

Materiality: Realization of Carbon Neutrality



Climate change caused by greenhouse gas (GHG) emissions is a critical issue that has a massive impact on society and the economy. The Nikko Group is aware that it is part of its social responsibility to address the issue as a top priority. To achieve a decarbonized society, the Company aims to cut its CO₂ emissions by half compared to FY2013 as an interim target for 2030. This target includes CO₂ emissions from customers' plants delivered by Nikko, in addition to emissions from our business activities. Furthermore, to achieve carbon neutrality in 2050, we actively promote the development of technologies designed to help further reduce CO₂ emissions, along with the delivery of products and solutions that use those technologies.

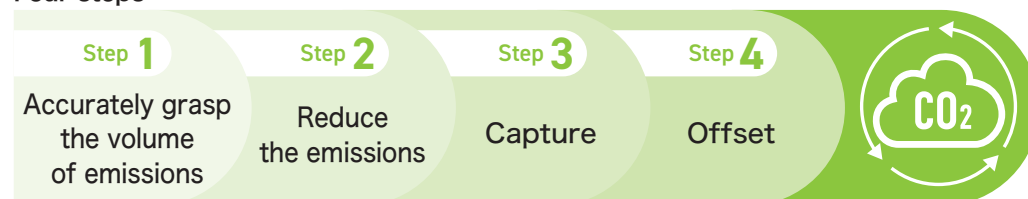
Four steps towards the realization of carbon neutrality

As the first step in its efforts toward carbon neutrality, the Nikko Group prioritizes measuring CO₂ emissions in Scopes 1, 2, and 3 as accurately as possible. In accordance with this policy, we began study on the main categories under certain assumptions in FY2021. The results of study in FY2024 found that CO₂ emissions in Category 11 of Scope 3 (Use of Sold Products) amounted to

approximately 640,000 tons, making up 87% of the total emissions in Scope 3.

We will share the study data with our customers to determine the most cost-effective approach to cutting CO₂ emissions, and will deliver products and solutions based on the approach. This is how we will increase the effectiveness of our efforts to reduce the emissions.

Four steps

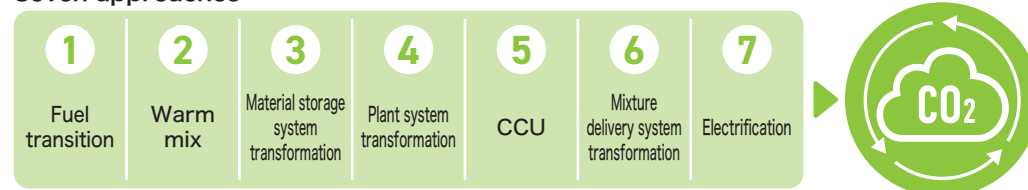


Seven approaches towards the realization of carbon neutrality

The Company conducted detailed analysis of energy consumption at its mixture plants in order to reduce CO₂ emissions from the mixture (asphalt mixture) manufacturing process. The results showed that about 80% of the total energy was consumed in the water removal and aggregate (recycled material) heating processes, leading us to find that reducing

the amount of water used in the drying and heating processes is an effective way to cut CO₂ emissions. Based on demonstrative results like these, the Nikko Group is actively working on developing decarbonized products using the seven approaches as the pillars, with its focus on reducing emissions.

Seven approaches



1. Fuel transition

We are developing and enhancing burners that are fueled by city gas, natural gas, or biomass as an alternative to heavy oil, which is a source of considerable CO₂ emissions. We have also launched research and development to create burners that use ammonia and hydrogen, which are considered CO₂-free fuels for the future, with a view to establishing next-generation combustion technology.

2. Warm mix technology

We have adopted a technology that allows us to manufacture a mixture at lower temperatures by adding water to asphalt to produce foam and reduce viscosity. The use of Nikko's proprietary warm mix equipment has reduced energy consumption in the heating process, helping curb CO₂ emissions. More than 100 units of the equipment have already been installed at plants in operation, contributing to the manufacturing of medium-temperature mixtures.

3. Material storage system transformation

Reducing water contained in aggregate, raw material of asphalt mixture, in advance holds down energy consumption during the heating process, leading to reduced CO₂ emissions. Thermal efficiency is improved by managing water content before injecting the material. We will also explore how to improve the efficiency of transport of not only asphalt mixtures, but also aggregate (raw material of the mixtures) and asphalt.

4. Plant system transformation

We collect and reuse exhaust gas and exhaust heat from plant operation to heat and process aggregate, thereby reducing the amount of newly injected energy. This allows us to cut the CO₂ emissions from the entire plants.

5. Use of carbon capture and utilization (CCU) technology

We reduce leakage of CO₂ emissions from concrete plants by using a technology for adsorbing and immobilizing such emissions. We are also working on research and development to establish a collaborative scheme for cutting CO₂ emissions, which enables concrete plants to adsorb and use CO₂ emitted from asphalt plants.

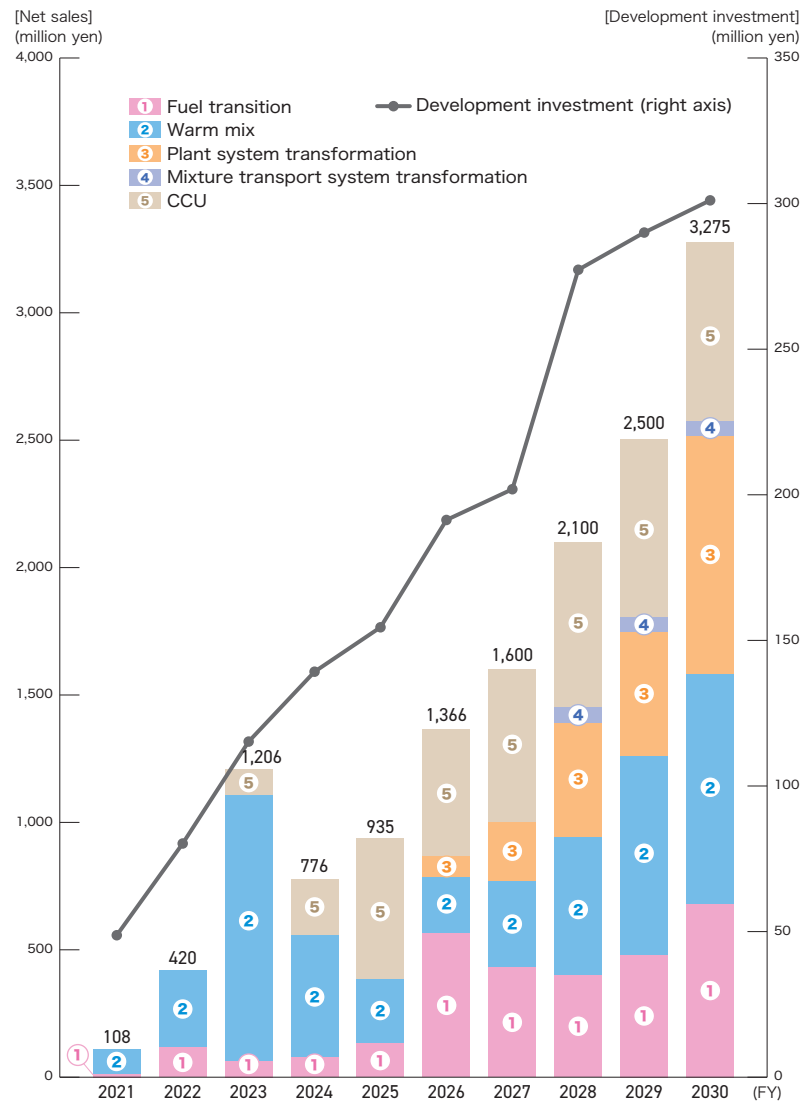
6. Mixture delivery system transformation

We will establish a technology for long-distance transportation of mixtures, thereby improving the efficiency of delivery to the desired location. This will allow us to improve production efficiency by integrating dispersed manufacturing bases, while reducing energy consumption and CO₂ emissions.

7. Electrification

In anticipation of the wide use of CO₂-free electricity, we promote the electrification of drying and heating equipment. To transition away from fossil fuels, moreover, we work on product development for next-generation all-electric asphalt plants.

Net sales target and investment plan for decarbonization and low-carbon products (Actual figures for FY2021 to FY2024)



For details of the road map for product development for carbon neutrality, please visit our website:
<https://www.nikko-net.co.jp/sustainability/carbon-neutral.html>

Information disclosed based on TCFD framework



To achieve carbon neutrality in 2050, the Nikko Group is actively working to develop technologies designed to help reduce CO₂ emissions and to deliver products and solutions based on these technologies. In October 2021, we endorsed the TCFD (Task Force on Climate-related Financial Disclosures) recommendations. We ensure correct understanding and assessment of the risks and opportunities that climate change brings to our businesses.

We will continue to disclose information in accordance with the TCFD framework to establish smooth communication with all stakeholders, including shareholders and investors.

Governance

Carbon neutrality promotion structure

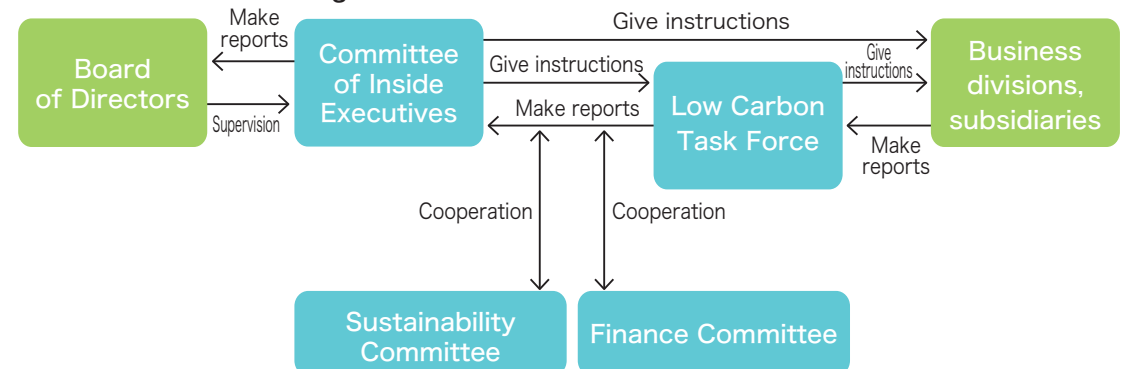
The Nikko Group has set up the Low Carbon Task Force (LCTF) led by the managers of the Technology Development Division as a structure designed for the realization of carbon neutrality.

The LCTF meets monthly to conduct verification based on actual measurement data and evidence. Then it examines and discusses issues in a cross-divisional manner for the realization of carbon neutrality.

Proposals drafted by the LCTF are submitted to the Committee of Inside Executives for discussion, so that specific targets are set and strategies based thereon are developed. The LCTF also works collaboratively with the Sustainability Committee (chaired by a Director and Executive Officer) and the Finance Committee in order to ensure consistency and maintain the impetus across the Company.

Finally, the Board of Directors deliberates on investment plans, product development plans, and risk management measures prepared by the Committee of Inside Executives to continuously supervise their validity and progress.

Governance structure diagram



Strategy

Climate change scenario analysis

Nikko Group assumes the future temperature rise scenarios in the range of 2°C and 4°C upon carrying out the scenario analyses for 2030 and 2050.

Reference scenarios

IEA “World Energy Outlook 2020”

- STEPS (current policy scenario)
- SDS (sustainable development scenario)

IPCC AR5

- RCP2.6 (2°C scenario)
- RCP8.5 (4°C scenario)

Risk management

At the Nikko Group, the Low Carbon Task Force (LCTF) leads the task of planning measures relevant to the Group's objectives of achieving carbon neutrality and advancing company-wide actions to tackle climate change. The LCTF explores feasible approaches based on scientific grounds, serving the central role in company-wide efforts.

The Committee of Inside Executives discusses and assesses the impact of climate change and countermeasures to handle it. Based on the outcomes of the discussions and assessments, the committee formulates policies, key measures and targets, and action plans for minimizing climate risks.

The contents of the discussion at the meetings of the Committee of Inside Executives are reported to the Board of Directors twice a year or more. The Board of Directors receives climate change action plans and periodic risk assessment reports from the Committee of Inside Executives and the Compliance and Risk Management Committee. Then it deliberates on the validity of the plans and reports to fulfill its supervisory function, thereby ensuring the effectiveness of company-wide governance.

Business and financial impact of climate-related risks and opportunities based on scenario analysis; medium- to long-term measures addressing risks and opportunities

2°C scenario (assuming progress in low-carbonization)	Risks	Impact on finance	Likelihood of occurrence	Countermeasures
	Rapid shift to decarbonized burners (plants)	High	Medium	Speed up product development.
	Request from users to share the carbon tax burden (discount)	High	Low	Tirelessly explain to and negotiate with customers
	Market introduction of highly carbon-efficient roadbed materials alternative to asphalt	High	Low	R&D based on insights gained from marketing
	Increase in R&D expenses and capital investment	Medium	High	Improve efficiency of development. Clarify priorities.
	New entry by boiler, burner, and electric furnace manufacturers	High	Low	Strengthen analysis of expected new entrants. Acquire related intellectual properties at an early stage.
	Decrease in the number of operating plants due to centralization to large plants	Medium	Medium	Identify users who will survive and recommend systematic maintenance to such users
	Increase in the cost of procurement of raw materials (steel materials, etc.)	High	High	Strengthen function-focused purchasing, passing on costs to product prices, etc.
	Increase in the cost of electricity derived from renewable energy	Low	High	Streamline plant operations and pass on costs to product prices
	Increase in the cost of procurement of alternative fuels	Low	High	Promote a wide range of fuel procurement methods
	Decrease in the number of plants of pavement operators due to stricter CO ₂ emissions regulations	High	Medium	Expand into new markets (new markets in Japan + overseas pavement business)
	Increased carbon tax burden due to stricter Scope 3 regulations	High	Medium	Accelerate product development and pass on costs to product prices
	Opportunity	Impact on finance	Likelihood of occurrence	Countermeasures
	Demand for updating to low-carbon or decarbonized burners (plants)	High	High	Diversify fuels and enhance product lineup
	Growth in market share due to superiority in the R&D competition	High	Medium	Further strengthen technology development investment
	Increase in demand for concrete products (roadbed materials alternative to asphalt)	Medium	Low	Transform plants to pavement concrete production
	Growth in demand for recycling and low-carbon plants due to stricter environmental restrictions in China and Southeast Asian countries	Low	Low	Reinforce overseas production bases
	Provocation of demand for new plants due to spread of CO ₂ fixation concrete	Low	Medium	Enhance lineup of plants for CO ₂ absorbing concrete
	Increase in demand for lithium battery recycling equipment due to expansion of the EV market	Low	Medium	Enhance lineup of environmentally friendly and recycling products
	Increase in government subsidies due to stricter Scope 3 regulations	High	Low	Strengthen organizational framework for subsidy management

4°C scenario (assuming low-carbonization scenario is not promoted)	Risks	Impact on finance	Likelihood of occurrence	Countermeasures
	Expansion of the new roadbed and construction material markets due to measures against heat island effect (shrinkage of the existing asphalt and concrete markets)	Medium	Low	Launch products developed using core technologies in the new construction material market
	Increase in the cost of procurement of materials due to suspension of supply chains	Low	Medium	Diversify supply chains including those overseas
	Increase in BCP expenses	Low	High	Appropriately pass on costs to product prices
	Increased product costs due to additional disaster-response equipment	Medium	Medium	Ensure appropriate cost pass-through to products
	Opportunity	Impact on finance	Likelihood of occurrence	Countermeasures
	Increase in demand for preemptive maintenance for stable operation	High	Low	Improve the efficiency of the maintenance business using IoT
	Increase in demand for disaster prevention or mitigation models	Medium	Medium	
	Increase in demand for disaster prevention products (waterproof boards, temporary scaffolding, etc.)	Medium	High	Strengthen manufacturing capacity and reorganize manufacturing sites
	Increase in demand for counter-disaster mobile plants	Medium	Medium	Develop and enhance lineup of temporary and mobile products
	Increase in needs for transferring plants to areas with low disaster risk	Low	Low	
	Growth in demand for disaster prevention or mitigation in China and Southeast Asian countries	Low	Medium	Reinforce overseas production bases
	Expansion of the budget for National Resilience	High	High	

Metrics and targets

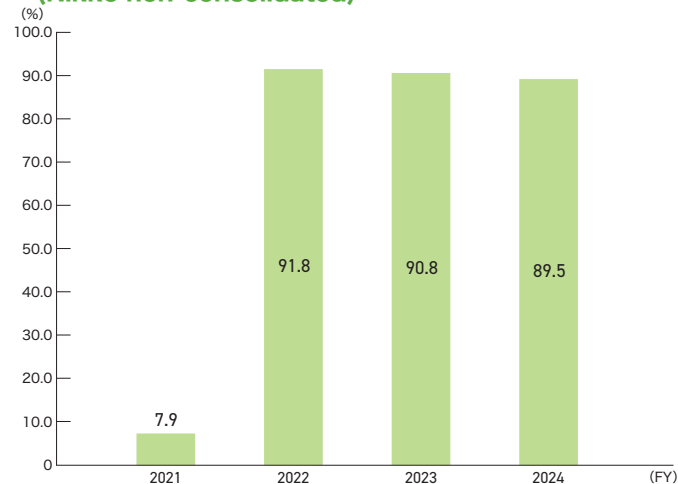
The Nikko Group has the targets of net-zero CO₂ emissions from its business activities and products on the market (carbon neutrality) by 2050, and of a 50% reduction in the emissions compared to FY2013 by 2030. To achieve these targets, we pursue the full enforcement of energy-saving activities and the active and effective use of renewable energy, in addition to product development geared to help reduce CO₂ emissions.

As a result of these efforts, the verified value of CO₂ emissions in FY2024 that include Scopes 1, 2, and 3 dropped to as low as 56.7 compared to FY 2013 (with the value for FY2013 being 100), indicating that we have been making solid progress.

Utilization of renewable energy-based electricity

In March 2022, the Nikko Group switched the electricity used at the Nikko head office factory to electricity produced only from renewable energy sources in order to speed up the decarbonization of our business activities. This switchover has dramatically cut CO₂ emissions in Scope 2 (emissions from purchased electricity). Going forward, this initiative will be phased in at sales offices and Group companies throughout Japan. We aim to achieve 100% introduction of renewable energy-based electricity (RE100) across the Nikko Group (Japan) by 2030.

Ratio of renewable energy power introduced (Nikko non-consolidated)



Verified Scope 1, 2, and 3 CO₂ emissions (t-CO₂)

		Target activities	FY2013	FY2024
Scope 1	Combustion of fuels	Emissions from manufacturing, processing, and experimenting	430	299
Scope 2	Use of electricity	Electricity use at all companies including dorms	2,639	180
Scope 3	Category			
	1	Purchased products and services	39,073	52,934
	2	Capital goods	2,137	3,598
	3	Fuel- and energy-related activities not included in Scope 1 and 2	367	327
	4	Transport, delivery (upstream)	26,386	38,974
	5	Waste from the business	115	47
	6	Business trips	84	101
	7	Commuting by employees	310	320
	11	Use of products sold	1,226,848	639,751
	12	Disposal of products sold	93	77
Total			1,298,482	736,607
Vs. FY2013			100.0%	56.7%