the conservation and sustainable use of natural resources through various environmental awareness activities conducted by Sapporo Dome Co., Ltd.

These initiatives were recognized as “Sapporo Dome ECOMOTION and Taisei Ecological Planning” as an affiliated project of the “Japan Committee on UNDB “Japan Committee on UNDB(United Nations Decade on Biodiversity).



Number of species confirmed by biological monitoring



Improvement of Facility Value through Biodiversity Conservation and Creation

• The ESR Amagasaki Distribution Center

An environmental certification that proves natural environmental consciousness of a facility increases the value of the facility and appeals to customers as proof of an environmentally conscious company.

Leveraging its strength as a general construction firm capable of executing projects from start to finish, from the planning and design of facilities to their construction, Taisei Corporation conducts environmental assessments of projects, including the impact on biodiversity, from the early stages of development planning, and incorporates consideration for the environment into project plans. In so doing, we strive to minimize environmental impacts and support our clients' environmental activities, such as the conservation and creation of biodiversity as well as the acquisition of environmental certifications.

At the stage of planning and design of the ESR Amagasaki Distribution Center (ordered by ESR), a logistic facility located at the Osaka bay-side area, for example, an outer green area was planned, designed, and constructed by Taisei Corporation to help improve the biodiversity without affecting capabilities as a logistics facility.

The facility earned the “Business Innovation in Harmony with Nature and Community” certification from the Association for Business Innovation in Harmony with Nature and Community (ABINC) as a logistics facility that respects biodiversity.



ESR Amagasaki Distribution Center (ordered by ESR)

• Eco Globe Kure Biotope (Kure City, Hiroshima)

The general waste final treatment plant, Eco Globe Kure, was completed and began operations in 2015 as a place to express and communicate nature restoration technologies. We recreated the waterside environment that was going to be lost with the construction of the treatment plant and created a biotope inhabited by diverse flora and fauna, including rare species.



● Consideration of Biodiversity for Proposal (risk assesment)

During civil engineering construction, there are many chances to face the natural environment. Therefore, we propose measures to protect endangered animals and plants and avoid having an influence on them considering biodiversity. As for construction, our biodiversity evaluation tools such as “**Ikimono Concierge**”, “**Mori Concierge**” and “**Mizube Concierge**” are effectively used for greening plans at construction sites or for redevelopment projects.



Mizube Concierge

*Ikimono Concierge®:

Our unique tool for predicting and identifying animals that can be attracted by a planning site

*Mori Concierge®:

Our unique tool enabling the selection of plants that can adapt to the environment of a planning site

*Mizube Concierge®:

Our tool for developing a unique plan to conserve and compensate waterside rare flora and fauna whose ecosystems may be affected by construction

● Implementation of Activities to Contribute to Environment and Society in Cooperation with Various Stakeholders

Our approach to enhancing biodiversity is guided by Environmental Policy and Declaration of Taisei Corporation on Biodiversity Preservation, and demonstrated as a company-wide activity to reduce environmental impact under our unique biodiversity conservation guidelines, etc. Not limited to biodiversity consideration in the business, our efforts include offering volunteer opportunities for the Group employees and their families to make nest boxes for dormice as part of natural environmental education through forest conservation activity, and to participate in [Tokyo Greenship Action](#)*1 for more than ten years

*1 [Tokyo Greenship Action](#) Participated in the "Tokyo Greenship Action," a nature conservation program hosted by Tokyo Metropolitan Government.

● The Taisei Group Environmental Volunteers

1) Making dormouse nest boxes

Since 2004, Taisei Corporation has participated in the Animal Pathway (bridges for tree-dwelling rodents) Research Society, and has supported ecosystem conservation activities for tree-dwelling rodents, such as the dormouse, through development and facilities for animal pathways and monitoring. As part of these activities, our group employees and their families participate every year in volunteer activities to construct dormouse nest boxes. In our activities held, we donated these boxes to the Dormouse Museum of KEEP, Inc.

We have conducted this environmental volunteering activity every year, with participants working to build a total of 2,945 dormouse nest boxes, thus far.



Dormouse nest boxes made in volunteer activities

2,945

2) TAISEI 1 Ton CLUB

Since 2010, we have conducted this environmental contribution activity a total of 9 times, under the theme of "simultaneously achieving carbon offsets at the Company and in the homes of employees."

In 2012 and 2015, we supported the Kamaishi Forest Owner's Association, which manages the mountain forests of Unosumai District. On May 9, 2017, a large-scale wild fire occurred in the District due to a suspicious fire, resulting in the burning of 413 hectares as well as heavy damage. Accordingly, we continued our support through fundraising to donate the cost of planting saplings for the reforestation of Kamaishi Forest. We were also involved in the construction of Kamaishi Unosumai Memorial Stadium, where trees that had been felled by the fire in Unosumai District were used to make wooden seats, public toilets, benches and louvers sunshades.



Employees participating in the "TAISEI 1 ton CLUB"

1,381



Status of saplings for donation for planting

For Realization of a Safety Secured Society

Policy and Management

The Taisei Group has stipulated “Communication with local communities” in the Action Guidelines for Taisei Personnel and the Taisei Group as a Whole, and clearly stated that it endeavors, in executing its duties, to prevent the generation of environmental effects such as noise, vibration, and odor, and to protect the living environment of local residents and neighboring areas.

Taisei Corporation has committed to “aim to provide value with zero environmental risk” in order “to realize a society where safety is ensured” as one of the 2050 Targets in its 2050 Environmental Targets, TAISEI Green Target 2050.

To achieve this target, we will work to continue having “zero environmental accidents by properly managing construction byproducts and complying with environmental laws and regulations” by 2030. To achieve these medium- to long-term targets, Taisei Corporation has set specific, quantitative annual targets and KPIs, and is making efforts while checking their progress. In addition, we are making efforts to reduce the impact of construction work on the environment, and aiming to continue having zero environmental

accidents while setting the management of toxic substances and polluted water (prevention of water pollution caused by construction wastewater, etc.) as a management priority.

Risks and Opportunities

Environment pollution caused by construction has a significant impact on the surroundings and society. Compliance with environmental laws and regulations is always one of the most important environmental issues. We keep contributing to the reduction of socio-environmental risks during construction by promoting the proper management of construction waste, the development and application of new technologies to comply with the regulations for soil pollution and the promotion of methods that reduce the burden on the surrounding environment.

Promotion Framework

EMS's Organizational (EMS)

Taisei Corporation operates an Environmental Management System (EMS) based on ISO14001 on a company-wide basis. We have established an Environmental Committee, chaired by the President, which deliberates and decides on environmental policy and environmental targets that are important for environmental management, in addition to medium- and long-term targets and environment-related initiatives that lead to external evaluations.

Risk Measures at Worksites

With a “worksite environment patrol,” the Environment Division of the Head Office and branches conduct an internal audit to check the observance of the environment law and regulations at worksites. As for the findings, we establish corrective and preventative measures for continuous improvement.

At a worksite, based on the Environment Management manual, we provide environmental education to our employees and specialized contractors. By sharing the cases that could result in an environmental accident, issuing notifications of the proper management of toxic substances such as asbestos and PCB, and reinforcing adequate control and treatment of polluted soil, we have been raising awareness of the importance of environment management and the prevention of environmental accidents. Regarding the management of water resources, Taisei Corporation is working to “prevent water pollution caused by construction wastewater and the like” as a management priority. In fiscal 2020, there were no violations of environmental laws and regulations caused by construction wastewater.

Risk Measures at Worksites

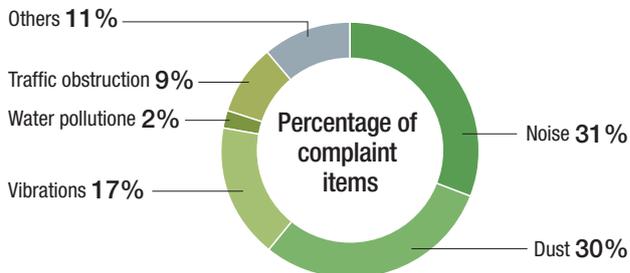
Type	Measure (Example)
Dust	In response to a complaint about the dust generated by construction, we implemented measures such as water sprinkling and installing sheets.
Noise	In response to a complaint about the noise generated at the nighttime concrete-related work, we made early notification to the neighborhood.
Vibration	In response to a complaint about the vibration caused by heavy machinery work in the factory, we changed our schedule to carry out work on factory holidays.
Water pollution	In response to fuel leaks from a crane barge, we used absorption mats for recovery and took recurrence prevention measures.

● Complaint to Worksites and Handling Thereof

We take proper measures regarding environment-related complaints addressed to a workplace, make a record and report using a communication sheet based on the EMS procedure and share the information horizontally among concerned departments or within the entire Company as required.

In addition, we are properly handling comments given by citizen groups.

Percentage by complaint item



● Developing new technologies to realize a society that ensures safety

1) Use of Life Cycle Analysis (LCA)

Life cycle analysis (LCA) of structures aims to assess the overall environmental impact of buildings from their construction through to their use and eventual demolition. In the construction sector, the Architectural Institute of Japan has released guidelines for building LCA, and Taisei Corporation also makes use of this tool. Taisei Corporation proposes the optimal buildings and equipment by predicting the necessary costs and environmental load of the structures that it builds throughout their long life cycle, from the planning and design phase that considers the entire building life cycle, to the construction phase that includes new construction, refurbishment, and demolition, and the operations phase after the work is completed and delivered to the customer.

2) Established a water treatment process using the degrading bacterium.

1,4-dioxane is a chemical substance that is commonly used as a solvent in the chemical industry, but it is now subject to water pollution regulations. However, since this substance does not decompose easily, the environmental burden and cost required for its handling pose major issues. We searched for 1,4-dioxane-degrading bacterium from various environments, and found a new bacterium to degrade 1,4-dioxane effectively. We have established a water treatment process using the degrading bacterium, and completed verification using polluted groundwater and factory wastewater.

3) Developed a Cutting-Edge Method of Demolishing Skyscrapers Known as “Tecolep-Light system”

We successfully developed “Tecolep-Light system,” a cutting-edge method of demolishing skyscrapers. The Tecolep system is an environmentally-conscious method of demolishing skyscrapers by repeatedly jacking down from the upper level, while minimizing dust, noise, and other particles, etc. which may negatively affect the surrounding environment.

Unitized lightweight roof structures can reduce the time to create a closed space, allowing demolition work to be completed in a shorter period of time.

Taisei Corporation Material Flow

Third-party assured values are indicated with the  mark

INPUT	Units	FY 2016	FY 2017	FY 2019	FY 2010	FY 2020
Total energy use	10 ⁹ MJ	3.67	3.90	4.14	4.39	3.60 
Construction Site (building)	10 ⁹ MJ	1.61	1.72	1.61	1.99	1.04 
Construction Site (civil engineering)	10 ⁹ MJ	1.81	1.95	2.31	2.18	2.35 
Offices	10 ⁹ MJ	0.24	0.23	0.22	0.22	0.22 
Total fossil fuel use	10 ³ kL	61.9	68.9	79.0	76.7	61.4 
Diesel	10 ³ kL	60.0	66.3	77.8	75.2	60.0 
Kerosene	10 ³ kL	1.4	2.0	0.5	0.6	0.9 
Heavy oil	10 ³ kL	0.5	0.6	0.8	1.0	0.5 
Total electricity use	10 ⁹ kWh	129	125	111	145	122 
Construction Site (building)	10 ⁹ kWh	35	49	43	57	21 
Construction Site (civil engineering)	10 ⁹ kWh	76	60	52	73	87 
Offices	10 ⁹ kWh	18	16	15	15	15 
City gas (offices)	10 ³ m ³	94	227	140	213	259 
Total quantity of the main construction materials	10 ³ t	7,738	6,811	6,540	7,369	4,966 
Ready mixed concrete	10 ³ t	4,833	4,375	3,375	4,066	3,855
Aggregates (gravel, crushed stone, etc.)	10 ³ t	1,979	1,679	2,038	2,514	387
Cement	10 ³ t	262	283	695	263	172
Steel	10 ³ t	638	446	414	506	534
Timber	10 ³ t	15	24	16	16	17
Asphalt	10 ³ t	11	4	2	3	1
(of which the green procurement quantity)*1	10 ³ t	681	995	1,253	2,106	1,941
Total concrete formwork use	10 ³ m ²	3,042	4,082	3,464	2,931	3,039
Tropical plywood formwork	10 ³ m ²	1,801	2,850	1,883	1,920	1,990
Alternative formwork	10 ³ m ²	1,241	1,233	1,581	1,011	1,049
Alternative formwork percentage	%	40.8	30.2	45.6	34.5	34.5
Water (consumption)	10 ³ m ³	2,338	1,691	1,436	1,414	1,412 

OUTPUT	Units	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Total CO ₂ emissions	10 ³ t-CO ₂	231	245	261	267	216 
Construction Site (building)	10 ³ t-CO ₂	106	110	102	124	66 
Construction Site (civil engineering)	10 ³ t-CO ₂	113	124	148	133	140 
Offices	10 ³ t-CO ₂	12	11	11	10	10 
Total CO ₂ emissions	10 ³ t-CO ₂	231	245	261	267	216 
Scope1	10 ³ t-CO ₂	138	151	179	172	142 
Scope2	10 ³ t-CO ₂	71	67	57	69	57 
Scope3	10 ³ t-CO ₂	22	27	25	26	17 
NO _x	t	1,040	1,151	1,345	1,302	1,039 
SO _x	t	158	175	205	200	158 
Quantity of Chlorofluorocarbon and halon recovered*2	t	18	12	15	21	—
Construction waste	10 ³ t	2415	2,644	2,020	2,411	1,787 
Quantity recycled	10 ³ t	2,320	2,528	1,924	2,283	1,715
Quantity of direct final disposal	10 ³ t	95	116	96	128	71
Water (discharged)	10 ³ m ³	8,172	4,701	4,483	4,288	6,625

*1 The quantity used as green procurement products out of the main construction materials

*2 Up to FY2019, the quantities of fluorocarbons and halons emitted by Taisei that have been recovered have been tabulated and disclosed (halon recovery quantities since FY 2018), in accordance with the Fluorocarbon Recovery and Destruction Act. In FY2020, leak quantities were tabulated in accordance with the Act for Rationalized Use and Proper Management of Fluorocarbons. Leak quantities were minute and were therefore not disclosed.

Material Flow for Group Companies

Third-party assured values are indicated with the  mark

INPUT	Units	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Total energy use	10 ⁹ MJ	1.61	1.53	1.62	1.68	1.70 
Sites (construction sites)	10 ⁹ MJ	0.37	0.29	0.39	0.32	0.37 
Factories	10 ⁹ MJ	1.10	1.12	1.10	1.23	1.20 
Offices	10 ⁹ MJ	0.14	0.13	0.12	0.12	0.13 
Total fossil fuel use	10 ³ kL	27	25	26	26	27 
Diesel	10 ³ kL	11	9	12	10	11 
Kerosene	10 ³ kL	2	2	2	3	3 
Heavy oil	10 ³ kL	12	12	11	11	11 
Gasoline	10 ³ kL	2	2	2	2	2 
GTL	10 ³ kL	—	—	—	—	0 
Total electricity use	10 ⁶ kWh	42	41	40	43	43 
Sites (construction sites)	10 ⁶ kWh	1	1	1	1	1 
Factories	10 ⁶ kWh	34	33	33	35	35 
Offices	10 ⁶ kWh	7	7	7	7	7 
City gas	10 ³ m ³	3,622	3,794	4,628	5,692	5,056 
LPG	t	92	63	378	485	575 
Water (consumption)	10 ³ m ³	132	153	115	138	109
OUTPUT	Units	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Total CO ₂ emissions	10 ³ t-CO ₂	101	95	100	101	102 
Sites (construction sites)	10 ³ t-CO ₂	26	19	27	22	25 
Factories	10 ³ t-CO ₂	67	68	66	72	70 
Offices	10 ³ t-CO ₂	8	7	7	7	7 
Total CO ₂ emissions	10 ³ t-CO ₂	101	95	100	101	102 
Scope1	10 ³ t-CO ₂	77	73	79	79	80 
Scope2	10 ³ t-CO ₂	23	21	20	20	19 
Scope3	10 ³ t-CO ₂	2	1	1	2	3 
NO _x	t	249	211	257	227	224
SO _x	t	109	106	107	103	105
Quantity of Chlorofluorocarbon and halon recovered	t	2	2	3	2	2
Total industrial waste generated	10 ³ t	352	259	266	485	416 
Quantity recycled	10 ³ t	333	248	256	475	406
Final disposal quantity	10 ³ t	19	11	10	10	10
Water (quantity discharged)	10 ³ m ³	121	143	109	74	76

Third-party Assurance of Environmental Data within the Taisei Group

Over the past five years, we have standardized and manualized the method of collecting and aggregating environmental data such as the quantity of energy consumed, the quantity of CO₂ emissions and the volume of industrial waste for the 7 main group companies participating in the Taisei Group Environmental Promotion Conference. In FY2020, continuing from the previous year, the 7 main group companies received third-party assurance for their actual performance data.

Among the group companies, TAISEI ROTEC CORPORATION, Taisei-Yuraku Real Estate Co., Ltd., and TAISEI HOUSING CORPORATION, were inspected by auditors visiting their head offices, major offices and factories.

Third-party assurance not only guarantees the data reliability but also leads to a review and improvement of the management structure and initiatives of each group company.

- The calculated total values may not be consistent with the total values due to data rounding.
- Third-party assured values are indicated with the  mark.

Calculation of Environmental index and Data

objective	Items	Calculation Method & Standard
Material flow-related	Classification by business type	Classification into civil engineering and building construction (sites), offices (excluding development projects and others), and factories
	CO ₂ emissions Scope classification	Scope1:CO ₂ emissions associated with the combustion of fossil fuels Scope2: Indirect CO ₂ emissions associated with the use of electricity, steam, and chilled and hot water Scope3: CO ₂ emissions associated with the transport of soil from construction (generated from off-site)
	CO ₂ emissions	Calculation standard Calculated based on in-house standards and the Taisei Group's environmental data calculation manual for the management of environmental information, complying with the Act on the Rational Use of Energy, the Act on Promotion of Global Warming Measures, the Waste Disposal and Public Cleansing Act, and the GHG Protocol, etc. In calculation of CO ₂ emissions, Taisei Corporation uses the value of the fuel consumption of the Japan Construction Mechanization Association, from which the fat content is excluded.
	NOx and SOx emissions	Calculation of NOx and SOx emissions originating from diesel, heavy oil, and kerosene. Calculated using the emission coefficient of the Architectural Institute of Japan's "Guide to Building LCA — Evaluation Tool for Measures against Global Warming, Resource Consumption, and Waste - Revised Version."
	[Offices and Factories] Energy-related and water consumption	Calculation standard Calculated based on in-house standards and the Taisei Group's environmental data calculation manual for the management of environmental information, complying with the Act on the Rational Use of Energy, the Act on Promotion of Global Warming Measures, and the GHG Protocol, etc. — Energy-related and water consumption — Offices and factories: The annual quantities purchased and used are calculated in monthly units. * Energy-related: Fossil fuels (heavy oil, diesel, gasoline, kerosene, GTL), electrical power, city gas, and LPG consumption and their energy-equivalent values.
	[Civil Engineering and Building Construction (sites)] Energy-related and water consumption	Calculation standard Calculated based on in-house standards and the Taisei Group's environmental data calculation manual for the management of environmental information, complying with the Act on the Rational Use of Energy, the Act on Promotion of Global Warming Measures, and the GHG Protocol, etc. — Energy-related and water consumption — Civil Engineering and Building Construction (sites): Consumption in a two-month period in FY2020 is sampled at 173 construction sites to calculate the consumption per unit of construction turnover (basic unit). Annual consumption is calculated by multiplying this basic unit by the construction turnover for the year. For civil engineering, this calculation is performed for each construction type. * Energy-related: Fossil fuels (heavy oil, diesel, gasoline, kerosene), electrical power, city gas, and LPG consumption and their energy-equivalent values.
	[Civil Engineering and Building Construction (sites)] Calculation of the main construction materials (concrete formworks and alternative formworks) purchased	— Amount of the main construction materials used: The quantities of the main construction materials directly through individual construction of Taisei Corporation and joint venture construction for which Taisei Corporation is the representative.
Prevention of global warming	Estimated CO ₂ emissions and CO ₂ reduction rate in the operation stage Calculated value based on the FY1990 standard Emissions per unit floor area	Calculated using the "Energy Efficiency Plan" for each of 65 projects, each with a total floor area of 300 m ² or more and with a total area of about 1,300,000 m ² , of Taisei Corporation building construction projects. — Energy Efficiency Plan: A plan that summarizes the measures for the efficient use of energy such as building thermal insulation and air conditioning facilities, which is required to be submitted when designing buildings with a total floor area of 300 m ² or more in accordance with the Act on the Rational Use of Energy.
	Results for adoption of green procurement items	Calculated the quantities based on the design specifications by Eco Sheet CASBEE introduced to buildings designed by Taisei Corporation
Resource recycling	Recycled amount	Total amount of sale of valuable resources, wide-area certification, self-disposal, and intermediate treatment
	Final disposal amount	Total amount of direct final disposal and intermediate processing residue
	Final disposal rate	(final disposal amount / amount arising) × 100 (excluding construction sludge and amount not attributable to Taisei Corporation)

- Organizations covered: the Taisei Group (Taisei Corporation, TAISEI ROTEC CORPORATION, Taisei-Yuraku Real Estate Co., Ltd., TAISEI U-LEC CO., LTD., TAISEI SETSUBI CO., LTD., TAISEI HOUSING CORPORATION, SEIWA RENEWAL WORKS CO., LTD., and J-FAST Co., Ltd.), which are all within Japan only. Environmental data cover more than 90% of the sales made by the entire Taisei Group.
- Calculation standard: Calculated based on in-house standards and the Taisei Group's environmental data calculation manual for the management of environmental information, complying with the Act on the Rational Use of Energy, the Act on Promotion of Global Warming Measures, the Waste Disposal and Public Cleansing Act, and the GHG Protocol, the Guide to Building LCA, etc. In calculation of CO₂ emissions, Taisei Corporation uses the value of the fuel consumption of the Japan Construction Mechanization Association, from which the fat content is excluded. Energy-related: Fossil fuels (heavy oil, diesel, gasoline, kerosene, GTL), electrical power, city gas, and LPG consumption and their energy-equivalent values.
- Third-party assured values (independent assurance report on p.22) are indicated with the  mark.

Independent Assurance Report



Translation

The following is an English translation of an independent assurance report prepared in Japanese and is for information and reference purposes only. In the event of a discrepancy between the Japanese and English versions, the Japanese version will prevail.

Independent Assurance Report

July 28, 2021

TO:

Mr. Yoshiro Aikawa
President and Chief Executive Officer,
Representative Director
Taisei Corporation

Kenji Sawami
Engagement Partner
Ernst & Young ShinNihon LLC

We, Ernst & Young ShinNihon LLC., have been commissioned by Taisei Corporation (hereafter the "Company") and have carried out a limited assurance engagement on the Key Environmental Performance Indicators (hereafter the "Indicators") of the Company, TAISEI ROTEC CORPORATION*, TAISEI U-LEC CO.,LTD*, Taisei-Yuraku Real Estate Co.,Ltd.*, TAISEI SETSUBI CO.,LTD.*, TAISEI HOUSING CORPORATION*, SEIWA RENEWAL WORKS CO.,LTD* and J-FAST Co., Ltd.* for the year ended March 31, 2021 as included in "Sustainability Activities (By Core Subjects of ISO 26000) The Environment" on the Company's website (hereafter the "Report"). The scope of our assurance procedures was limited to the Indicators marked with the symbol "E" in the Report.

1. The Company's Responsibilities

The Company is responsible for preparing the Indicators in accordance with the Company's own criteria, which it determined with consideration of Japanese environmental regulations as presented in the Report. Greenhouse gas (GHG) emissions are estimated using emissions factors, which are subject to scientific and estimation uncertainties given instruments for measuring GHG emissions may vary in characteristics, in terms of functions and assumed parameters.

2. Our Independence and Quality Control

We have met the independence requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is based on the fundamental principles of integrity, objectiveness, professional competence and due care, confidentiality, and professional behavior. In addition, we maintain a comprehensive quality control system, including documented policies and procedures for compliance with ethical rules, professional standards, and applicable laws and regulations in accordance with the International Standard on Quality Control 1 issued by the International Auditing and Assurance Standards Board.

3. Our Responsibilities

Our responsibility is to express a limited assurance conclusion on the Indicators included in the Report based on the procedures we have performed and the evidence we have obtained.

We conducted our limited assurance engagement in accordance with the *International Standard on Assurance Engagements: Assurance Engagements Other than Audits or Reviews of Historical Financial Information* ("ISAE 3000") (Revised) and, with respect to GHG emissions, the *International Standard on Assurance Engagements: Assurance Engagements on Greenhouse Gas Statements* ("ISAE 3410"), issued by the International Auditing and Assurance Standards Board.

The procedures, which we have performed according to our professional judgment, include inquiries, document inspection, analytical procedures, reconciliation between source documents and Indicators in the Report, and the following:

- Making inquiries regarding the Company's own criteria that it determined with consideration of Japanese environmental regulations, and evaluating the appropriateness thereof;
- Inspecting relevant documents with regard to the design of the Company's internal controls related to the Indicators, and inquiring of personnel responsible thereof at the headquarter and sites (1 construction site, 1 office and 1 factory);
- Performing analytical procedures concerning the Indicators at the headquarter and sites (1 construction site, 1 office and 1 factory);
- Testing, on a sample basis, underlying source information and conducting relevant re-calculations at the headquarter and sites (1 construction site, 1 office and 1 factory);

The procedures performed in a limited assurance engagement are more limited in nature, timing and extent than a reasonable assurance engagement.

As a result, the level of assurance obtained in a limited assurance engagement is lower than would have been obtained if we had performed a reasonable assurance engagement.

4. Conclusion

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes us to believe that the Indicators included in the Report have not been measured and reported in accordance with the Company's own criteria that it determined with consideration of Japanese environmental regulations.

* CO₂ emissions, energy use, fossil fuel use, electricity use, city gas, LPG, industrial waste emissions only