

Mitigating Climate Change

Relevant SDGs

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Greenhouse Gas Emissions and Achievement of Our CSR Objectives for 2025

► GRI102-11, 302-3, 305-1, 2, 4, 5

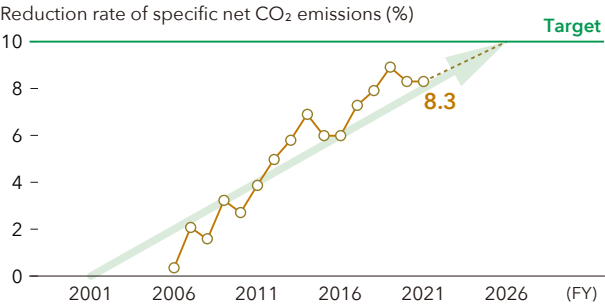
Among the total greenhouse gas emissions generated by our domestic group companies (excluding power generation companies) that are reporting their greenhouse gas emissions by business segment in accordance with the Act on Promotion of Global Warming Countermeasures, about 95% of greenhouse gas emissions were generated from cement production companies in FY2017.* Roughly 5% of our Scope 1 and 2 emissions were associated with our service stations, headquarters, branches and shipping, as well as electricity purchased by the group. Our Scope 3 emissions, calculated according to categories 1, 3, 4, 6 and 7 of the WBCSD/CSI Scope 3 guidelines, were roughly 4% of our Scope 1 and 2 emissions.

The bulk of greenhouse gas emissions associated with the operations of our group companies are directly associated with cement production. We have therefore set in the CSR Objectives for 2025 a medium to long-term quantitative target of reducing specific net CO₂ emissions by 10% or more from FY2001 levels.

Some of our plants are taking part in the target setting type emissions trading program for Saitama Prefecture and California’s cap-and-trade program, and striving to achieve the reduction targets. To support voluntary approaches we are also working in line with Keidanren’s voluntary action plan and the measures to reduce greenhouse gas emissions established by the WBCSD and GCCA.

* Most of our overseas group companies are cement production companies, so the ratio of cement production companies in our overall CO₂ emissions from production is higher than it would be for domestic companies alone.

Progress in Meeting the CO₂ Reduction Targets in CSR Objectives for 2025



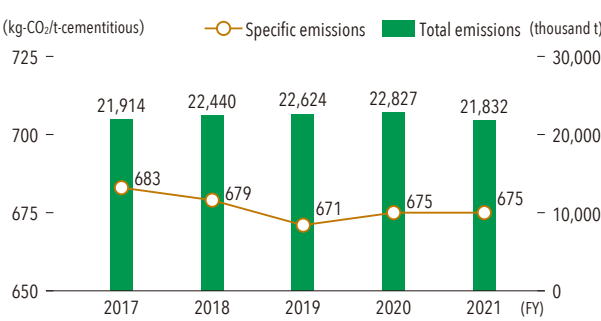
Efforts Related to the Cement Production Process

► GRI302-1, 3, 4, 305-4, 5

A significant amount of CO₂ 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 (CaCO₃ → CaO + CO₂). About 35% of CO₂ emissions generated during cement production are from the consumption of energy, about 55% are from the calcination of raw materials, and about 10% are from electricity use. In order to reduce CO₂ 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. We are also moving toward using recycled resources with less carbonate content to lower CO₂ emissions from the calcination of limestone. We are moving forward with the adoption of waste heat power generation to reduce CO₂ from electric power.

Our specific net CO₂ emissions for FY2021 were 675 kg of CO₂ per tonne of cementitious product, the same as in FY2020.

Specific Net CO₂ Emissions

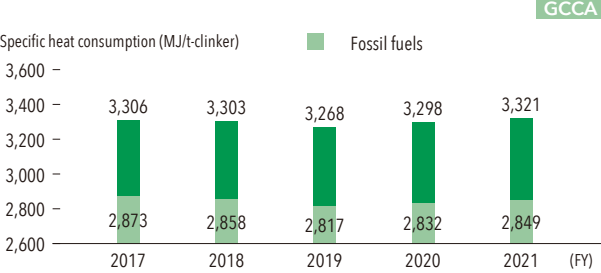


Reference guidelines: “GCCA Sustainability Guidelines for the monitoring and reporting of CO₂ emissions from cement manufacturing Ver. 0.1” GCCA

Efforts to Save Energy

Specific heat consumption of clinker production by the group’s cement plants in FY2021 was 3,321 MJ/t-clinker, a 23 MJ/t-clinker increase on the previous year’s level.

Specific Heat Consumption of Clinker Production

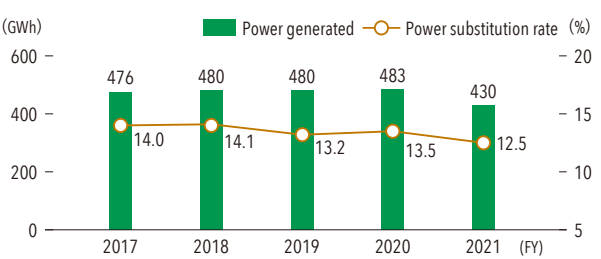


Reference guidelines: “GCCA Sustainability Guidelines for the monitoring and reporting of CO₂ emissions from cement manufacturing Ver. 0.1” GCCA

Waste Heat Power Generation

Waste heat power generation associated with the group’s cement production was 430 GWh in FY2021, a roughly 53GWh decrease on FY2020. Its ratio to all electricity consumed at our cement plants was about 12.5%. Assuming an emission factor of 0.69 t-CO₂/MWh if we were to purchase electric power from an external source, this works out as a reduction in CO₂ emissions of approximately 297 thousand tonnes.

Electricity Generated by Waste Heat

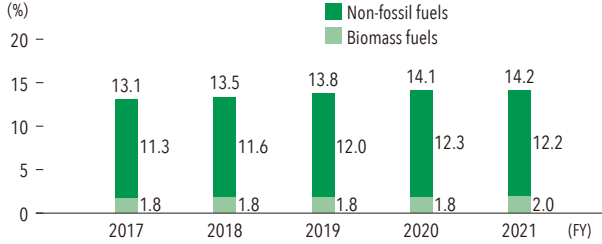


Reference guidelines: “GCCA Sustainability Guidelines for the monitoring and reporting of CO₂ emissions from cement manufacturing Ver. 0.1” GCCA

Alternative Energy Resources and Alternative Raw Materials

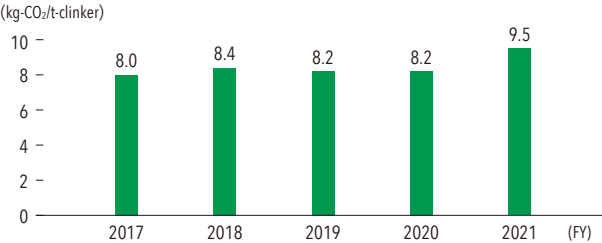
In FY2021, non-fossil energy and biomass energy accounted for about 14.2% of all energy used for group kilns. A decrease in CO₂ emissions of about 9.5kg-CO₂/t-clinker was also achieved by using alternative raw materials instead of limestone. Assuming an emission factor of 0.096 kg-CO₂/MJ for coal, our use of alternative energy resources alternative raw materials works out as a reduction in CO₂ emissions of approximately 1.47 million tonnes.

Ratio of Alternative Fuels and Biomass Fuels



Reference guidelines: “GCCA Sustainability Guidelines for the monitoring and reporting of CO₂ emissions from cement manufacturing Ver. 0.1” GCCA

Reduction of Specific CO₂ Emissions by Replacing Limestone with Alternative Raw Materials



Reference guidelines: “GCCA Sustainability Guidelines for the monitoring and reporting of CO₂ emissions from cement manufacturing Ver. 0.1” GCCA

Reducing CO₂ Emissions during Transportation

► GRI305-3

We contract the delivery of our raw materials and products to transportation companies and are striving to reduce CO₂ emissions as a specified consigner designated under the Japanese Energy Saving Act. Major efforts include implementing a plan to transport goods on return trips, encouraging drivers to eco-drive, and promoting energy efficient devices such as digital tachometers and eco-tires on vehicles. In shipping, we continue to pursue energy efficiency technologies and operate new ships that are equipped with various energy-saving features. We are also supporting energy-saving operations for conventionally powered ships.

Our FY2021 CO₂ emissions were roughly 8% lower than in FY2020 thanks to energy efficiency initiatives and a decrease in shipping volume.

CO₂ Emissions by Mode of Transportation (FY2021)

Non-consolidated				
Mode of transportation	Tonnage transported (thousand t)	Average Distance Transported (km)	Transported tonne-kilometers (thousand tkm)	CO ₂ emissions (thousand t)
Ship	16,147	469	7,576,805	105
Truck	14,150	55	781,305	46
Railway	5,001	26	127,890	3
Total	35,298	240	8,486,000	154