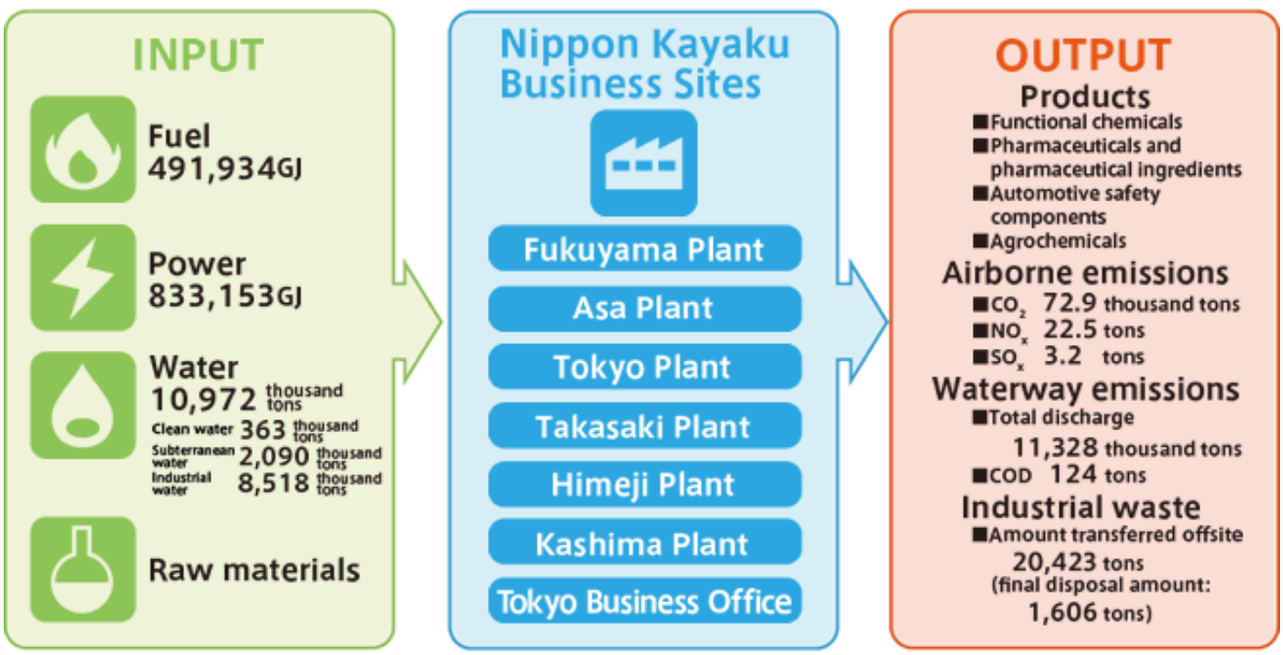
Reducing Our Environmental Impact

Energy and Material Balance

We are currently implementing initiatives that will help us achieve our mid-term environmental targets for fiscal 2020.
Fiscal 2012 is the period from April 1, 2012 to March 31, 2013.

● Overview of business activities and environmental impacts



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 2012 was the second year of this plan.

● Mid-term Corporate Master Plan for the Environment (FY 2011 - FY 2020)

		Target value	FY 2012	
Reducing Our Chemical Substance Footprint	VOC*1 Emissions	Under 45 tons	81.4 tons	Reduced by 11.1% compared to fiscal 2011.
	COD*2 Emissions	Under 180 tons	124 tons	Unchanged from fiscal 2011.
Prevention of Global Warming	Energy Derived CO_2 Emission*3 (Production Divisions+ Operation Divisions)	More than 15% reduction	72.9 tons	CO_2 emissions were reduced by 3.8% compared to fiscal 2011. This represents a 24.2% reduction compared to fiscal 1990.
Reduction of Waste	Total Waste Produced	Under 30,000 tons	20,423 tons	Reduced by 8.4% compared to fiscal 2011.
	Recycling Rate	More than 70%	61.8%	Reduced by 1.7% compared to fiscal 2011. We have worked diligently to raise the recycling rate, but it dropped somewhat in fiscal 2012 after a reduction in the amount of organic solvents used.
	Zero Emission Rate*4	Under 3%	7.9%	We continue with our efforts to reduce landfill waste.

*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 Energy-derived CO_2 emissions: 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.

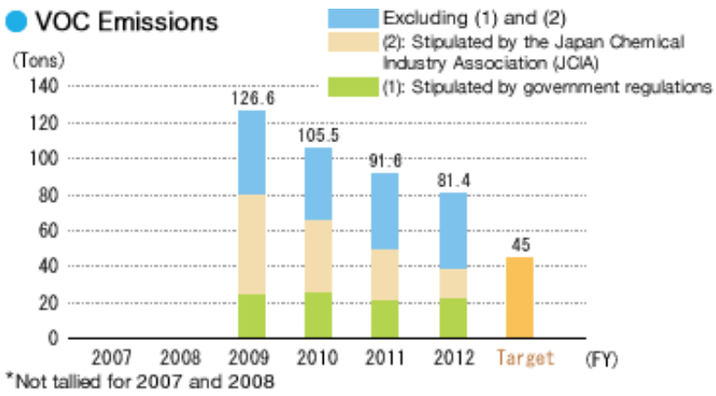
Preventing Air Pollution

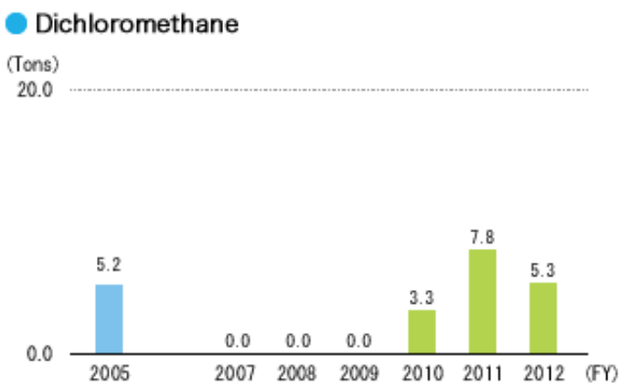
To help prevent air pollution, we carefully manage substances subject to Japan's Air Pollution Control Act, hazardous substances released into the air and other air pollutants.

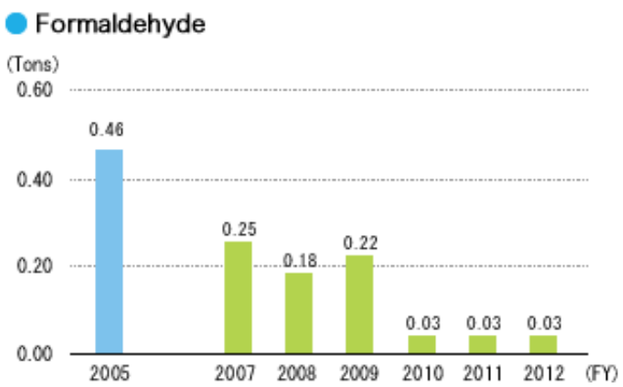
As for our VOC emissions reduction efforts, our new medium-term environmental targets established in fiscal 2011 expand the scope of data compilation to include all chemical substances discharged into the atmosphere. The new scope includes chemical substances that are produced through reactions as well 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. Dichloromethane emissions had been zero since fiscal 2007, but rose to 3.3 tons in fiscal 2010 and 7.8 tons in fiscal 2011, and we were able to reduce these emissions to 5.3 tons in fiscal 2012. Formaldehyde emissions totaled 0.03 tons in fiscal 2010 and remained unchanged in fiscal 2011 and fiscal 2012. Going forward we will focus particularly on reducing the use and emissions of dichloromethane and formaldehyde.

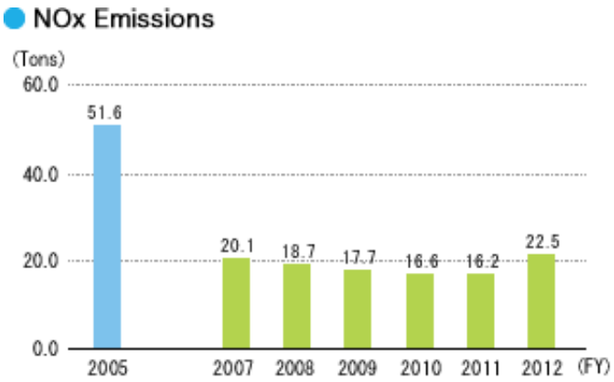
Air pollutants sulfur oxide (SOx)*6 and nitrogen oxide (NOx)*7 are emitted during boiler operations. To date, the Nippon Kayaku Group has gradually shifted the fuel for its boilers from Bunker C heavy oil with high sulfur content to other lower sulfur content fuels such as Bunker A, in addition to LPG and natural gas, which are sulfur free. We continued this transition in fiscal 2012 as well. Since fiscal 2008, we have successfully made significant reductions in our SOx emissions, and in fiscal 2012 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.

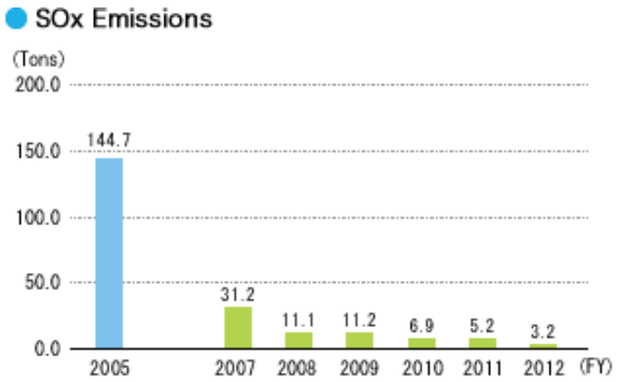


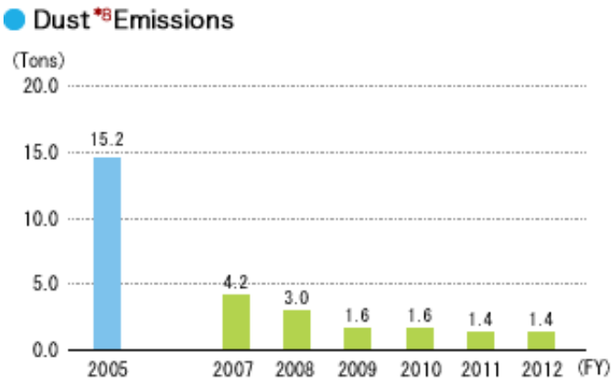




*5 12 control substances subject to voluntary controls: acrylonitrile, acetaldehyde, vinyl chloride monomer, chloroform, 1,2-dichloroethane, dichloromethane, tetrachloroethylene, trichloroethylene, 1,3-butadiene, benzene, formaldehyde, and ethylene oxide.







*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.

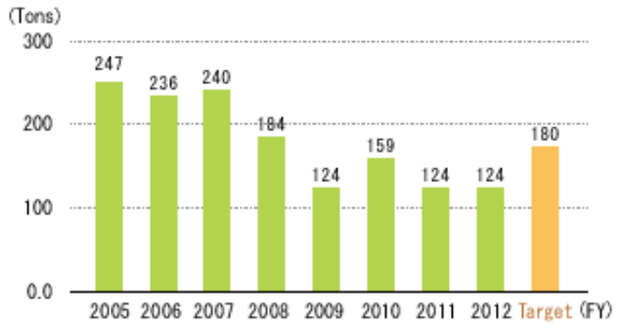
The Nippon Kayaku Group has made efforts to reduce its COD emissions by employing activated sludge treatment equipment at plants with high levels of COD emissions. During fiscal 2010 COD emissions increased to 159 tons due to the effects from changes in our production mix. In fiscal 2011 and fiscal 2012, however, COD emissions returned to fiscal 2009 levels at 124 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 97 tons in fiscal 2012.

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.

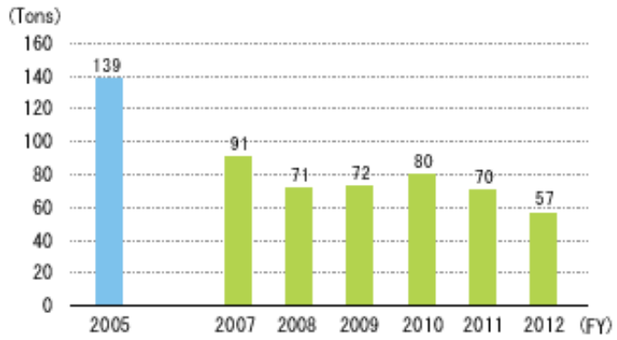
PRTR*9 Initiatives

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 2012, our emissions of PRTR controlled substances totaled 35 tons, which marked a 6% increase from 33 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 9.4 tons in fiscal 2012. The rate of toluene emissions also decreased from 43% to 27% of the total.

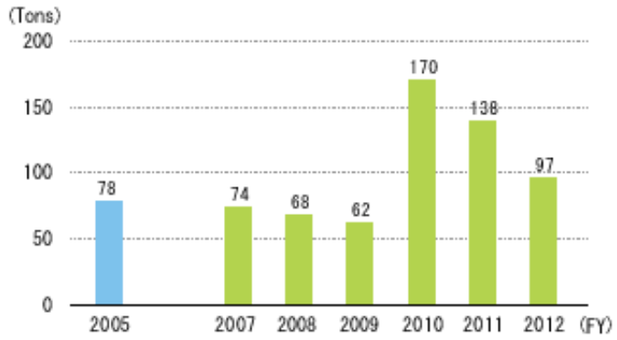
COD Emissions



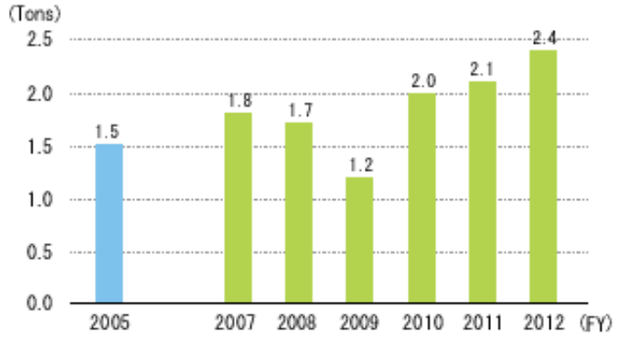
SS*10 Emissions



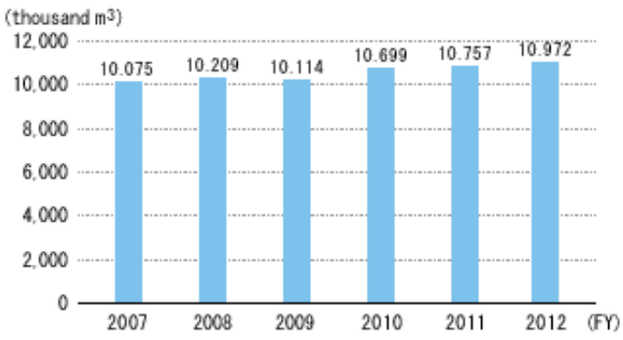
Nitrogen Emissions



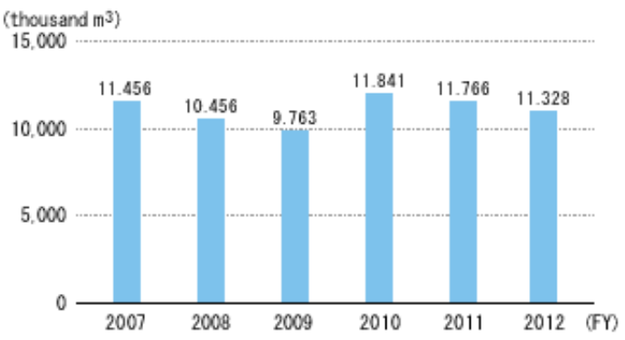
Phosphorus Emissions



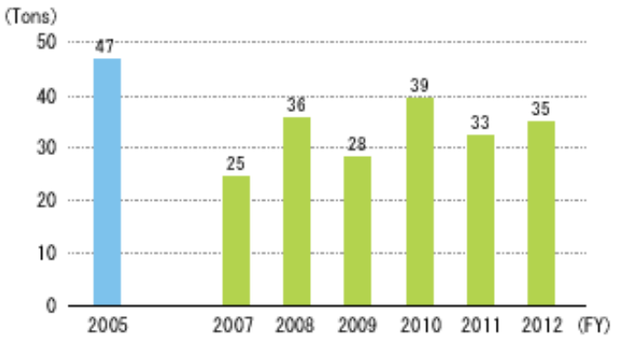
Water Consumption



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.

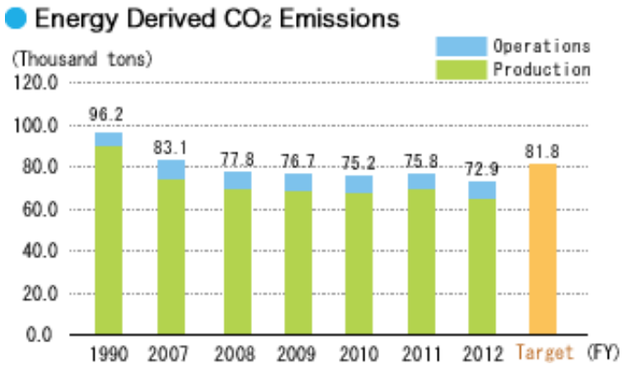
Preventing Global Warming

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 CO_2 emissions as well, with such emissions totaling 72.9 thousand tons in fiscal 2012, which can be broken down into 66.0 thousand tons from production divisions and 6.9 thousand tons from operating divisions. Overall emissions decreased over fiscal 2011.

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 CO_2 emissions emitted during product transport in April 2009. This modal shift will enable us to continue to reduce our energy consumption as well as CO_2 emissions.

As part of its efforts to help reduce CO_2 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.



CO_2 Emissions during Product Transport and Distribution Volume

	CO_2 Emissions (tons)	Distribution Volume (1,000 tkm)
Fiscal 2010	3,100	16,692
Fiscal 2011	3,090	16,809

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

Aiming to be a Company that uses Less Energy

Nippon Kayaku established the Energy Conservation & Global Warming Prevention Committee led by the president to roll out company-wide initiatives to help it achieve the provisional mid- to long-term environmental target of reducing greenhouse gas emissions 15% compared to 1990 by fiscal 2020. As part of this effort, we are working diligently to further reduce energy-derived greenhouse gas emissions.

Furthermore, the power supply problems caused by the Great East Japan Earthquake that struck on March 11, 2011 have inspired us to promote a company-wide project with the goal of becoming a company that uses less energy and can withstand power supply instability.
This project was recently concluded after a specific framework for initiative was developed. The next step of this process will be to promote activities as part of the efforts of the Energy Conservation & Global Warming Prevention Committee.

- Study on Energy Conservation Activities from Fiscal 2012 PDF

Themes of Initiatives

1. Change power systems to build a stronger foundation for energy conservation

The Takasaki Plant installed and began operating a CGS* in June 2013 that can produce about one-third of its electricity needs from Tokyo Electric Power Company.
We completed the review process for emergency back-up generators at our other plants.
In addition, we changed electricity suppliers at certain business sites, excluding plants, to achieve a stable power supply unaffected by the operating situation of Japan's nuclear power plants.
* CGS: Co-generation system that produces electricity using gas as well as collects and reuses resulting heat emissions

2. Promote existing energy conservation and global warming prevention theme

In fiscal 2012 we improved our specific energy consumption by 1.5% compared to fiscal 2011 and total energy usage was down 4.9% year on year thanks to our promotion of these energy conservation themes.

3. Create energy conservation master plan to achieve ideal vision for plants

We are preparing mater plans to reduce energy usage with an eye on the future vision for our plants. Going forward, we will periodically revise these plans as part of our ongoing efforts to reduce our specific energy consumption and greenhouse gas emissions.

4. Formulate new energy conservation themes based on a statistical analysis of energy usage at our plants

We performed a statistical analysis on plants that have completed the collection of necessary data and verified the main factors behind their use of energy in order to begin a review into ways that we can reduce this energy usage. As for plants still collecting this data, we will perform a statistical analysis as soon as it becomes available and work to narrow the scope of this theme.

5. Devise evaluation method for energy usage at the time of research and development when developing new environmentally friendly products

We have created a system during the initial research and development stage where researchers perform energy usage evaluations on the manufacturing process under development. Although this system is still in its infancy, the fact that researchers are performing these evaluations has raised their awareness of energy conservation, which is expected to have positive effects on the development of energy efficient production processes.

2012 Award for Excellence in Energy Management from the Director-General of the Kanto Bureau of Economy, Trade and Industry
Nippon Kayaku Tokyo Co., Ltd.

This award is presented to plants and business sites that rationalize energy usage and have achieved significant results from continuous efforts to promote energy management that can be used as a good practice by others.
On this occasion, representatives from the Kanto Bureau of Economy, Trade and Industry, Kanto Regional Electricity Usage Rationalization Committee, and Tokyo Regional Electricity Usage Rationalization Committee visited the plant to see our energy conservation initiatives at work.

We had previously been recognized with an award of excellence and grand prize from the Kanto Regional Electricity Usage Rationalization Committee, but it had never crossed our mind that we would receive such a great honor as this award. As it turns out we were both shocked and overjoyed. The plant's energy conservation initiatives are promoted using a top-down approach and represent many years of our employees' collective efforts to help streamline our energy usage. Winning such a grand distinction as the Award for Excellence in Energy Management from the Director-General of the Kanto Bureau of Economy, Trade and Industry both validates our initiatives and results, and will serve as motivation for our future efforts.

Energy Conservation Initiatives at the Plant

- Reduced electricity usage by changing volume of compressors for processors and instrumentation and through improvements in operational controls.
- Reduced electricity usage by improving operational control methods of industrial water pumps.
- Reduced energy usage by replacing mercury lamps with high efficiency lighting.
- Rolled out eco jacket solution for steam line valves.
- Our energy saving practices were highlighted on other company's websites.
- Made our efforts known through energy conservation broadcasts and email.

The plant is subject to the specific greenhouse gas emissions program of the Tokyo Metropolitan Ordinance on Environmental Preservation and as such we will focus even greater efforts on our energy conservation activities moving forward. Everyone at Nippon Kayaku Tokyo will continue to proactively work toward achieving energy conservation goals, knowing that these efforts also result in cost savings.

Awards ceremony (left)
President of Nippon Kayaku Tokyo Co., Ltd. and everyone from the Engineering Department (right)

Rolling Out Eco-friendly Sales Vehicles

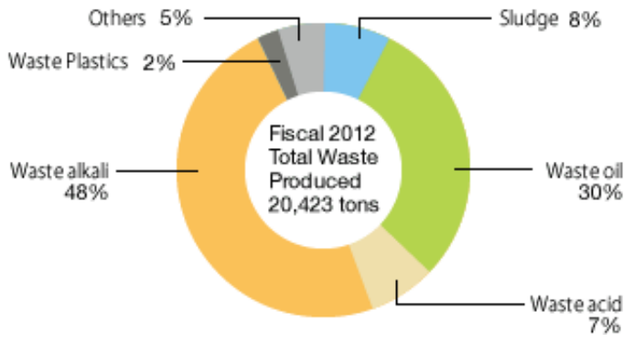
Information on efficacy and safety is essential to ensuring that patients use our pharmaceutical products correctly. Nippon Kayaku stations medical representatives (MR) throughout Japan in order to gather and provide information on our proprietary pharmaceuticals by visiting medical institutions in person. All of the 327 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 2012 the Nippon Kayaku Group produced 20,423 tons of waste, which represents an 8.4% decrease compared to fiscal 2011. Landfill waste in fiscal 2012 amounted to 1,606 tons, a 45% reduction from fiscal 2011. Going forward, we will continue with 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.

Environmental Accounting

Nippon Kayaku has tracked and shared all cost data associated with its environmental protection initiatives since fiscal 2000. Also, from fiscal 2003, we began calculating the returns from our environmental protection initiatives. Calculation of environmental costs and returns are made according to Environmental Accounting Guidelines (2005 Version) published by the Ministry of the Environment of Japan, and Environmental Accounting Guidelines for Chemical Companies published by the Japan Chemical Industry Association.

Environmental Protection Costs

(Millions of yen)

Category			Investment	Total	Main Activities
Cost Incurred in the Workplace	Pollution Prevention Cost	Air Pollution Prevention	129. 7	118. 1	Replaced waste fluid incinerator, reinforced VOC countermeasures, shifted heating medium furnace to gas-fired unit
		Water Pollution Prevention	33. 5	211. 3	Replaced bio-decolorization tower and waste water treatment facilities Replaced pumps, piping and flow meters
		Underground seepage prevention	11. 4	23. 0	Switched to aboveground waste liquid storage tank, lined pit underground water supply pit, made improvements to drainage channel
		Noise and Vibration Prevention	0. 5	0. 1	Installed silencer on isolation tower
		Other		9. 9	Pollution load amount levy
	Global Environment Cost	Global Warming Prevention and Energy Conservation	574. 3	1. 9	Replaced HVAC, switched transformers to top runner, installed brine chiller unit
	Resource Recycling Cost	Waste treatment	0. 8	465. 5	In-house processing costs and processing outsourcing costs
Up- / Down-Stream Cost	Container Recycling Outsourcing		–	0. 5	Outsourcing costs for repackaging products and cleaned and recycled product containers
	Sewage Processing Cost		–	102. 8	Sewerage treatment costs
Management Activity Cost	System Maintenance and Operation		–	120. 3	Internal auditor development cost and ISO14001 renewal costs
	Environmental Stress Monitoring		–	48. 2	Analysis costs and outsourcing costs
	Information Disclosure		–	4. 2	Outsourcing costs for preparing information disclosure documents on the environment
	Education, Training and Other		–	54. 3	Workplace training, etc.
	Greening		13. 4	115. 7	Added plants and improved some greenery along the roadway
R&D Cost				287. 3	Environmentally friendly R&D costs and wastewater treatment technology development costs
Social Activity Cost			–	9. 1	Plant tours, community event sponsorship, responsible care, ICCA special committee, LRI research meeting costs
Environmental Damage Cost			–	0. 0	
Total			763. 6	1, 572. 2	

Return from Environmental Protection Initiatives

(Millions of yen)

Sources of Return			Cost Reduction Return	Main Activities
Workplace	Pollution Prevention Return	Air Pollution Prevention	0. 1	Shifted boilers and deodorizing furnace fuel to LNG
		Water Pollution Prevention	0. 0	Improved wastewater treatment capacity by installing ultrafine aeration tubes
		Pollution Load Levy Reduction	0. 1	
		Noise and Vibration Prevention	0. 0	
	Global Environment Return	Global Warming Prevention and Energy Conservation	146. 4	Changed to high-efficiency HVAC system, reduced lost heat dissipation from steam, restricted the number of compressor units
	Resource recycling return	Reduction of Waste	12. 1	Recycled waste oil as combustion improver
		Sale of Recycled Resources	14. 5	Metal recovery, external sales of paper products, external sales of waste plastics
		Other	1. 6	Made changes to waste treatment providers
Up- / Down-Stream	Container Recycling		9. 5	Reused drums, etc.
Others			4. 7	
Total			189. 0	

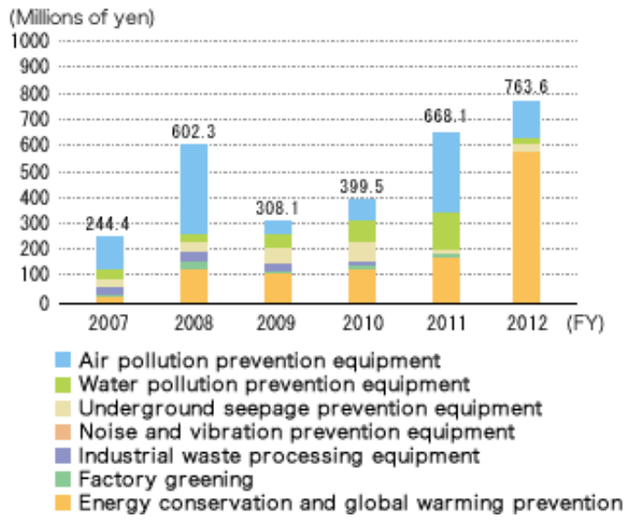
- Scope: Nippon Kayaku (non-consolidated)
- Capital expenditure: Compilation of capital appropriated for orders in fiscal 2012 (June 2012 to May 2013)
- Management cost: Any cost increase resulting from change in fuel type or change in waste processing method that are deemed appropriate from an environmental perspective are recorded under this category each year for a period of five years from the date the change is first administered.
- From a financial accounting standpoint, earnings realized from environmental protection initiatives are recorded in the fiscal year in which such earnings are realized.
- Earnings such as expense reduction and environmental impact reduction that are not considered from a financial accounting standpoint are reported for five years from the date it is first realized.

Investments Related to the Environment, Health and Safety

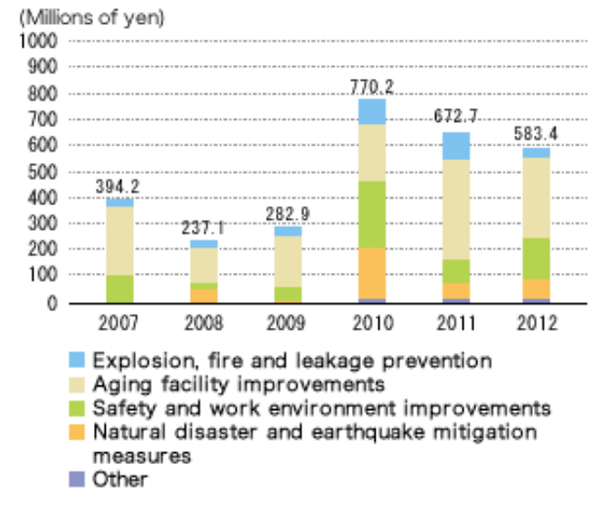
The Nippon Kayaku Group makes well planned and continual investments in environment, safety and health related projects. In fiscal 2012, investments related to the environment totaled 763.6 million yen, marking a 14% increase compared to fiscal 2011. Investments in energy conservation and global warming prevention accounted for 75% of the total, which was a major increase over the previous fiscal year.

Investments related to health and safety totaled 583.4 million yen in fiscal 2012, which was down 13% compared to fiscal 2011. Investments in measures to address aging facilities accounted for 52% of the total.

Environment Related Capital Investments



Safety and Health Related Investments



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