Environmental Management System

We are working to improve our environmental performance by formulating strategies across the company and proactively working to solve problems based on our Environmental Management Policy.

Basic Approach

Our environmental management policy declares an active commitment to environmental issues facing society, including not only preventing environmental pollution but also building circular economies, delivering carbon neutrality, reducing environmental impacts, protecting water resources and conserving biodiversity as key management challenges. Under this policy we are striving to improve our environmental performance.

Environmental Management Policy

In January 2006 we formulated our Environmental Management Policy, reflecting the fact that we consider an active commitment to the environmental issues facing society to be key management challenges. In addition to initiatives emphasizing the six items in all business operations, we strive to communicate with a wide range of stakeholders, from international society to local communities, and to seek the ideal form for a sustainable cement industry as a member of the GCCA (Global Cement and Concrete Association) and the UNGC (United Nations Global Compact).

1. Pursuing Environmentally Conscious Business Activities
2. Compliance with Environmental Laws and Regulations
3. Contribution to the creation of Circular Economy
4. Efforts to achieve Carbon Neutrality
5. Promoting Global Technology Transfer
6. Ecosystem Conservation

Formulated in January 2006
Revised in April 2023

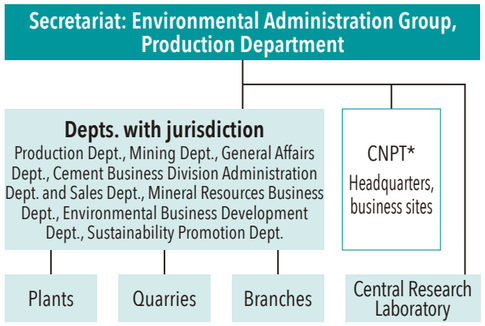
Structure and Operation

We have established an Environmental Management Committee chaired by the officer in charge of the Production Department as one of the specialized committees under the Sustainability Management Committee, which reports directly to the Board of Directors, to promote environmental management and implement the Environmental Management System (EMS).

Company-wide EMS Readiness

In June 1997, we initiated ISO 14001 certification of each of our plants and attained certification of all six of our directly operated plants by 1999. In April 2009, we established a company-wide EMS that extends the scope of application not only to plants but also to the headquarters, branch offices, and central research laboratory, and received ISO 14001 certification registration from the Japan Testing Center for Construction Materials. The company-wide system underwent a renewal audit for the fourth time in March 2021, and from April 2021 the certification was renewed with the Tosa Office added to the scope.

● Company-wide EMS Readiness



* The Carbon Neutral Technology Development Project Team

All of our cement plants in Japan, including those of group companies, have obtained ISO 14001 certification. Furthermore, all of our overseas cement plants in countries that adopt ISO have obtained ISO 14001 certification and are actively committed to environmental conservation. Cement plants in countries where ISO is not adopted as the mainstream standard operate their own EMS.

Internal Environmental Audits

We conducted internal environmental audits at all our sites in FY2023.

As priority items from this year's audit, confirmation of compliance reviews regarding environmental laws and other requirements, external communications and corrective actions for unachieved items were identified. The status of a follow-up, including corrective and preventive actions for nonconformity with environmental requirements, and the status of responses to emergencies were identified as items that plants must deal with. Verifying the compliance status of service stations was implemented as an item that must be dealt with by branches. The audit identified 29 findings, and corrective actions were taken for all three findings for which improvements were requested.

Environmental Education

During Environment Month each June we deliver a message from the president and provide educational materials on the environment page of our portal site to increase awareness and encourage learning about the environment, and about environmental preservation activities throughout Taiheiyo Cement Corporation and group companies. Each workplace also engages in a number of different activities, such as conducting training sessions related to accident response, viewing environment-related videos, holding lectures and taking part in local cleanup activities. In FY2023, more than 340 activities took place.

Training to respond to environmental accidents (Kumagaya Plant)

Status of Compliance with Environmental Laws

Environmental Accidents

In FY2023, we had four minor accidents and have taken measures to prevent their recurrence. There were no violations of environmental laws that could result in fines or penalties, nor were there any major accidents that would have an effect on the environment or ecosystems.

Response to Environmental Accidents

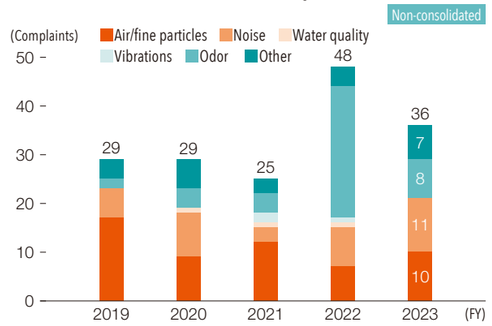
Each plant maintains emergency response plans in preparation for possible environmental accidents. They also conduct periodic fire-fighting drills in cooperation with local fire departments. Other training includes how to reduce environmental impact when an environmental accident occurs, and how to report it to a government entity.

Environmental Complaints

As we increasingly utilize ever more diverse forms of waste and by-products the number of environmental issues we need to consider also increases. Therefore, we are ramping up our efforts to reduce environmental impact through activities such as introducing indoor storage and sealed containers for waste and by-products, and improving our flue gas stacks. On receiving an environmental complaint, whenever possible we quickly travel to the site in question to check the situation, investigate the cause and provide an explanation. If we find that our activities are the cause we implement improvements.

In FY2023, we received 109 environmental complaints, including those from outside sources. We responded to 36 of these, which were associated with our operations.

● Number of Environmental Complaints Received



Mitigating Climate Change

Promoting measures to reduce CO_2 emissions from a medium- to long-term perspective to contribute to the prevention of global warming and for sustainable growth.

Basic Approach

A significant amount of CO_2 is generated during cement production. This is because the production process requires a high temperature of 1,450°C and limestone, used as a raw material, is decarbonated through a chemical reaction during the calcination process ($CaCO_3 \rightarrow CaO + CO_2$). In 2015, we therefore set in the CSR Objectives for 2025 a target for Taiheiyo Cement Corporation and our group companies of reducing specific net CO_2 emissions by 10% or more from 2000 levels. In March 2022, we announced "2030 Interim Targets" towards carbon neutrality, and set targets of reducing emissions intensity by 20% or more throughout the supply chain and reducing total (domestic) CO_2 emissions by 40% or more (each compared to 2000).

Efforts Related to CO_2 Emissions Reduction in the Cement Production Process

Progress of the Group's CO_2 Emissions Reduction Targets

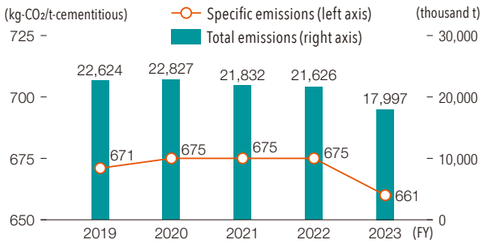
Indicators		Target (compared to 2000)	Performance FY2022	Performance FY2023	Progress and Evaluation
CSR Objectives for 2025 Reduction rate of specific net CO_2 emissions*1:		**10% or more**	8.3%	10.2%	Improved by 1.9% from FY2022 due to increased ratio of alternative fuels use
2030 Interim Target	Reduction rate of specific CO_2 emissions across the supply chain*2:	**20% or more**	9.6%	9.2%	Decreased by 0.4% from FY2022 due to an increase in Scope 2 and Scope 3 specific emissions due to clinker purchases, as a result of the renovation of the production line at Taiheiyo Cement Philippines, Inc.
	Reduction rate of total (domestic)* CO_2 emissions*3:	**40% or more**	36.0%	42.7%	Emissions decreased due to an increase in the ratio of alternative fuels used and decreased cement production, resulting in a 6.7% improvement from FY2022.

*1 Scope 1 (excluding alternative fossil energy and CO_2 resulting from on-site power generation)
*2 Scope 1 (excluding alternative fossil energy) + Scope 2 + Scope 3 (Category 1,3)
*3 Scope 1 (excluding alternative fossil energy) + Scope 2

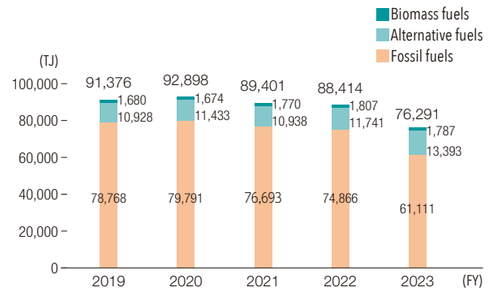
Trend in CSR Objectives for 2025

In order to reduce CO_2 emissions, we have been working to conserve energy by installing energy-efficient equipment and improving the stability and efficiency of our kiln operations. We have also been implementing measures such as expanded use of waste- and biomass-derived energy sources to decrease our rate of use of fossil fuels. As a result of these efforts, specific net CO_2 emissions in FY 2023 were 661 kg/t-cementitious product, achieving our FY2026 specific emissions target of 662 kg/t-cementitious product.

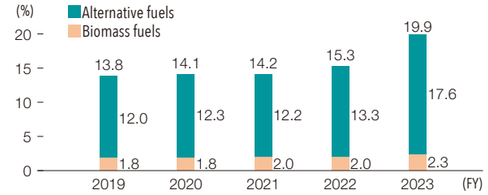
Specific Net CO_2 Emissions GCCA



Total Heat Consumption for Clinker Production GCCA



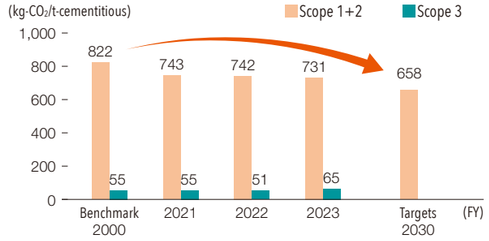
Ratio of Alternative Fuels and Biomass Fuels GCCA



Trend in direct specific CO_2 emissions across the supply chain

Scope 3 (category 1) specific emissions increased due to the renovation of the production line at Taiheiyo Cement Philippines, Inc. and due to clinker purchases. There was a steady decline in Scope 1+2 emissions, with an 11.0% reduction from 2000 levels.

Specific CO_2 emissions in the supply chain GCCA

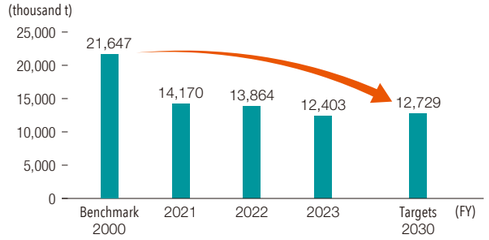


Trend in Total Domestic CO_2 Emissions

Total CO_2 emissions from cement plants (Scope 1+2, but excluding alternative fuels) have decreased significantly compared to 2000 (our benchmark year). This is due to decreased coal use via an increase in alternative fuels and a decrease in cement production.

Regarding the reduction of total domestic CO_2 emissions by 40% or more (compared to 2000), which is one of our 2030 Interim Targets, the reduction rate was 42% in FY2023, exceeding the interim target.

Total Domestic CO_2 Emissions GCCA



Reducing CO_2 Emissions during Transportation

We contract the delivery of our raw materials, fuels and products to transportation companies, and are striving to reduce CO_2 emissions as a specified consigner designated under the Act on Rationalizing Energy Use. In trucking, we encourage not only the installation of digital tachometers on vehicles, but also the planning of transporting goods on return trips, eco-driving and energy efficient devices such as digital eco-tires. In shipping, we operate new ships that are equipped with various energy-saving features. We are also supporting energy-saving operations for conventionally powered ships.

Our FY2023 CO_2 emissions were roughly 3% lower than in FY2022.

CO_2 Emissions by Mode of Transportation (FY2023)

Non-consolidated

Mode of Transportation	Tonnage transported (thousand t)	Average distance transported (km)	Transported tonne-kilometers (thousand tkm)	CO_2 emissions (thousand t)
Ship	17,726	447	7,920,429	105
Truck	14,879	56	828,317	47
Railway	4,877	26	127,505	3
Total	37,482	252	8,876,251	155

Improving Resource Efficiency

Promoting the recycling of waste and by-products into alternative raw materials and fuels for cement. Through this, we are promoting the formation of a circular economy from the perspective of prolonging the life of landfills and preventing the depletion of natural resources.

Resource Recycling with Industries

Electric power utilities

We accept coal ash produced at coal-fired power plants and use it as a substitute for clay as a raw material in cement. In addition, we operate ash centers to use more ash effectively. We also supply power plants with limestone powder which is used to scrub the harmful sulfur oxides from the exhaust produced by the burning of coal. The reaction of the limestone powder with sulfur oxides forms by-product gypsum, which we make effective use of as a raw material for cement.

Steelmakers

In the iron and steelmaking process, impurities are removed from iron ore to make iron. We supply the limestone and quicklime used in the refining process. We also use blast furnace slag, a by-product that remains after the refining process, as raw materials for cement and as cement admixtures.

Resource Recycling with Local Communities

In addition to industrial waste, we also use general waste generated by local governments, municipal waste incineration residues, water purification sludge and sewage sludge as raw materials and fuel to manufacture cement. The total amount of waste generated in Japan in FY2022 was 40.95 million tonnes, of which approximately 77% was incinerated, and 3.62 million tonnes of unused incineration residues were buried in landfill sites.

The Group's systems for recycling municipal waste that meet the needs of society include the Incineration Residues Recycling System, the AK System and the Ecocement System. We use the set of these three technologies related to systems for recycling municipal waste and strive to make effective use of such resources and resolve environmental issues.

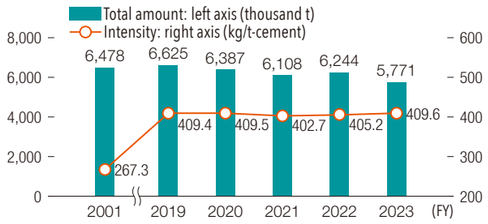
Recycled-Waste-to-Cement System

All of our directly operated cement plants in Japan recycle waste and by-products into alternative raw materials and fuels for cement. This helps to prolong the life of landfills, prevent the depletion of natural mineral resources, limit greenhouse gas emissions and reduce emissions of pollutants into the atmosphere.

In FY2023, the amount of waste and by-products used decreased by 473 thousand tonnes from the previous fiscal year due to a decrease in cement production, but the amount of dirt, sludge, waste plastic and municipal waste incineration residues that was accepted increased.

Trends in Amount and Intensity of Waste and By-products Used

Non-consolidated



Amount and Intensity of Main Waste and By-products Used (FY2023)

Non-consolidated

Waste and By-products	Amount used (thousand t)	Intensity (kg/t-cement)
Coal ash	1,820	129.2
Blast furnace slag	991	70.3
By-product gypsum	514	36.4
Unburned ash, dust	471	33.4
Dirt and sludge	367	26.0
Construction waste	148	10.5
Waste oil	148	10.5
Wood chips	19	1.4
Waste plastic	221	15.7
Water treatment plant sewage sludge and ash	350	24.8
Incineration residues from municipal waste	147	10.4
Municipal waste	19	1.3
Other	557	39.5
Total	5,771	409.6
Raw material-related	5,212	369.9
Fuel-related	559	39.7
Total	5,771	409.6

Waste and By-products Used in Cement Manufacturing Processes

Examples of Waste and By-products Used

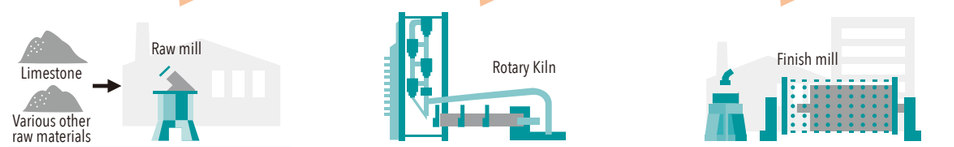
Raw materials
Coal ash, blast furnace slag
Dirt and sludge
Non-ferrous slag
Steelmaking slag
Construction soil
Molding sand

Raw materials
Incineration residues from municipal waste
Household water and sewage treatment sludge

Fuels
Waste oil, waste plastic
Waste tires, wood chips
RDF (municipal waste pellets)
Recycled oil

By-product gypsum
FGD gypsum
Chemically derived gypsum

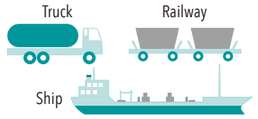
Admixtures
Slag powder
Fly ash



Raw Material Preparation Process
Limestone, iron waste, etc. are mixed together, dried and ground in a raw mill.

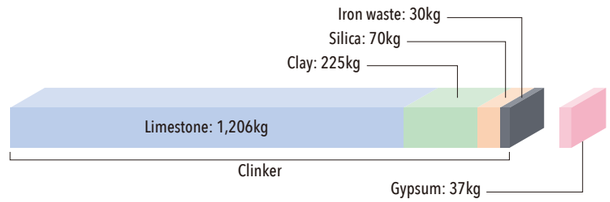
Burning Process
After preheating, the materials are burned in a rotary kiln. The resultant material is then rapidly cooled to form an intermediate product called clinker.

Finishing Process
A small amount of gypsum is added to the clinker and ground in the finish mill to produce cement.



Transportation
The cement is then transported by ship, truck or railway.

Reference: Resources required to produce one tonne of cement



Data source: The Japan Cement Association

Reducing Environmental Impact

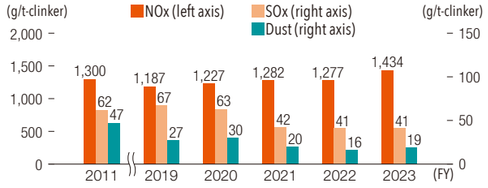
Air pollutants generated from cement production are primarily NOx, SOx and dust in combustion gases emitted from cement kilns.
To ensure the appropriate management of these substances, we are striving to ensure proper operations through measures such as continuous monitoring of emission concentrations in exhaust gases.

Preventing Environmental Pollution

Air Pollution

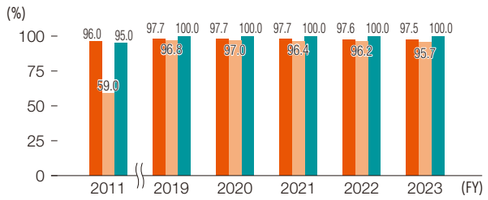
Air pollutants generated from cement production are primarily NOx, SOx and dust in combustion gases emitted from cement kilns. To ensure the appropriate management of these substances we strive to reduce air pollutant emissions through measures such as installing equipment to continuously monitor emission concentrations, improving NOx reduction systems and installing bag filter equipment to capture dust emissions. Our target is to maintain our FY2011 emissions levels. The details regarding emissions are provided in ESG Data (p. 118).

Specific Emissions of Clinker for Main Pollutants GCCA



* Calculation results were reviewed and retroactively revised.

Monitoring Rate GCCA



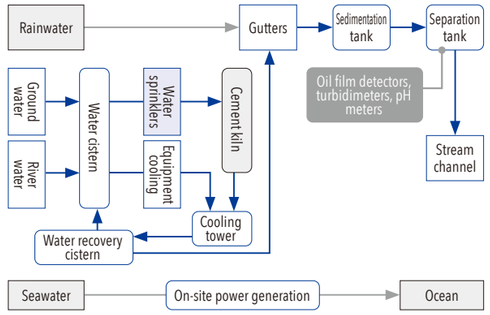
Percentage of clinker volume manufactured in a kiln equipped with continuous NOx measurement
Percentage of clinker volume manufactured in a kiln equipped with continuous SOx measurement
Percentage of clinker volume manufactured in a kiln equipped with continuous dust measurement

* Calculation results were reviewed and retroactively revised.

Water Contamination

Most of the water discharged from our plants to public watercourses is cooling water and not polluted as defined in the Water Pollution Control Act. At our cement plants all water resources are reused as circulation water to minimize water discharge into public watercourses. Moreover, we are taking measures to prevent the leakage of contaminants by installing bunds around oil tanks and acid/alkali tanks, as well as installing sedimentation tanks, water-oil separation tanks, oil film detectors, pH meters and suspended solid sensors on water discharge routes that connect to public waters.

Example of Water Circulation Flow at a Cement Plant



Soil Contamination

Across FY2008 and FY2009, we evaluated the risks associated with cement plants that may be sited on contaminated ground by appointing an expert consultant to undertake a soil history survey, conducted drilling surveys, and verified whether or not the soil is contaminated. Actions have been taken as necessary based on the findings, such as the installation of observation wells to monitor ground water contamination and the removal of contaminated soil.

We are also working to eliminate the possibility of soil contamination via measures to prevent the leakage of wastewater from scrapyards or fluid from oil tanks, acid/alkali tanks, pipes and so forth.

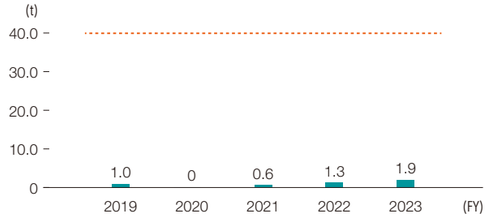
Reducing Waste

Initiatives at Plants

Our cement plants reduce the amount of waste handled by disposal contractors by reusing waste from operations as raw material for cement production. We also endeavor to reduce waste that ultimately ends up in landfill via measures such as the use of chromium-free kiln bricks.

In FY2023, there was 1.9 tonnes of waste, compared to the target of 40 tonnes or less.

Volume of Waste to Landfill at Plants Non-consolidated

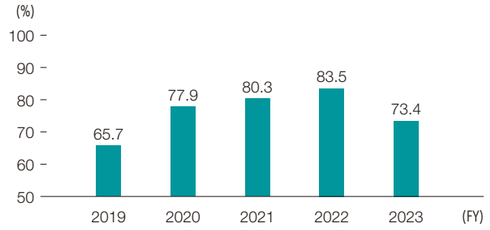


Initiatives at Service Stations

Service stations (SS) reduce the waste handled by waste disposal contractors by returning any residual cement that remains in silos after switching the cement products. Returned cement is recycled as raw material.

In FY2023, the recycling rate was 73.4%, compared to the target of 50%.

Recycling Ratio Non-consolidated



Appropriate management of chemicals

Pollutant Release and Transfer Register (PRTR)

The PRTR Law requires that we report on equipment installed at our Kumagaya plant for the washing of municipal waste incineration residues. This washing process uses water, and our total discharge of dioxins and ferric chloride into public waterways in FY2023 are as shown below.

Reported Levels of Dioxins and Ferric Chloride Emissions Non-consolidated

Emissions	Reported Levels		
	FY2021	FY2022	FY2023
Dioxins (mg-TEQ)	0.0	0.0	0.0
Ferric chloride (kg)	170	198	186

Management of PCB Waste

We properly store and dispose of high and low concentrations of PCB waste in accordance with the Amendment to the Law concerning Special Measures for Promotion of Proper Treatment of PCB Wastes (hereinafter referred to as the PCB Special Measures Law).

For high-concentration PCB waste with an early disposal deadline as stipulated by the PCB Special Measures Law, we signed a processing contract with the Japan Environmental Safety Corporation (JESCO) in 2006 and have prioritized processing.

In FY2023, one capacitor, one transformer and 1,110 electrical ballasts stored at the Kamiiso Plant, Ofunato Plant, Kumagaya Plant, Saitama Plant, Fujiwara Plant, former Chichibu Plant, former Kawara Plant, Garo Quarry and branch office service stations were processed, as well as three unprocessed capacitors that were in the Kyushu, Chugoku and Shikoku area.

Pollutants such as electrical ballasts stored at the former Osaka Plant and former Kawara Plant are planned for processing in FY2024, and we are scheduled to complete the processing of all high-concentration PCB waste.

Treatment of High-concentration PCB Waste Non-consolidated

(Unit: No. of machines)

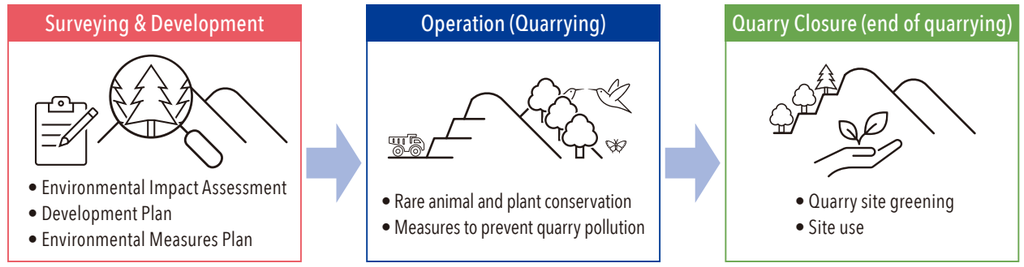
Waste	Stored in FY2022 (as of March 31, 2022)	New Targets for FY2023	FY2022 processing results	Treated in FY2023	Treatment Scheduled for FY2024
Capacitors	4	0	4	0	0
Transformers	1	0	1	0	0
Electrical ballasts	948	168	1,110	6	6
Total	953	168	1,115	6	6

Conserving and Restoring biodiversity

**We recognize that our quarrying activities are most closely related to biodiversity.
We are aiming to achieve nature positive by working with local communities, from the development and operation of quarries through to the use of old quarry sites.**

Environmental Impact of Quarry Operations

Throughout the group we believe that balancing the conservation of ecosystems in local communities and development of the communities themselves are important in quarry operations. With this belief, we hold discussions with local governments, local communities and academics while operating quarries. This helps to ensure we not only prevent pollution but also conserve biodiversity and water resources while minimizing our environmental impact.



Reducing Environmental Impact

Cement production starts with quarrying limestone, the primary raw material for cement. We also quarry many mineral resource products used as aggregates and industrial raw materials. Because forests are cleared, topsoil is excavated and limestone is extracted at a quarry, it inevitably affects the environment and ecosystem of the quarry's area. However, because the limestone, sand and other materials that we quarry only require crushing for particle size adjustment and sorting, our operations are unlikely to cause chemical contamination to surrounding areas. In addition, we minimize the amount of waste stones generated during our limestone quarrying by using them as construction materials.

Kanamaru-Maimai (provided by Mie Prefecture Environmental Conservation Agency)
One of the rare species of wild animals and plants designated by Mie Prefecture for which conservation activities are being promoted at Fujiwara Quarry.

Limestone Quarries of the Group

The group operates 19 major limestone quarries around the world, which are located near to our cement plants, with a total site area of 5,355 ha.

Based on the GCCA guidelines, and using the Integrated Biodiversity Assessment Tool (IBAT) provided by BirdLife International, we checked if any of our group's limestone quarries are in any of the protected areas defined by the International Union for Conservation of Nature (IUCN) and conducted a biodiversity assessment.

Two quarries in Japan are included in areas of biodiversity value*, and none overseas. All these quarries have obtained the necessary licenses from their local governments and conduct environmentally sound quarrying operations. Greening at former quarry sites is being implemented in accordance with plans for environmental restoration. They have no pending litigation concerning biodiversity or other environmental issues.

● Limestone Quarries of the Group GCCA

Region	Quarries	Site area (ha)	Applicable* quarries
Japan	13	2,835	2
United States	4	1,903	0
Asia-Pacific	2	617	0
Ratio of quarries with rehabilitation plans (%)			95

* A protected area whose purpose is to conserve habitat mainly through management activities. Includes IUCN Category IV (habitat or species management area) Protected Areas.

Activities to Reduce Environmental Impact

Environmental Impact Assessment

Throughout the group we believe that balancing the conservation of ecosystems in local communities and development of the communities themselves are important in quarry operations. In developing quarries, we conduct ex-ante assessments of environmental impact of quarry developments with the cooperation of experts, based on environmental research of the development area such as on biodiversity and water resources. We then discuss the results of the research with stakeholders before finalizing a development plan. Moreover, we regularly monitor the surrounding environment during the development and operations of quarries, and report to our stakeholders on the environmental impact that the quarries have in their areas.

Participation in the 30by30 Alliance

We contribute to the realization of Nature Positive as advocated by TNFD*1 through biodiversity initiatives, conduct our business activities based on our management philosophy, and promote the conservation of rare flora and fauna in limestone quarries related to biodiversity and the greening of quarrying areas and former sites.

From FY2024, we will participate in the "30 by 30 Alliance for Biodiversity" established by the Ministry of the Environment, aiming to be registered in the OECM*2 database.

30by30 refers to the target of preserving at least 30% of terrestrial and marine areas as healthy ecosystems by 2030. Achieving this target in each country was promised at the 2021 G7 Summit.

*1 Abbreviation for Taskforce on Nature-related Financial Disclosures.
*2 Abbreviation for Other Effective area-based Conservation Measures. It refers to areas that are being conserved through private and other initiatives, and areas where management that is not aimed at conservation also results in contributing to the protection of the natural environment.

Biodiversity Protection

When environmental impact assessments determine that protection is required at a limestone quarry that we own, we protect rare species via measures such as installing protective equipment, transplanting and restricting development work.

Chichibu Taiheiyo Cement Corporation is actively involved in the conservation of rare plants. At Kanouyama Quarry located in Kanna Town, Tano District, Gunma Prefecture, 38 rare plants native to the quarry have been transplanted into a botanical garden set up in the mine with the cooperation of a local nature conservation group. At the same company's Miwa Quarry, which is conducting quarrying on Mt. Buko, located in Chichibu City and Yokoze Town in Saitama Prefecture, we are preserving and increasing the population of 68 native plant species together with local experts and using the Central Research Laboratory's biotechnology.

At the Fujiwara Quarry of Mie Taiheiyo Mining Company (formerly Ishizaki Co., Ltd.), we have been engaged in conservation activities since 2012, including transplantation and post-event surveys, in cooperation with experts, for the Kanamaru-Maimai, a Mie Prefecture-designated rare animal species that is found in the limestone area around Mt. Fujiwara.

Iwakinbai
(Kanouyama Quarry)

Oobiranji
(Kanouyama Quarry)

Appropriate use of water resources

In our use of water resources we are striving to analyze water risks and understand the status of water use as issues that may emerge in the future, and are working to ensure the proper use of water resources.

Appropriate use of water resources

Water Risk Analysis

According to the results of the water risk analysis conducted using the Water Risk Filter*, the average score for the total basin risk for all our plants (weighted average taking into account the cement production volume) was 2.4. The highest total basin risk score was 2.8, which was 0.4 lower than that of the previous year. The volume of cement produced at the plant in question accounted for about 17.6% of the production volume of all the plants. However, when we analyzed conditions at that plant, no urgent issues were identified.

* A water risk mapping tool developed by the World Wide Fund for Nature (WWF). It is used to evaluate business impacts related to physical risks such as water scarcity and water quality. The maximum score is 5.0, and the higher the score, the greater the risk.

Water Consumption

Most of the water used at our cement plants is for the cooling of production equipment, exhaust gas and on-site power generators. Therefore, the water discharged from the plants is mostly cooling water, which is not polluted as defined in the Water Pollution Control Act. All the fresh water used at the plants is circulated and reused, except for the household wastewater, as we strive to reduce our water withdrawal and lessen the impact of wastewater on bodies of water. Seawater is used to cool on-site power generation facilities at our plants near the ocean and then released back into the sea after use.

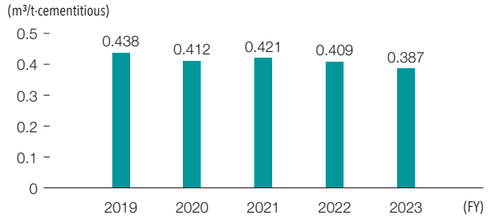
Our total fresh water used in FY2023 was about 11.86 million m³ and our fresh water used to produce one tonne of cement was 0.387 m³. However, most of this water is not used as a raw material and evaporates after being used to cool equipment or gas.

● Water Consumption GCCA

(Unit: thousand m³)

	FY2019	FY2020	FY2021	FY2022	FY2023
Surface water	6,521	5,626	5,355	5,527	5,346
Ground water	16,884	18,656	18,759	18,706	17,673
Industrial water	3,251	3,325	3,078	2,108	1,630
Total fresh water withdrawal (I)	26,656	27,607	27,192	26,341	24,649
Total seawater withdrawal	149,776	147,372	146,232	146,894	145,476
Total water withdrawal	176,432	174,979	173,424	173,235	170,125
Total fresh water discharge (O)	12,167	13,674	13,447	13,246	12,792
Total seawater discharge	149,781	147,377	146,368	147,062	145,639
Total water discharge	161,948	161,051	159,815	160,308	158,431
Total fresh water used (I-O)	14,489	13,933	13,745	13,095	11,857

● Amount of Fresh Water consumption per unit of production GCCA



Appropriate Use of Water Resources

At present there are no specific concerns regarding water resources that may be raised by local communities. However, we are striving to reduce water withdrawal with a view to conserving water resources. In the future, we will maintain close communication with local communities and contribute to the appropriate use of local water resources.

Taiheiyo Cement Philippines, Inc. supplies clean water to local communities from wells drilled by the company for water to use in its plants. At CalPortland Company's Rocky Canyon Aggregate Quarry in California, USA, a system for the sustainable use of water has been built to improve the collection and storage of rainwater and spring water at the site. Developing these water resources has made it possible to secure a supply of the water it needs in its work, without having to build new wells or increase the volume of ground water it extracts, and also to keep the amount of water that drains out of the site, which is subject to strict regulations, to a bare minimum.

System for the sustainable use of water (CalPortland Company)

Water Resource Conservation

In quarrying we also pay close attention to protecting not only terrestrial animals and plants but also water resources such as rivers and natural springs. From the perspective of conserving water resources, spring water and rainwater is discharged from quarrying after treatment to minimize impact on the environment outside of the quarrying area by passing through regulatory pond. In some quarries we drill wells for domestic water and supply this water to local communities for everyday use.

Disclosure Regarding Recommendations of the TCFD

We announced our support for the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) in June 2019 and have been performing scenario analysis since then. Following the Glasgow Agreement at COP26 in November 2021, we have conducted scenario analysis using 1.5°C and 4°C as the CO_2 reduction scenarios applicable to us.

Setting Scenarios

We focused our scenarios, evaluation and analysis on the business risks and opportunities that climate change will pose to the Group by the year 2050. We identified events that will materially impact climate-related risks and opportunities, based on climate-related, long-term scenarios founded on science, such as the World Energy Outlook (WEO) and Energy Technology Perspectives (ETP) published by the IEA and The Fifth Assessment Report (AR5) published by the IPCC. Then we created two climate-related scenarios, 1.5°C and 4°C, that will have impact on the business operations of the Group, along with appropriate carbon price assumptions for the 2030s using the IEA World Energy Outlook 2021 as a reference.

To follow up, we analyzed the business impacts in every scenario by size and time horizon (short, medium and long).

Process of Selecting Material Climate-related Risks and Opportunities and Scenarios

- STEP 1: Conduct a benchmark survey to identify climate-related risks and opportunities for the cement industry and identify relevant drivers
- STEP 2: Determine the causal relationships between climate-related drivers, interim outcomes and implications. Then identify key drivers
- STEP 3: Create climate-related scenarios for each key driver, referring to the published climate-related long-term scenarios that were developed based on scientific grounds
- STEP 4: Evaluate the anticipated business impacts in each scenario
- STEP 5: Review responses to the business impacts, which are, in our view, positively or negatively significant in our evaluation

	1.5°C scenario (consistent with the Paris Agreement)	4°C scenario (ineffective response to climate change)
Reference Scenarios	IEA net-zero Emissions Scenario (NZE) Carbon Emissions Pathway: RCP 2.6	IEA Stated Policies Scenario (STEPS) Carbon Emissions Pathway: RCP 8.5
Assumed Carbon Price	US$130 (approx. 17,550 yen)/tonne-CO_2	US$30 (approx. 4,050 yen)/tonne-CO_2

Scenario Overview

1.5°C Scenario	4°C Scenario
Government and industry are working together toward carbon neutrality. Development consistent with the industry's transition to carbon neutrality (CO_2 capture, utilization and storage technologies) is progressing. The effects of climate change are being addressed to a certain extent through national resilience policies and other measures.	There is a mismatch between our efforts towards carbon neutrality and the regulations applicable to the cement industry, which would put us at a competitive disadvantage. Profits from the development of the innovative technologies that we promote are limited. In addition, the effects of climate change are becoming more severe, such as frequent extreme climatic events.

● Business Impact

Category	Drivers	1.5°C Scenario		4°C Scenario	
		Negative	Positive	Negative	Positive
1. Policy and Regulatory	• Introduction of regulated carbon pricing Tighter CO_2 emission regulations		M	M	
2. Market	• Soaring fossil energy prices	S		M	
	• Increased demand for low-carbon construction materials		L		M
	• Reduced operation of coal-fired thermal power plants	M		S	
3. Technologies	• Progress in the development of CO_2 capture and utilization technology		L	M	
	• Improved technologies for resource recycling and advanced circular economies		M		S
4. Reputation	• Increased awareness of delivering carbon neutrality		M	M	
5. Physical events	• Chronic - Higher average temperatures, higher sea levels	S	S	M	S
	• Acute - Intensification of climatic events (e.g., flooding, high temperatures)	S	S	L	S

[L](Large): Impact of about 100 billion yen in terms of net sales
[M]Medium: Impact of about 1-10 billion yen in terms of net sales
[S]Small: Impact up to about 1 billion yen in terms of net sales

Providing Environmentally Sound Products and Services

In response to social needs for environmental conservation, we leverage the advantages of the cement and related technologies we have cultivated over the years to provide environmentally sound products and services that contribute to resource conservation and CO_2 reduction.

Low-CO_2 emission limestone-blended cement "ADVANCEMENT"

Our U.S. group company, CalPortland Company, has launched a new product series called ADVANCEMENT, which is a blend of Portland cement and limestone. By replacing up to 15% of clinker with limestone ADVANCEMENT is a low-CO_2 emission product that can reduce CO_2 emissions by approximately 10% compared to ordinary Portland cement as specified by ASTM C150.

ADVANCEMENT TYPE 1L complies with ASTM C595 and AASHTO M240 and is also certified by the California Department of Transportation, allowing it to be widely used in infrastructure construction, including highways. Following test marketing in 2021, CalPortland Company will gradually switch from ordinary Portland cement (TYPE II/V) produced at its Mojave Plant to ADVANCEMENT TYPE 1L. Approximately 1.2 million tonnes of ADVANCEMENT will be produced annually, reducing CO_2 emissions by approximately 95,000 tonnes. ADVANCEMENT LT is light-colored and aesthetically pleasing while maintaining the low-CO_2 emission performance, and can be used in applications to meet the aesthetic expression of architects and designers. In addition, ADVANCEMENT HS is suitable when particularly high sulfate resistance is required. In this way, ADVANCEMENT is a series of low-CO_2 emission cement products that are tailored to the application and performance requirements.

ADVANCEMENT delivery trucks

Thermal Insulating Paving Blocks "Thermalbarrier ILB"

At Taiheiyo Precast Concrete Industry, we sell "Thermalbarrier ILB," which are paving blocks that suppress the absorption of heat from solar radiation, thereby reducing the rise in temperature and heat retained in the road surface, and mitigating the hot environment in pedestrian and roadside areas. The surface layer of this block is made of material that is highly effective in reflecting near-infrared radiation, and the base layer is made of concrete with cavities to reduce the absorption and retention of heat from solar radiation. This contributes to limiting the heat island effect by reducing not only the daytime hot environment but also heat radiation at night.

The performance of the Thermalbarrier ILB was confirmed to be effective in reducing road surface temperature by 11.5°C or more in a comparison test with asphalt pavement conducted by the Japan Interlocking Block Pavement Engineering Association, and has been certified as "COOL BLOCK PAVE". In addition to its excellent thermal insulation performance, the Thermalbarrier ILB series also includes a product that, depending on the specifications of the base concrete layer, provides the block itself with water retention performance and permeability to allow rainwater to permeate into the roadbed. This product also effectively uses crushed roof tiles, molten slag produced in the cooling process after incineration of municipal waste, and glass cullet made from processed wine bottles, which would normally be disposed of as industrial waste, as recycled aggregates.

Recently, Thermalbarrier ILB has been widely used in construction projects, such as Oi Central Seaside Park Sports Forest and Kumagaya Sports Culture Park in Saitama Prefecture.

Construction example: Thermalbarrier ILB laid around the rugby field at Kumagaya Sports Culture Park, Saitama Prefecture

External economic benefit (EEB)

We evaluate the socioeconomic benefits from environmental impact reduction due to increased recycling of waste in monetary terms.

Basic approach

We use the external economic benefit (EEB) evaluation method with our Recycled-Waste-to-Cement System to express, in monetary terms, our evaluation of the socioeconomic benefits from environmental impact reduction due to increased recycling of waste accepted from outside the company. We calculate that we created a social benefit of 87.2 billion yen in FY2023. The reduction in the amount of natural resources, waste and by-products in FY2023 decreased from the previous fiscal year, leading to an approximate 4% reduction in economic benefit on the previous fiscal year.

Taiheiyo Cement's External Economic Benefit Evaluation

- We have developed a unique evaluation method to estimate the overall environmental benefit to society by utilizing waste materials from other industries.
- We use information, including data collected for the GCCA Cement CO_2 Protocol, to calculate the reduction in consumption of fossil energy and natural resources associated with the use of waste and by-products.
- Economic benefits are calculated by multiplying reductions in consumption (effects of environmental conservation) by set market prices. The market values of the inventory items are set at FY2001 levels, and are estimated on the basis of the following considerations.
  CO_2: 3,000 yen/tonne (a hypothetical CO_2 emission tax rate).
  Crude oil: import price. Natural resources: estimated price.
  Waste: controlled landfill costs in the Tokyo area.
- A portion of the EEB is accounted for in our profit and loss statement.

External Economic Benefits (FY2023)

Non-consolidated

Impact	Inventory	Reduction (t)	Inventory Market Price (yen/t)	External Economic Benefit (billion yen)
Climate change mitigation	CO_2	2,039,515	3,000	6.1
Depletion of energy resources	Crude oil	115,754	18,400	2.1
Depletion of mineral resources	Natural resources	4,545,574	1,000	4.5
Shortage of landfills	Waste	4,966,493	15,000	74.5
Total				87.2

Project Accounting – Ofunato Plant No. 5 kiln high-efficiency clinker cooler introduction

The clinker cooler uses air to cool clinker, an intermediate product fired inside an ultra-high-temperature rotary kiln. The high-temperature air obtained through heat exchange during cooling is effectively used as combustion air for the rotary kiln.

The high-efficiency clinker cooler introduced to the No. 5 kiln at the Ofunato Plant in FY2023 is a new type of cooler that can recover high temperature air while cooling clinker with a small amount of air. This cooler significantly improves heat recovery efficiency compared to conventional types. With this high-efficiency clinker cooler, the second we have introduced in Japan, we will reduce the amount of thermal energy required for clinker firing, further reducing CO_2 emissions and environmental impact.

Ofunato Plant No. 5 kiln

Investment amount: Approx. 9.2 billion yen

Reduction in CO_2 emissions: 7,149 tonnes/year