

Reducing Our Environmental Impact

Results of the Mid-term Corporate Plan for the Environment

Nippon Kayaku has established a mid-term corporate plan for the environment for the period running from fiscal 2011 to fiscal 2020 that consists of six items covering three areas. Fiscal 2011 was the first year of this plan.

● Mid-term Corporate Master Plan for the Environment

Area	Item (FY 2011 – FY 2020)	Target value	FY 2011	Details
Reducing Our Chemical Substance Footprint	VOC*1 Emissions	Under 45 tons	92 tons	Reduced by 13% compared to fiscal 2010
	COD*2 Emissions	Under 180 tons	123 tons	Reduced by 23% compared to fiscal 2010
Prevention of Global Warming	Energy Derived CO ₂ Emission*3 (Production Divisions+ Operation Divisions)	More than 15% reduction	75,800 tons	CO ₂ emissions increased by 0.8% compared to fiscal 2010, but have been reduced by 21.2% compared to fiscal 1990.
Reduction of Waste	Total Waste Produced	Under 30,000 tons	22,298 tons	Reduced by 15% compared to fiscal 2010
	Recycling Rate	More than 70%	63.5%	Increased by 1.4% compared to fiscal 2010
	Zero Emission Rate*4	Under 3%	13.1%	We continue to strive to reduce the amount of waste we dispose of in landfills. In fiscal 2011, the Kashima Plant achieved zero net waste emissions.

*1 VOC: Volatile Organic Compounds (VOCs). This tally includes all chemical substances emitted into the atmosphere, including those derived from reactions involving chemical substances not subject to reporting regulations.

*2 COD: Chemical Oxygen Demand. An indication of the amount of oxygen needed to oxidize a subject compound by oxidizing subject compounds under a predetermined condition using oxidizing agents, then measuring the amount of oxidizing agents used in the process. A high COD level means that the water contains a large amount of organic chemical substances that consume oxygen. With lower oxygen content, the water cannot sustain biological life, which stops the natural purification process, leading to a muddied and odorous water environment.

*3 Fiscal 1990 has been set as the benchmark (96,200 tons)

*4 Zero emission rate: The amount of internal and external landfill waste produced as a percentage of total waste produced.

Results of Our Efforts to Reduce Environmental Impacts

As part of its effort to reduce environmental impacts, Nippon Kayaku focuses on preventing air, water and noise pollution as well as stopping global warming and reducing waste.

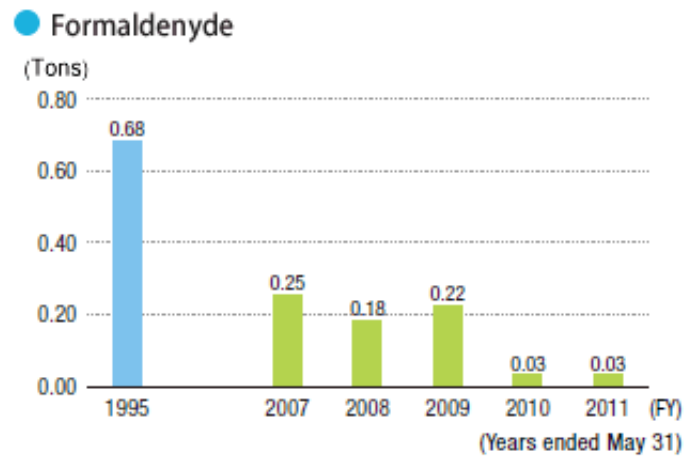
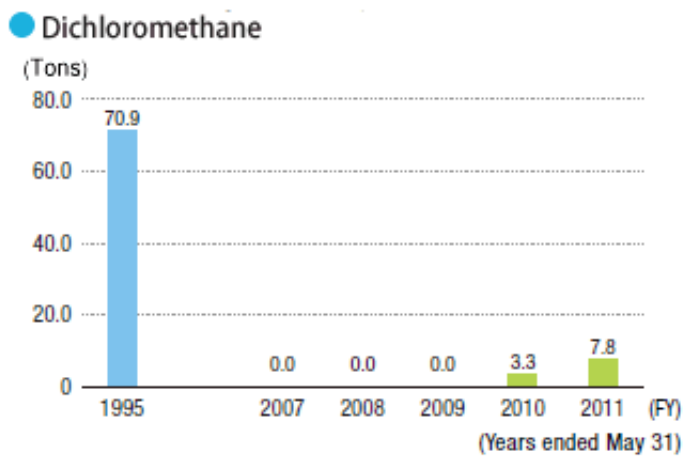
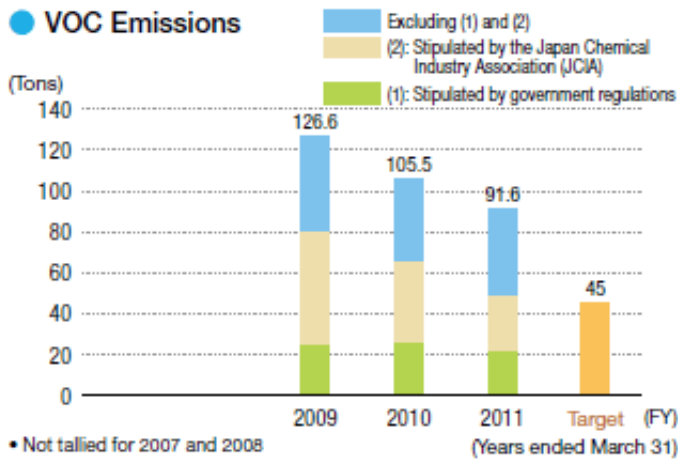
Preventing Air Pollution

To help prevent air pollution, we carefully manage substances subject to Japan's Air Pollution Control Act, hazardous substances released into the air and other air pollutants.

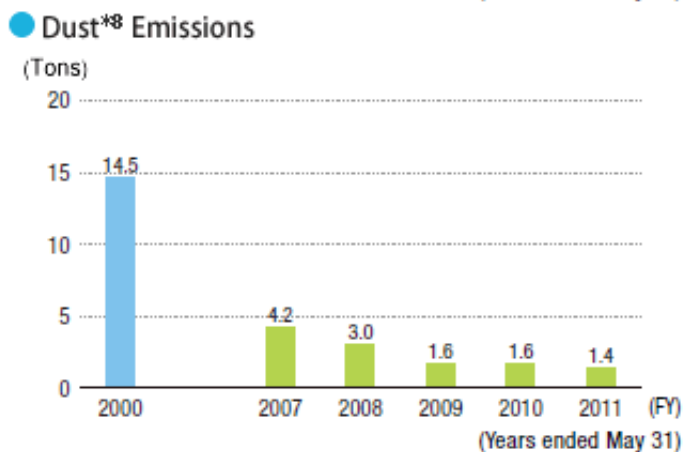
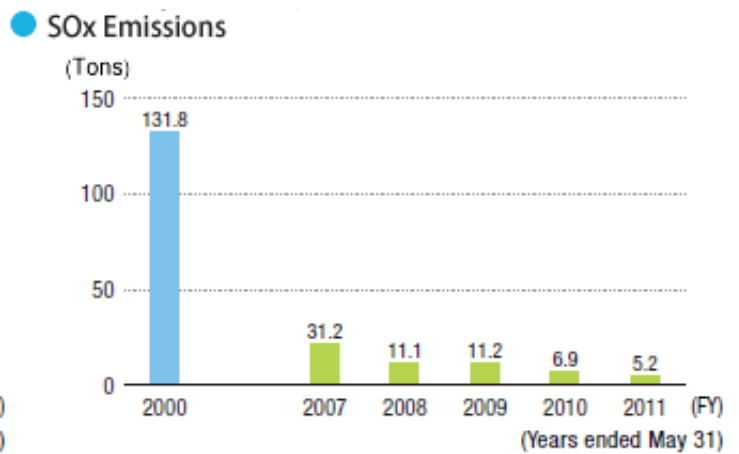
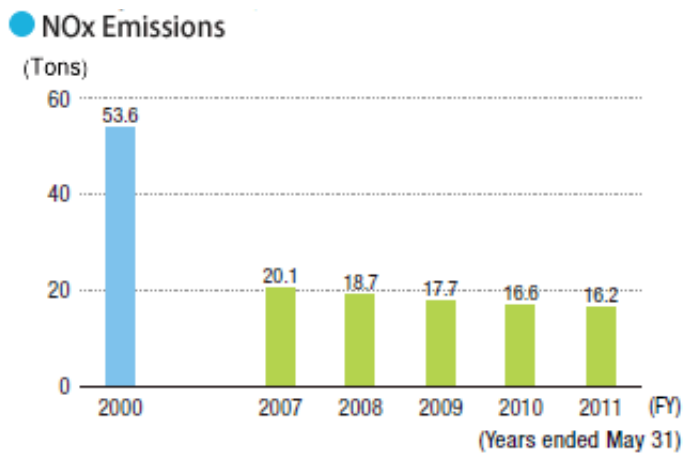
Our new medium-term environmental targets established in fiscal 2010 expand the scope of data compilation to include all chemical substances discharged into the atmosphere. The new scope includes chemical substances that are produced through reactions as well as the chemical substances conventionally subject to government ordinances and the Japan Chemical Industry Association voluntary standards. The target for VOCs is to reduce emissions into the atmosphere to less than 45 tons by fiscal 2020. The Nippon Kayaku Group stands committed to making the self-initiated efforts needed to achieve this target.

Under the initiative of the Japan Chemical Industry Association, the industry is taking action to voluntarily manage and reduce emissions of 12 control substances*5 that are deemed to be harmful air pollutants. Of these 12 control substances, we still use five, but stopped the use of benzene in 1995. Emissions of chloroform and ethylene oxide, on the other hand, have been cut to zero since fiscal 2007. Emissions of dichloromethane had also been cut to zero since fiscal 2007, but in fiscal 2010, dichloromethane emissions amounted to 3.3 tons, which increased a further 7.8 tons in fiscal 2011. Formaldehyde emissions totaled 0.03 tons in fiscal 2010 and remained unchanged in fiscal 2011. Going forward we will focus particularly on reducing the use and emissions of dichloromethane and formaldehyde.

Air pollutants sulfur oxide (SOx)*6 and nitrogen oxide (NOx)*7 are emitted during boiler operations. To date, the Nippon Kayaku Group has gradually shifted the fuel for its boilers from Bunker C heavy oil with high sulfur content to other lower sulfur content fuels such as Bunker A, in addition to LPG and natural gas, which are sulfur free. We continued this transition in fiscal 2011 as well. Since fiscal 2008, we have successfully made significant reductions in our SOx emissions, and in fiscal 2011 we made further reductions. The Nippon Kayaku Group remains firmly committed to reducing its air pollutant emissions further through proper maintenance practices as well as regular inspections and upkeep.



*5 12 control substances subject to voluntary controls: acrylonitrile, acetaldehyde, vinyl chloride monomer, chloroform, 1,2-dichloroethane, dichloromethane, tetrachloroethylene, trichloroethylene, 1,3-butadiene, benzene, formaldehyde, and ethylene oxide.



*6 SOx (sulfur oxide): SOx is emitted when fossil fuels that contain sulfur are burned. SOx reacts with water in the atmosphere to form sulfuric acid and sulfurous acid, which are causes of air pollution and acid rain.

*7 NOx (nitrogen oxide): NOx is produced when burned chemical substances react to nitrogen in the air and when fuels and chemical substances that contain nitrogen compounds such as coal are burned. Not only is it a major cause of air pollution including photochemical smog and acid rain, but NOx also has a harmful effect on the human respiratory system. In addition, NOx is also known to include the greenhouse gas dinitrogen monoxide.

*8 Dust: Dust mainly refers to fine particulate soot found in dust smoke produced when burning fossil fuels. In addition to a major

cause of air pollution, humans can contract pneumoconiosis or other harmful health conditions when breathing dust in high concentrations.

Preventing Water Pollution

The Nippon Kayaku Group has set voluntary wastewater discharge control standards that are tougher than requirements laid out in national laws and local ordinances.

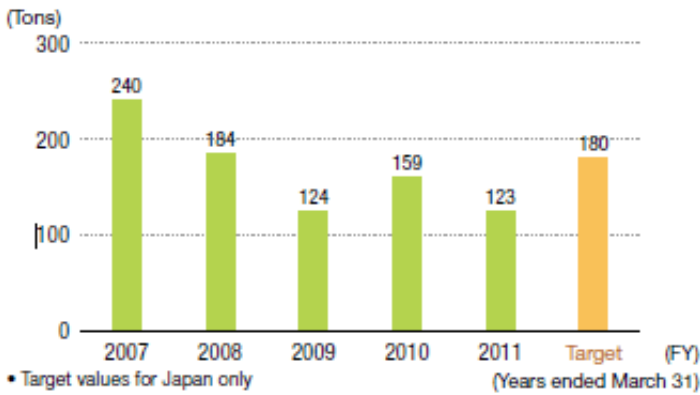
The Nippon Kayaku Group has made efforts to reduce its COD emissions by employing activated sludge treatment equipment at plants with high levels of COD emissions. During fiscal 2010 COD emissions increased to 159 tons due to the effects from changes in our production mix. In fiscal 2011, however, COD emissions returned to fiscal 2009 levels at 123 tons. At the same time, nitrogen emissions also increased to 170 tons in fiscal 2010, but thanks to our reduction efforts nitrogen emissions were reduced down to 138 tons in fiscal 2011.

The Nippon Kayaku Group produces color material-related products including dyes and ink jet printer ink, among others. Our Tokyo and Fukuyama plants, where color material-related products are manufactured, fully decolorize colored wastewater before it is discharged.

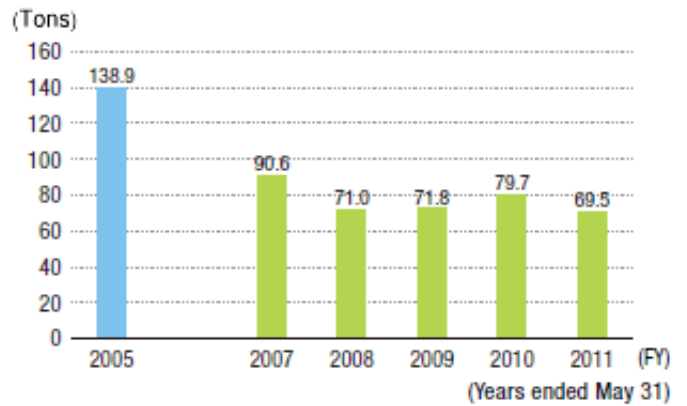
PRTR*9 Initiatives

Since 1995, the Nippon Kayaku Group has participated in the Japan Chemical Industry Association led initiative to reduce compounds identified in the PRTR regulation, working to reduce its emissions of PRTR controlled compounds into the environment. In fiscal 2011, our emissions of PRTR controlled substances totaled 32.5 tons, which marked a 17% decrease from 39.3 tons in the previous year. Although toluene continues to represent the largest source of PRTR controlled emissions, toluene emissions decreased from 17.4 tons in fiscal 2010 to 9.6 tons in fiscal 2011. The rate of toluene emissions also decreased from 43% of the total.

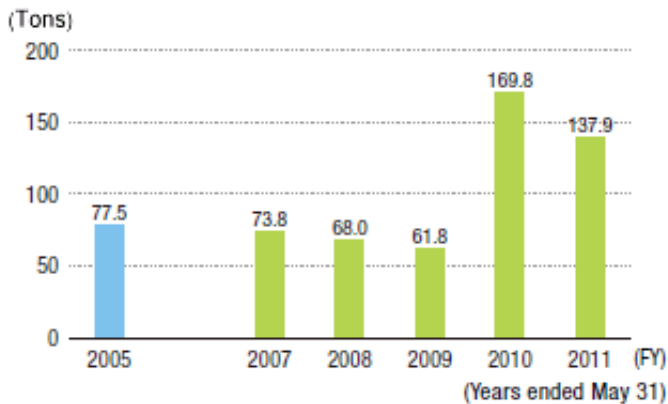
● COD Emissions



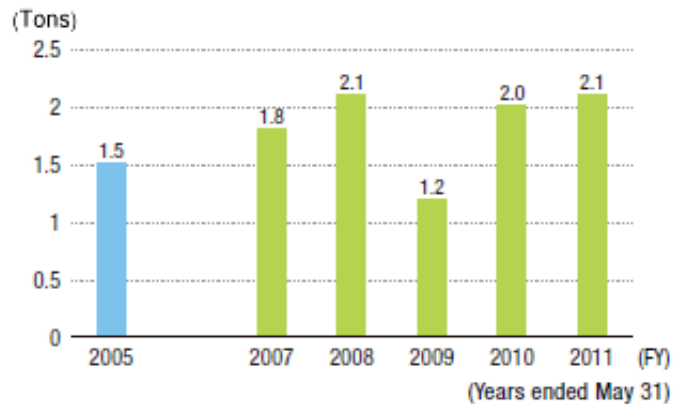
● SS*10 Emissions



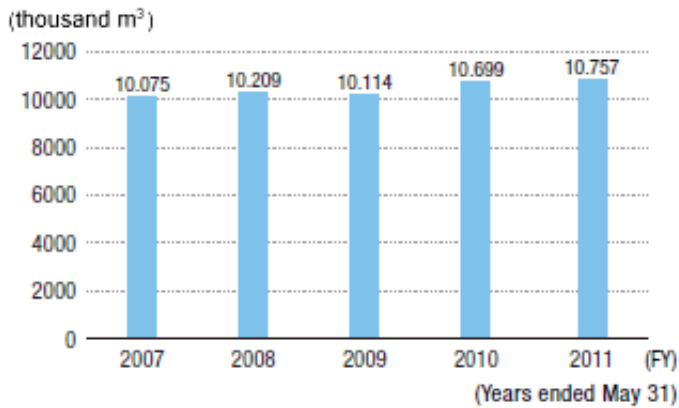
● Nitrogen Emissions



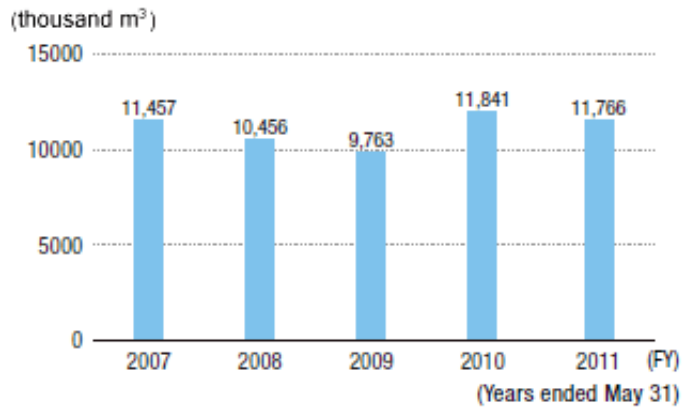
● Phosphorous Emissions



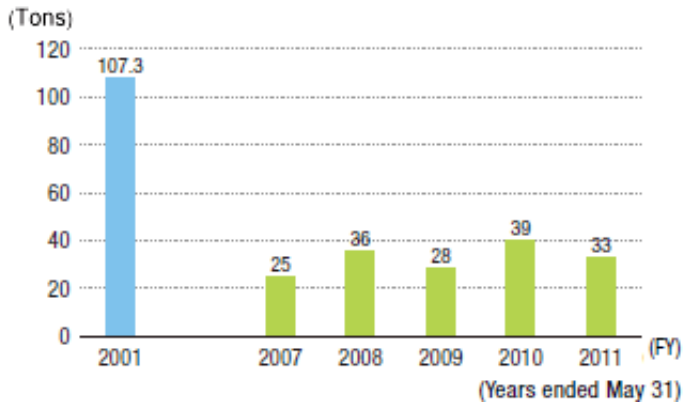
● Water Consumption



● Drainage



● Emissions of PRTR Controlled Substances



- *9 PRTR: Pollutant Release and Transfer Register. The PRTR regulation is designed to prevent occurrences of environmental safety incidents by encouraging businesses to improve their own chemical substance management.
- *10 SS: Suspended Solids. SS is a water-quality indicator generally referring to insoluble substances of 2 mm or less in diameter suspended in water. The organic matter and metal originating in particulate-like mineral, animals-and-plants plankton and its corpse, a sewer, factory effluent, etc. are contained. The increase in SS worsens transparency, and influences underwater photosynthesis by preventing light penetration.

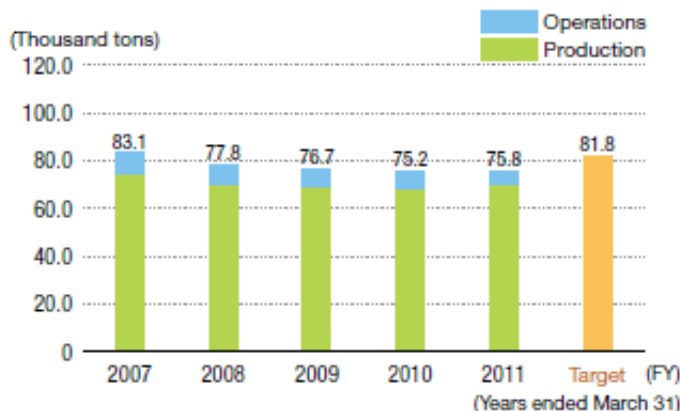
Preventing Global Warming

Each of our plants has implemented various energy conservation activities that have helped to reduce our total energy consumption annually. This, in turn, has reduced our energy derived CO₂ emissions as well, with such emissions totaling 75.8 thousand tons in fiscal 2011, which can be broken down into 69.9 thousand tons from production divisions and 5.9 thousand tons from operating divisions. Overall emissions increased only slightly over fiscal 2010 due to the impact from an increase in the CO₂ emission coefficient.

Nippon Kayaku has instituted a third-party logistics system (3PL) as part of its distribution reforms started in fiscal 2003. Today, we are working closely with our 3PL provider to change the modes in which our products are transported. We also began collecting data on CO₂ emissions emitted during product transport in April 2009. This modal shift will enable us to continue to reduce our energy consumption as well as CO₂ emissions.

As part of its efforts to help reduce CO₂ emissions from homes, the Nippon Kayaku Group has established two programs to encourage employees to conserve energy at home called My Family's Environmental Impact Budget and My Home is Currently Conserving Electricity, which focuses exclusively on electricity usage.

● Energy Derived CO₂ Emissions



● CO₂ Emissions during Product Transport and Distribution Volume

	CO ₂ Emissions (tons)	Distribution Volume (1,000 tkm)
fiscal 2010	3.3	18,407 18,407
fiscal 2011	3.1	16,692 16,692

• Ton-kilometer: weight (tons) x transport distance (kilometers)

- CO2 emissions are calculated according to the following methods.
Trucks Improved Ton-Kilometer Method
JR Containers Conventional Ton-Kilometer Method

Rolling Out Eco-friendly Sales Vehicles

Information on efficacy and safety is essential to ensuring that patients use our pharmaceutical products correctly. Nippon Kayaku stations medical representatives (MR) throughout Japan in order to gather and provide information on our proprietary pharmaceuticals by visiting medical institutions in person. All of the 285 company-owned sales vehicles used by these MR in their daily visits were recently switched over to eco-friendly hybrid vehicles, with the exception of colder weather areas requiring all-wheel drive.

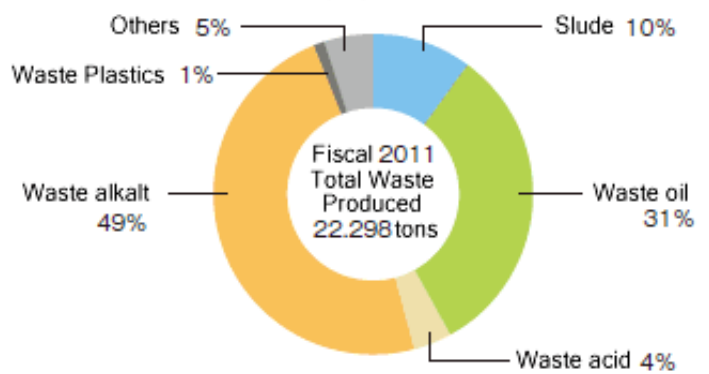
Waste Reduction

In fiscal 2011 the Nippon Kayaku Group produced 22,298 tons of waste, which represents a 15% decrease compared to fiscal 2010. Landfill waste in fiscal 2011 amounted to 2,917 tons, an 8% reduction from fiscal 2010, which also means we have increased our zero emissions rate thanks to our waste reduction efforts. Going forward, the Nippon Kayaku Group will continue to reduce its output of waste as part of its new Mid-term Corporate Master Plan for the Environment running up to fiscal 2020. As part of this, targets have been set for activities aimed at increasing our recycling rate and achieving zero emission.

● Total Waste Produced and Ratio of Landfill Waste



● Breakdown of Waste by Type



Noise Prevention

We conduct our business with a conscious effort toward minimizing noise pollution in the areas surrounding our factories. We regularly measure noise levels around our factories, making every effort to be a positive member of the local community. As such, any feedback or requests that we receive from local residents at company-sponsored events such as community round-tables are treated with the utmost priority. We also conduct regular work environment measurements in the factory to protect our employees from excessive noise.