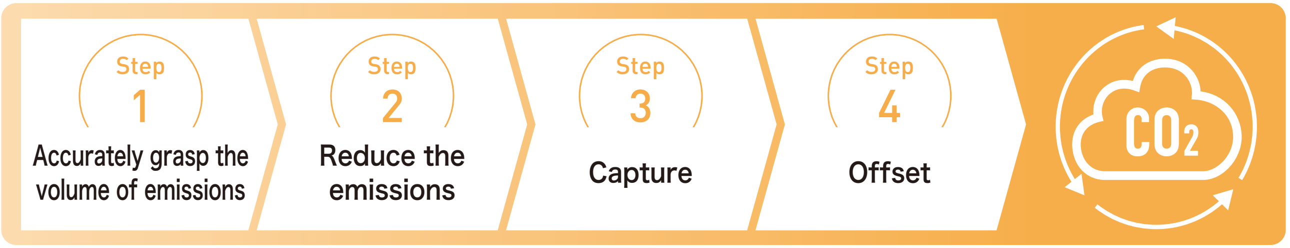
Materiality: Realization of Carbon Neutrality

Climate change caused by greenhouse gas (GHG) emission has an enormous impact on society and economy, and Nikko Group recognizes that it is the most pressing social issue the Group should work on. For the realization of a decarbonized society, Nikko Group is aiming to achieve a 50% reduction in CO_2 emissions (compared with FY 2013) from its business activities as well as operation of Nikko-made plants at customers as an interim target for FY 2030. In addition, the Group is promoting the development of technologies for reducing CO_2 emissions and provision of related products and solutions towards achieving carbon neutrality in 2050.

Four steps towards the realization of carbon neutrality

To grasp CO_2 emissions in Scope 1, 2, and 3 as accurately as possible, we have been verifying major categories by setting certain conditions since FY 2021. The results of the verification show that CO_2 emissions from the use of products such as Nikko-made plants sold were 680,000 tons (verified in FY 2023), accounting for 89.3% of overall emissions in Scope 3. The Group offers products and solutions by identifying the most cost-effective methods for reducing CO_2 emissions, while sharing with customers the verification data for Category 11 of Scope 3.

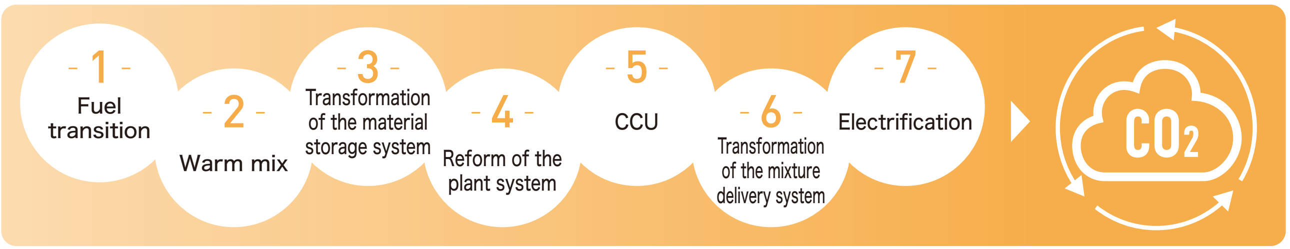
Four steps



Seven approaches towards the realization of carbon neutrality

To accurately understand the CO_2 emissions during the mixture manufacturing process, Nikko analyzed the energy consumption at the mixture plants. Since about 80% of energy is used to remove water and heat aggregates (recycled materials), reducing the water content has proved effective in reducing the energy consumption in the drying and heating process. Based on such verified data, Nikko has been taking seven approaches to developing products aimed at decarbonization as part of efforts to reduce emissions.

Seven approaches



1) Fuel transition

To replace heavy oil, which has high CO_2 emissions, the Group has been developing burners using ammonia and hydrogen, which are promising CO_2-free fuels, in addition to the development and improvement of burners that use city gas, natural gas, and biomass fuels. We are at the stage where we are ready to implement some of the products.

2) Warm mix

Manufactures asphalt mixture at a temperature lower than the usual heating temperature by reducing the viscosity of asphalt by adding water to heated asphalt and foaming it. Use of warm mix equipment developed with Nikko's original technologies reduces the energy consumption in heating, thus helping reduce CO_2 emissions.

3) Transformation of the material storage system

Reducing water in aggregate, which is the raw material of asphalt mixture, enables to lower energy consumption in the aggregate incineration process, thus reducing CO_2 emissions.

4) Reform of the plant system

CO_2 emissions can be reduced by lowering the amount of newly used consumption energy by recycling exhaust gas and heat from plant operation for heating and processing aggregate. We aim to save even more energy by combining existing equipment and reconstructing it as a new system.

5) CCU

The external CO_2 emissions of a plant can be reduced by absorbing CO_2 emitted at the plant using the technology to absorb CO_2 with concrete. We are also promoting research and development for absorbing the CO_2 emitted from asphalt plants at concrete plants.

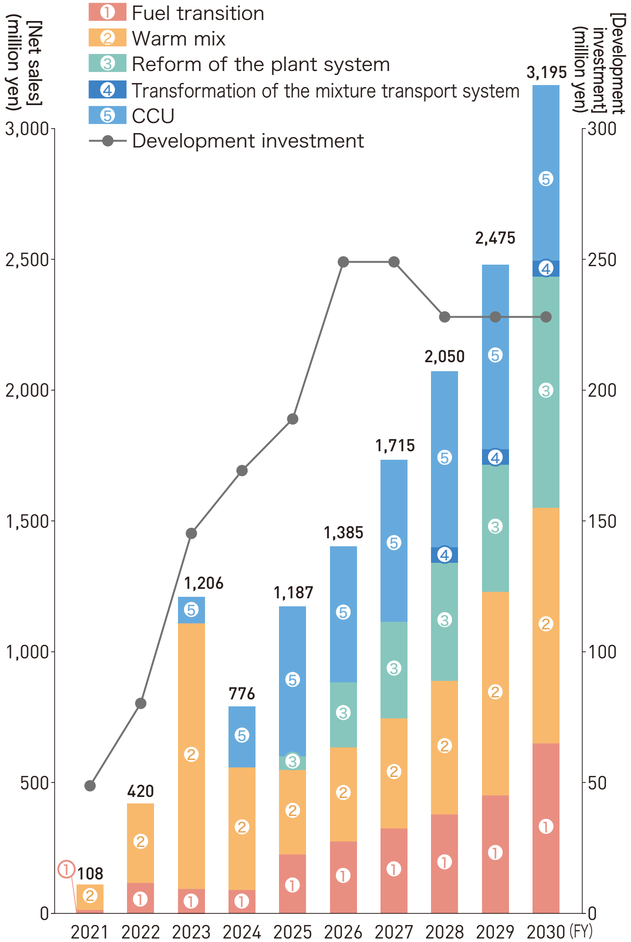
6) Transformation of the mixture delivery system

CO_2 emissions can be reduced by lowering energy consumption by improving production efficiency of mixture through establishment of technology for extending the distance of mixture transport and improving transport efficiency from the plant to the destination.

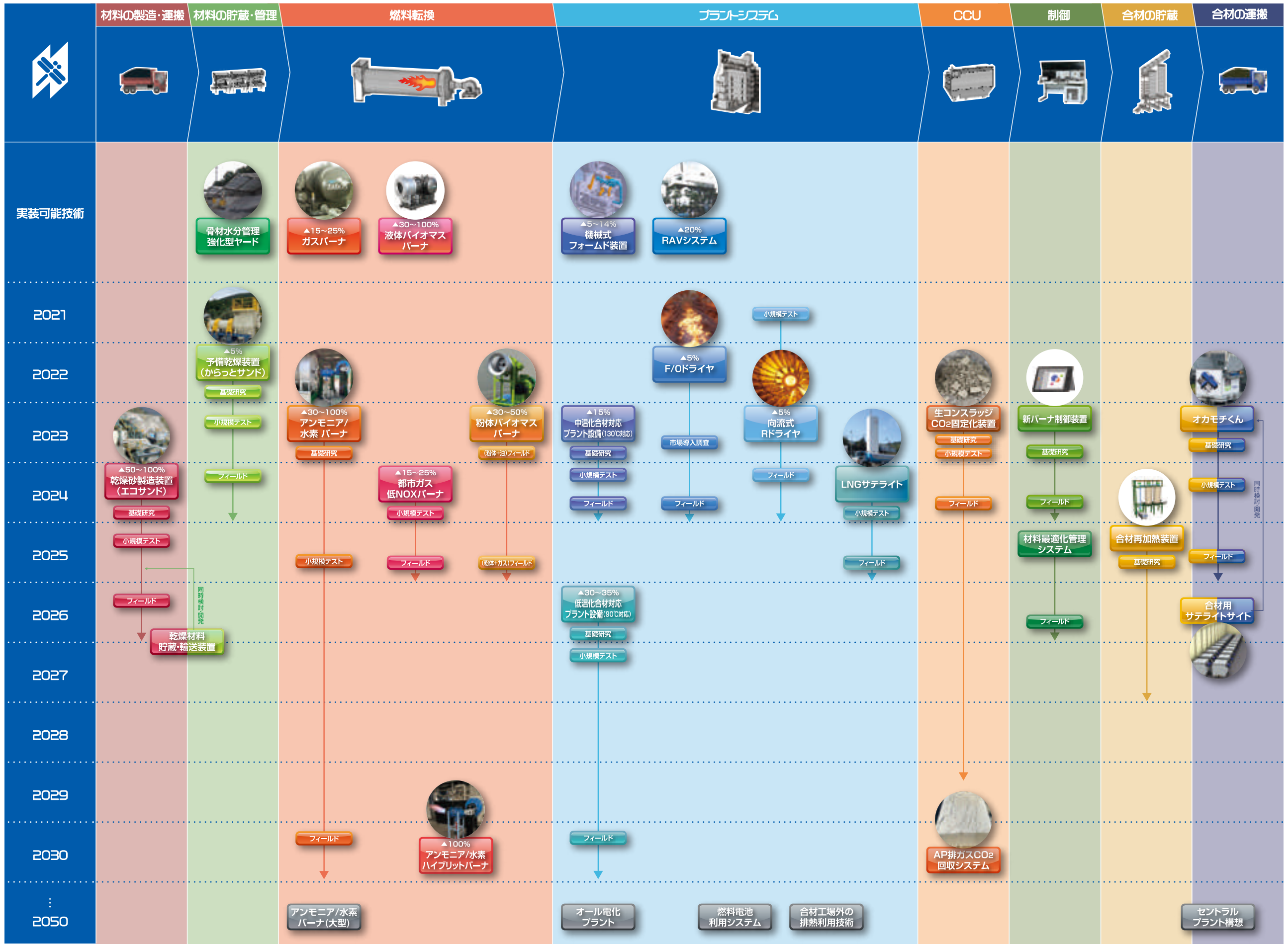
7) Electrification

Assuming that the use of CO_2-free electricity would spread, we are considering development of an all-electric plant to replace fossil fuels by promoting the electrification of drying and heating equipment.

Net sales target of decarbonization and low-carbon products and investment plan (the figures from FY 2021 to 2023 are results)



Road map for the development of carbon-neutral AP products



For details of the road map for the development of AP products, visit our website (https://www.nikko-net.co.jp/sustainability/carbon-neutral.html)

Information disclosed based on TCFD framework

The Group is promoting the development of technologies that can reduce CO_2 emissions and provision of related products and solutions towards achieving carbon neutrality in 2050. After endorsing the TCFD recommendations in October 2021, it has been disclosing information in accordance with the TCFD framework for smooth communication regarding climate change issues with stakeholders including shareholders and investors.

Governance

Carbon neutrality promotion structure

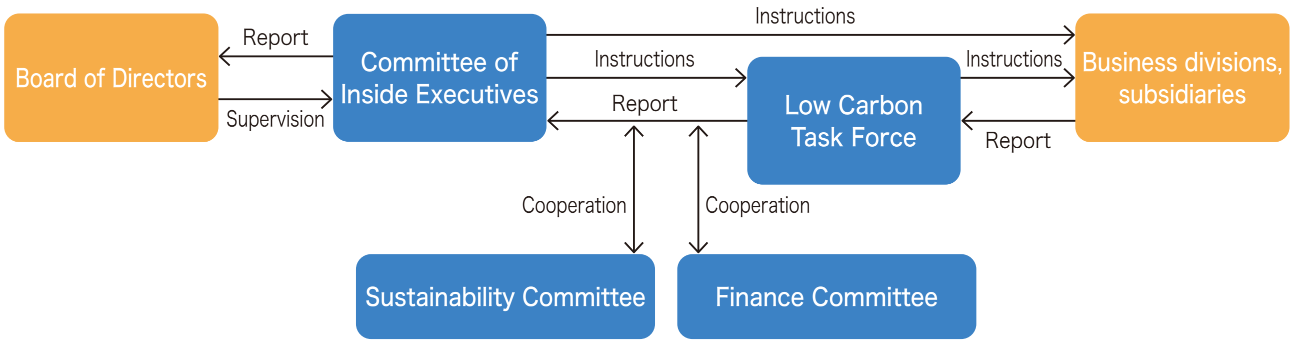
Nikko established the Low Carbon Task Force (LCTF) led by the managers of the Business and Technology Development Divisions to promote the realization of carbon neutrality. Through its monthly LCTF meetings, it examines and discusses the issues in a cross-divisional manner for the realization of carbon neutrality based on data verification and evidence.

The Committee of Inside Executives discusses the plan proposal drafted by LCTF and formulates concrete target values and specific strategies for achieving the targets. It also works together with the Sustainability Committee chaired by the Director as well as the Finance Committee as necessary. The Board of Directors, at its meetings, deliberates the investment plan, product development plan, and risk countermeasures formulated by the Committee of Inside Executives and supervises their adequacy and progress.

Status of the initiatives related to the four core elements of the TCFD recommendations

	Nikko Group's initiatives
Governance	● The Group has established the Low Carbon Task Force (LCTF) led by the managers of business and development divisions, which gathers and analyzes carbon neutrality-related information and carries out planning (once a month meetings). ● The Committee of Inside Executives sets forth targets based on the proposals by LCTF and formulates detailed strategies for achieving them (as necessary). ● The Sustainability Committee and the Finance Committee work together to identify risks and opportunities and discuss countermeasures (as necessary) ● Key measures and action plans formulated by the committee are promoted company-wide and the progress is reported to the Board of Directors. ● The Board of Directors deliberates on the validity of strategies and inherent risks and supervises the progress towards targets (twice a year or more).
Strategy	● Identify risks and opportunities in scenario analysis considering the 2°C and 4°C scenarios, decide on medium- to long-term measures, and manage their progress ● Analyze the impact of risks and opportunities on business and finance ● Formulate development plan for low-carbon and decarbonization-related products and their market introduction plans
Risk management	● The Risk Management Committee chaired by Director and Vice President identifies and manages risks that have major impact on business and finance as priority management risks. ● The committee shares risk information with the Committee of Inside Executives and the Board of Directors and decides appropriate responses from the perspective of company-wide risk management.
Metrics and Targets	● Verification of CO_2 emissions by Nikko Co., Ltd. ● Switch to renewable energy-based electricity and establishment of RE100 target (FY 2030) ● Verification of Scope 3 (in the entire supply chain) CO_2 emissions ● Setting of the FY 2030 interim target and the FY 2050 target based on scenario analysis <FY 2023 results> ● CO_2 emissions (Scope 1 and 2): 407t-CO_2 (down 16.6% vs. FY 2022) ● CO_2 emissions (Scope 3): 762,789t-CO_2 (up 2.7% vs. FY 2022) <FY 2030 target> ● CO_2 emissions (Scope 1, 2, and 3): 650,000t-CO_2 (50% reduction vs. FY 2013 results) <FY 2050 target> ● Aim for net-zero CO_2 emissions (Scope 1, 2, and 3)

Governance structure diagram



Strategy

Climate change scenario analysis

Nikko 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)

Business and financial impact of climate-related risks and opportunities based on scenario analysis; medium- to long-term measures addressing risks and opportunities and results for FY 2023

2°C scenario (assuming progress in low-carbonization)

Risks	Impact on finance	Likelihood of occurrence	Countermeasures	FY 2023 results
Rapid shift to decarbonized burners (plants)	High	Medium	Speed up product development.	• Completed demonstration tests of burners fired by decarbonized fuels such as hydrogen, ammonia, and powder biomass. • Increased R&D expenses (700 million yen) • Prepared a decarbonization technology roadmap. • Revised the price table due to increase in procurement costs. • The head office factory switched to green electricity. • Sales of decarbonization-related products increased.
Request from users to share the carbon tax burden (discount)	High	Medium	Tirelessly explain to and negotiate with customers	
Market introduction of highly carbon-efficient roadbed materials alternative to asphalt	High	Low		
Increase in R&D expenses and capital investment	Medium	High	Improve efficiency of development. Clarify priorities.	
Decarbonized burners, CO_2 capture and storage technology, etc.	Medium	High	Speed up product development.	
New entry by boiler, burner, and electric furnace manufacturers	Medium	Medium	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.)	Medium	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)	
Opportunity	**Impact on finance**	**Likelihood of occurrence**	**Countermeasures**	**FY 2023 results**
Demand for updating to low-carbon or decarbonized burners (plants)	High	High	Diversify fuels and enhance product lineup	• Increased number of business negotiations for CO_2-absorbing plants • Promoted proposals for recycling plants targeting ASEAN • Increased the number of employees engaged in technology development • The number of patent applications increased.
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	Medium	Low	Reinforce overseas production bases	
Provocation of demand for new plants due to spread of CO_2 fixation concrete	Medium	High	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	

Risk management

The Low Carbon Task Force (LCTF) formulates and drafts the carbon neutrality-related plans and promotes company-wide response to climate change.
The Risk Management Committee evaluates and identifies climate change-related impact on the Company and manages the effects. Furthermore, it plays the role of integrating the impact of climate change-related risks into company-wide risks by closely collaborating with the Committee of Inside Executives.
The Committee of Inside Executives discusses the impact of and response to climate change and evaluates them. It also 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 performs the supervisory function, regularly receiving reports on climate change-related action plan and risk evaluation from the Committee of Inside Executives and the Risk Management Committee, and deliberating on those reports.

<table>
<tr><td rowspan="14">4°C scenario (assuming low-carbonization scenario is not promoted)</td><th>Risks</th><th>Impact on finance</th><th>Likelihood of occurrence</th><th>Countermeasures</th><th>Results</th></tr>
<tr><td>Expansion of the new roadbed and construction material markets due to measures against heat island effect (shrinkage of the existing asphalt and concrete markets)</td><td>Medium</td><td>Low</td><td>Launch products developed using core technologies in the new construction material market</td><td rowspan="3">● Established a dedicated department for lateral deployment of the core technologies.
● Unearthed new suppliers mainly in the ASEAN region.
● Revised the price list as needed.</td></tr>
<tr><td>Increase in the cost of procurement of materials due to suspension of supply chains</td><td>Low</td><td>Medium</td><td>Diversify supply chains including those overseas</td></tr>
<tr><td>Increase in BCP expenses</td><td>Low</td><td>High</td><td>Appropriately pass on costs to product prices</td></tr>
<tr><th>Opportunity</th><th>Impact on finance</th><th>Likelihood of occurrence</th><th>Countermeasures</th><th>Results</th></tr>
<tr><td>Increase in demand for preemptive maintenance for stable operation</td><td>High</td><td>Low</td><td>Improve the efficiency of the maintenance business using IoT</td><td rowspan="9">● Promoted use of subscription service for maintenance.
● Established a production base in ASEAN.
● Acquired land for factories in Japan as needed.
● Increased the number of employees engaged in technology development
● The number of patent applications increased.</td></tr>
<tr><td>Increase in demand for disaster prevention or mitigation models</td><td>Medium</td><td>Medium</td><td rowspan="4">Strengthen manufacturing capacity and reorganize manufacturing sites
Develop and enhance lineup of temporary and mobile products</td></tr>
<tr><td>Increase in demand for disaster prevention products (waterproof boards, temporary scaffolding, etc.)</td><td>Medium</td><td>High</td></tr>
<tr><td>Increase in demand for counter-disaster mobile plants</td><td>Low</td><td>Medium</td></tr>
<tr><td>Increase in needs for transferring plants to areas with low disaster risk</td><td>Low</td><td>Low</td></tr>
<tr><td>Increase in demand for concrete products (roadbed materials alternative to asphalt)</td><td>Medium</td><td>Low</td><td>Transform plants to pavement concrete production</td></tr>
<tr><td>Growth in demand for disaster prevention or mitigation in China and Southeast Asian countries</td><td>Low</td><td>Medium</td><td>Reinforce overseas production bases</td></tr>
<tr><td>Expansion of the budget for National Resilience</td><td>High</td><td>High</td><td>Prepare for an increase in demand</td></tr>
</table>

The degree of financial impact is evaluated across three levels between high, medium, and low, depending on the likeliness of occurrence of the risks and opportunities and their impact on periodic income.

Metrics and targets

Nikko Group aims to realize virtually zero CO_2 emissions from its business activities and Nikko products it sells in 2050. It promotes the development of products that contribute to the reduction of CO_2 emissions as well as thorough energy saving activities and proactive utilization of renewable energy. Including these responses, the Group has reduced the verified Scope 1, 2, and 3 CO_2 emissions to 58.8 in FY 2023 when the emissions in FY 2013 are set at 100.

● Interim targets (2030) of CO_2 emissions (Scope 1, 2, and 3)

FY 2023 CO_2 emission results

407t-CO_2 (Scope 1 and 2); 762,789t-CO_2 (Scope 3)

FY 2030 CO_2 emissions

650,000t-CO_2 (Scope 1, 2, and 3)(50% reduction vs. FY 2013 results)

<Nikko Co., Ltd.>

Utilization of renewable energy-based electricity

Nikko Co., Ltd. switched all electricity used at its head office factory to electricity generated from renewable energy sources in March 2022. The move significantly reduced the Scope 2 CO_2 emissions from 2,454t-CO_2 in FY 2021 to 139t-CO_2 in FY 2023. Going forward, we will pursue this initiative also at sales offices and group companies throughout Japan, aiming to achieve RE100 (100% introduction of renewable energy-based electricity) in the Nikko Group (Japan) by 2030.

● Ratio of introduction of renewable energy-based electricity at Nikko (non-consolidated)

FY 2021 7.9%
FY 2022 91.8%
FY 2023 90.8%

RE100 achievement target: FY 2030 at the Nikko Group in Japan

Verified Scope 1, 2, and 3 CO_2 emissions (t-CO_2)

	Category		Target activities	FY 2013	FY 2020	FY 2021	FY 2022	FY 2023
Scope 1		Combustion of fuels	Emissions from manufacturing, processing, and experimenting	430	305	286	297	268
Scope 2		Use of electricity	Electricity use at all companies including dorms	2,639	2,454	2,354	191	139
Scope 3	1	Purchased products and services	Emissions in upstream of the products purchased (including raw materials and office supply)	39,073	48,002	54,341	44,645	47,023
Scope 3	2	Capital goods	Emissions in upstream of capital investment that has been recently introduced	2,137	3,946	2,279	2,345	2,106
Scope 3	3	Fuel- and energy-related activities not included in Scope 1 and 2	Emissions from mining, refining, etc. of the fuel used for burning and generating electricity in Scope 1 and 2	367	328	324	317	308
Scope 3	4	Transport, delivery (upstream)	Procurement and transport of raw materials and parts, and shipment of products (costs borne by the company)	26,386	24,670	28,564	29,283	32,031
Scope 3	5	Waste from the business	Waste disposal, recycling of goods other than valuables, emissions from transport	115	61	47	46	43
Scope 3	6	Business trips	Emissions from business trips by employees (rail service and airplane)	84	83	85	91	96
Scope 3	7	Commuting by employees	Emissions from employees' commute (rail service, bus, ship, automobile, motor bike)	310	304	279	295	290
Scope 3	11	Use of products sold	Emissions from operating AP, BP, and conveyors sold	1,226,848	698,501	682,181	665,664	680,820
Scope 3	12	Disposal of products sold	Emissions from disposal of AP, BP, and environmental plants sold	93	95	93	74	72
			Total	1,298,482	778,749	770,833	743,248	763,196
			Vs. FY 2013	100.0%	60.0%	59.4%	57.2%	58.8%