Reducing Environmental Impact of Production Activities

Pollution Prevention Subcommittee Activities

Shiro Endo
Senior Managing Director
Chairman, Pollution Prevention Subcommittee

Today there is an abundance of chemicals, more than ten thousand types, in use around the world. As exhibited by the various environmental issues we face, such as depletion of the ozone layer, the majority of problems these days arise from the emissions of these chemical substances into the environment. Furthermore, a new dilemma has cropped up, the issue of endocrine disruptors. To promptly deal with the emergence of new pollutants, we believe it is necessary to carry out full-scale risk management.

Here at Toyota Industries, we use a wide range of chemicals in our production activities. Thus far, we have built a management structure which aids in the reduction of chemical substances. To maintain our position as a good corporate citizen, we are working to strengthen our management of environmental pollutants and to continue reducing emissions. In addition, we place importance on communications with various members of society.

Chemical Management

Toyota Industries manages chemical substances from two different perspectives, input management (purchasing) and output management (emissions).

At the input management stage, to prevent pollution we have introduced a prior assessment system for environmental pollutants. In addition, at the output management stage, to reduce emissions we are implementing the management of mass balance for chemical substances designated under the PRTR system.*1

Prior Assessment System for Environmental Pollutants

In 1995, we began implementing a prior assessment system for environmental pollutants.

The assessment mainly covers sub-materials and chemical content, to guarantee safety and health during the use and disposal of such substances. To implement necessary policies, this evaluation is done prior to introduction of sub-materials. All substances that do not undergo assessment cannot be purchased, thereby helping to prevent illness among employees as well as environmental pollution.

In FY 2001, 372 prior assessments were conducted under this system.

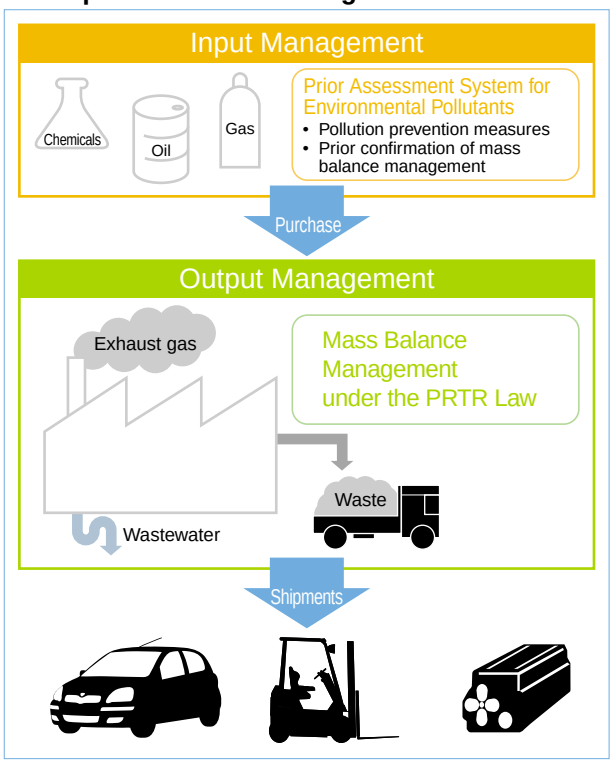
Mass Balance Management Based on the PRTR System

As a part of our plans to reduce the emissions of environmental pollutants, our target is to lower our total emissions of PRTR-designated substances by 50% in comparison with FY 1998 levels by March 2006.

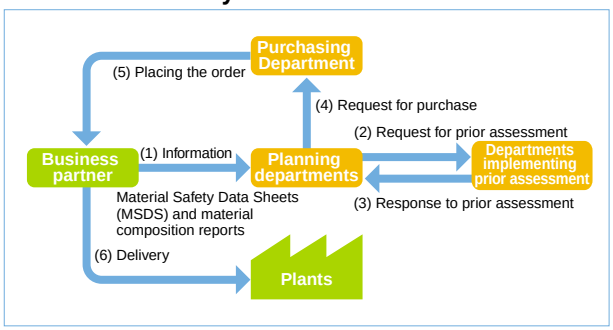
In FY 2001, our total emissions equalled 689 tons. Toluene and xylene, used during the painting process, accounted for 94% of total emissions. Thanks to measures implemented thus far, we succeeded in reducing VOC emissions by 35% compared to FY 2000.

We plan to continue reducing our emissions of environmental pollutants, mainly VOCs.

Concept of Chemical Management

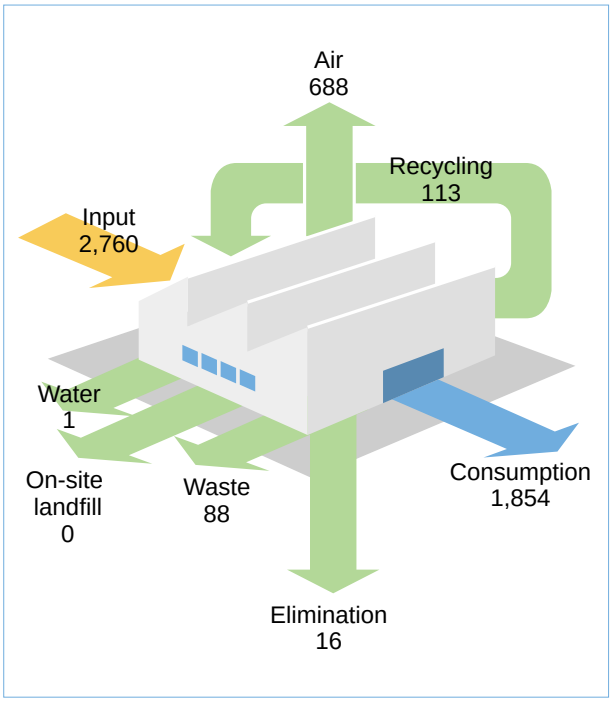


Prior Assessment System for Environmental Pollutants

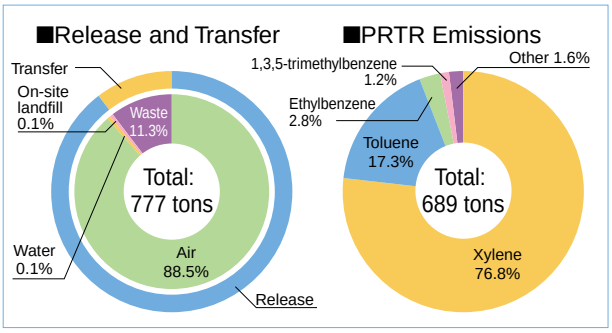


*1 PRTR system: Pollutant Release and Transfer Register. The Japanese PRTR law was enacted in July 1999. This system allows for the calculation and reporting of releases and transfers from the place of business. The manufacturer collects data on environmental releases of chemical substances thought to be hazardous to human health or to the ecosystem from its respective facilities. It also tracks transfers of such substances which may be contained in industrial waste shipped outside the site. This data is then reported to the government. The government uses this data to disseminate facts on pollutant release and transfer.

Mass Balance of PRTR-Designated Substances in FY 2001 (Unit: tons/year)

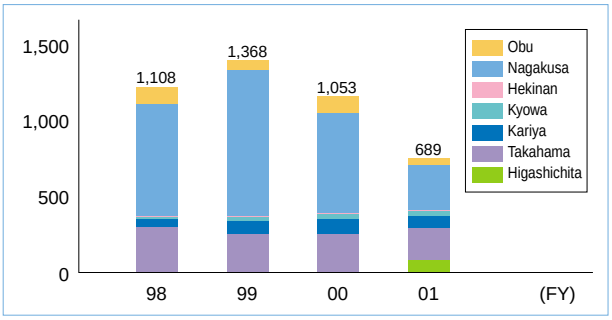


PRTR-Designated Substances Released and Transferred in FY2001



Releases of PRTR-Designated Substances

(Unit: tons/year)



Company-wide Total for the Release and Transfer of PRTR-Designated Substances

(Unit: kg/year, Dioxins: mg-TEQ/year)

Substance	Quantity	Releases					Transfers			Total for the Releases and Transfers	Amount Recycled	Amount Removed	Amount Consumed
		Air	Water	Soil	On-site landfill	Subtotal	Waste	Sewage	Subtotal				
Zinc compounds (water-soluble)	14,661	—	370	—	—	370	2,564	—	2,564	2,934	—	—	11,728
2-Aminoethan	1,094	—	—	—	—	—	—	—	—	—	—	1,094	—
Antimony and its compounds	17,022	—	—	—	—	—	—	—	—	—	—	—	17,022
Bisphenol A	5,000	—	—	—	—	—	—	—	—	—	5,000	—	—
Bisphenol A type epoxy resin	6,151	—	—	—	—	—	706	—	706	706	—	—	5,444
Ethylbenzene	47,275	21,660	—	—	—	21,660	—	—	—	21,660	3,714	—	21,901
Ethylene glycol	767,438	1,650	—	—	—	1,650	862	—	862	2,512	—	—	764,926
Xylene	791,472	528,811	—	—	—	528,811	43,569	—	43,569	572.380	76,631	11,864	130,596
Chromium and chromium (III) compounds	111,745	4	—	—	—	4	—	—	—	4	—	—	111,741
Organic tin compounds	3,763	—	—	—	—	—	—	—	—	—	—	151	3,612
Styrene	1,513	1,513	—	—	—	1,513	—	—	—	1,513	—	—	—
Dioxins	10	4	—	—	—	4	7	—	7	10	—	—	—
Hexamethylenetetramine	50,576	—	—	—	—	—	—	—	—	—	—	—	50,576
1,3,5-trimethylbenzene	9,554	8,121	—	—	—	8,121	—	—	—	8,121	1,433	—	—
Toluene	357,426	119,459	—	—	—	119,459	33,406	—	33,406	152,865	23,701	2,940	177,917
Lead and its compounds	4,432	—	—	—	—	—	—	—	—	—	2,231	—	2,201
Nickel	37,530	10	—	—	—	10	—	—	—	10	—	—	37,520
Nickel compounds	2,101	—	193	—	—	193	857	—	857	1,051	—	—	1,051
Phenol	15,134	2	—	—	—	2	—	—	—	2	—	—	15,132
Benzene	7,381	114	—	—	—	114	—	—	—	114	—	—	7,267
Poly (oxyethylene) alkyl ether (alkyl C=12-15)	6,910	—	102	—	—	102	4,347	—	4,347	4,449	—	102	2,359
Poly (oxyethylene) nonylphenyl ether	1,209	—	—	—	—	—	54	—	54	54	—	—	1,155
Formaldehyde	7,630	6,129	—	—	—	6,129	—	—	—	6,129	—	—	1,501
Manganese and its compounds	457,347	2	100	—	331	433	1,794	—	1,794	2,227	—	—	455,120
Molybdenum and its compounds	35,234	—	—	—	—	—	—	—	—	—	—	—	35,234

Note: See Environmental Data starting on page 40 for the release and transfer of PRTR-designated substances for each plant.

Reducing Environmental Impact of Production Activities

Reducing VOC*1 Emissions

A high level of VOC emissions is released during the painting process. In our Third Environmental Action Plan, our target is to reduce VOC emissions by 50% compared to levels in FY 1998 by March 2006.

In FY 2001, VOC emissions totalled 1,814 tons. This was 14% less than was released in FY 2000.

Activities in our Vehicle Division

■Introducing an Exhaust Gas Combustion System

In August 2001, our Vehicle Division installed an exhaust gas combustion system to reduce VOC emissions from the painting process. As a result, VOC emissions declined by 99 tons.

In addition, as VOC emissions are odorous, the furnace helped to reduce odor density significantly.

Activities in TOYOTA Material Handling Company

■Employing an Electrostatic Spraying Gun/ Low-Pressure Spraying Gun

From April to September 2001, ten low-pressure spraying guns were installed. Compared to conventional spraying guns, these new guns spray around 50% less paint and improve coating efficiency.

To improve coating efficiency further, an electrostatic spraying gun was introduced to paint forklift truck frames in January 2002.

By implementing these methods, VOC emissions were reduced by 12 tons annually.

■Expanded Use of Water-Soluble Paint

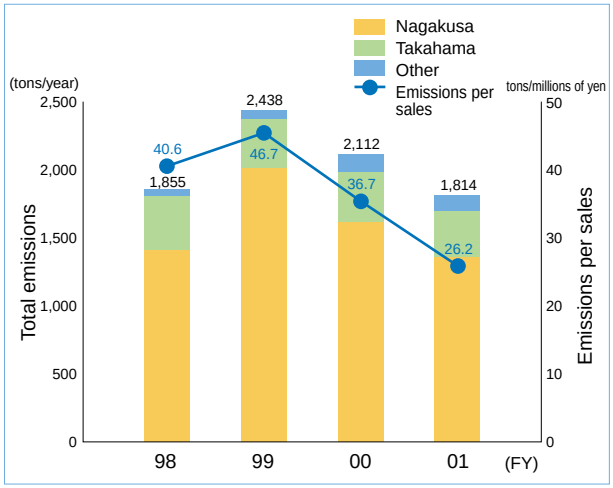
Since April 2000, we have promoted the use of water-soluble paints. In FY 2000, these paints were used to paint forklift trucks, and their use was then expanded to the painting of rear axles in April 2001. This contributed to reducing VOC emissions by about nine tons per year.

■Introduction of a Paint Flow Management System

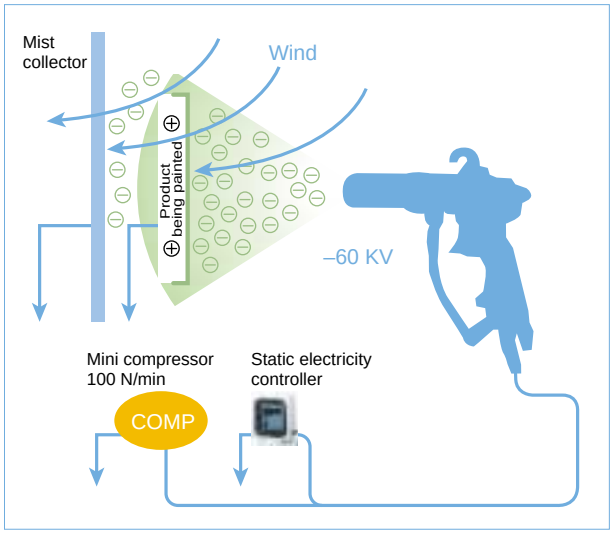
To fortify the management of paint usage and reduce loss, we introduced a paint flow management system in October 2001.

This system uses a sensor to detect the flow of paint during the coating process. The system is connected online to the company's PC network. As a result, it can be used to track the details of paint usage in real time. We plan to introduce the system to our key painting lines in the future.

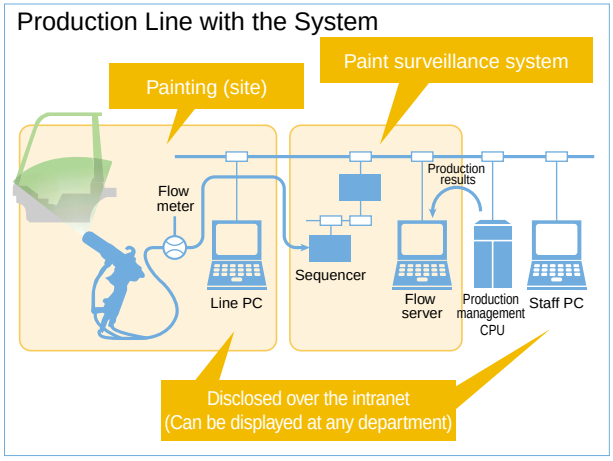
Total VOC Emissions



Principle of Electrostatic Spraying



Paint Flow Management System



*1 VOC: Volatile Organic Compound

Reducing Nickel Emissions

In addition to toluene and xylene, for which emissions are high, we independently conducted measures to reduce nickel compound emissions, which have a significant impact on the environment.

Nickel compounds are used in agents to prepare products for painting or plating. The wastewater released from the painting and plating processes therefore contains nickel compounds.

As a measure to reduce emissions to waterways, we installed a water treatment plant that specifically handles the treatment of wastewater containing nickel compounds in April 2001. As a result, the nickel compound concentration in our wastewater has decreased by 78.2% compared to levels prior to the introduction of these treatment facilities.

Nickel Processing Facility

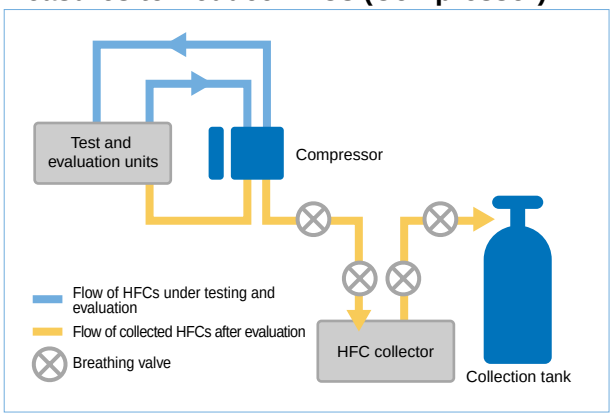
Reducing Hydrofluorocarbons (HFCs)

We use the CFC substitute HFC-134a*2 during the development of compressors and assembly of automobiles.

HFC-134a was introduced as an alternative to CFC-12, a specific substance that destroys the earth's ozone layer. As a key cause of global warming, if CO_2 were rated a 1 for its greenhouse effect, HFC-134a would be 1,300 times that. Because of this, even if emissions are small, its impact on the earth is extremely great.

Consequently, to help remedy this problem, we have installed devices that collect HFC emissions and work to curtail the emissions.

Measures to Reduce HFCs (Compressor)



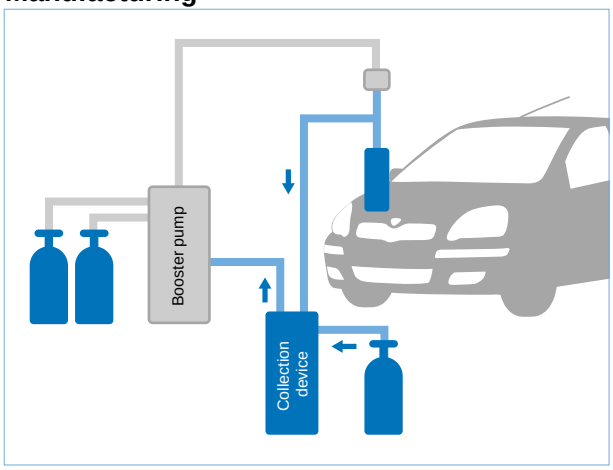
■Compressor Development

HFC-134a is used as a refrigerant at the performance and durability testing stages during the development of new compressors.

Typically after tests, refrigerant is discharged into the air. When converting this into CO_2, we were emitting 7,500 tons of CO_2 into the air every year.

In April 2001 we launched a collection device and began retrieving the used HFCs from the air after the tests. When we converted these results into CO_2 emissions, we found that we had reduced emissions by around 2,600 tons of CO_2 per year. Treatment of the collected HFCs is consigned to a company for disposal.

HFC Collection and Reuse During Automotive Manufacturing



■Automotive Manufacturing

During the automotive manufacturing process, HFC-134a is used as a refrigerant in car air-conditioning.

Conventionally, the HFCs remaining in the piping were released into the air when refrigerant was poured into the air conditioners. This was equivalent to around 3,000 tons of CO_2 emissions per year. We inspected our facilities not only with the objective of preventing global warming but also for more efficient use of resources. As a result, in March 2002 we installed a collection device that collects HFCs for reuse. Using this device, we aim to reduce our emissions by 98%.

*2 HFC-134a: 1,1,1,2-tetrafluoroethane. It is designated as a green effect gas by the law concerning the promotion of the measures to cope with global warming.

Reducing Environmental Impact of Production Activities

Risk Management

Risk Communication Guidelines

The PRTR law was implemented in April 2001. We have begun reporting to governments on the release and transfer of designated chemical substances into the environment since April 2002. We started disclosing information on soil and groundwater treatment activities in April 2001.

As a result of these actions and the management review of our environmental management system, we drew up our Risk Communication Guidelines on April 1, 2002.

These guidelines call for active communication with interested parties, in particular local residents, to maintain our stance as a corporate citizen. The frequency with which we carry out our risk communication is also outlined in these guidelines.

We had held regular meetings to exchange opinions with local residents. In the future, in accordance with these guidelines, we plan to use the meetings to convey risk communication, report on our environmental conservation activities, and promote a better understanding of our efforts in the surrounding communities.

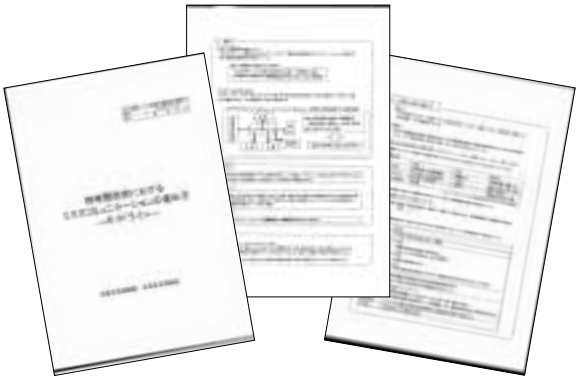
PCB Storage

PCBs*1 were used as insulation in transformers and condensers. PCBs are highly toxic and pose the risk of damage to internal organs. For these reasons, PCB usage was phased out in 1976.

The 600 transformers containing PCBs are securely locked away in a storage warehouse to prevent leakage. These transformers will be kept in storage until a sure-fire method of dealing with PCBs is developed.

PCB Storage Area

Risk Communication Guidelines



Outline of Risk Communication Guidelines

Presentations	Held at each site
Participants	The program is aimed at area representatives and government officials dealing with environmental issues.
Frequency	Presentations are given once a year (usually held in conjunction with the release of our environmental report)
Report on environmental conservation activities (by site)	• PRTR • Pollution prevention (measures to halt air, water, and soil pollution, etc.) • Update on environmental conservation activities

Our Continuing Report on Soil and Groundwater Measures

At the Kariya Plant in April 1998, and at the Kyowa Plant in March 1999, we began efforts to purify the groundwater under the guidance of the local government authorities. This purification project was due to the fact that we previously used trichloroethylene in our business operations.

We continue to implement measures to prevent off-site run-off and still use the pumping aeration method. We report our observations and results to local government authorities and residents on a regular basis.

In FY 2001, the average groundwater density at the Kariya Plant was 1.0 mg/ℓ and at the Kyowa Plant it was 2.9 mg/ℓ .

Compared to FY 2000, the average groundwater density remained unchanged year-on-year at the Kariya Plant, and decreased by 0.2 mg/ℓ at the Kyowa Plant. Slowly but surely we are seeing a gradual decline.

We aim to continue our purification measures and make regular reports on our progress.

*1 PCB: Polychlorinated Biphenyl

Pollution Prevention

Air Management*2

During the course of our business operations, sulfur oxide (SOx), nitrogen oxide (NOx), and other air pollutants are emitted into the atmosphere from our casting and smelting furnaces, boilers, and incinerators. To reduce these emissions, we introduced alternative fuels and installed removal devices.

In FY 2001, to prevent dioxin emissions, we disassembled and removed all of our incinerators.

Water Quality Management*2

Wastewater from our plants is discharged into nearby rivers. From there it flows into the Ise Bay, which currently suffers from eutrophication. In an effort to thoroughly prevent eutrophication of the waterways, we are conducting advanced wastewater treatment methods, such as the use of the simultaneous nitrification-denitrification process, and have fortified the analysis of in-house wastewater to detect substances such as nitrogen and phosphorous.

In FY 2001, automatic analytical devices were installed at the wastewater treatment facilities in the Takahama and Hekinan plants to detect nitrogen and phosphorous, to further strengthen our management of water pollutants.

Odor Prevention Measures

VOCs emitted during the coating process are air pollutants and also release bad odors.

Owing to the large-scale of coating processes carried out at the Kariya, Nagakusa, and Takahama plants, we are implementing various measures to control odor. (For activities conducted in FY 2001, see page 22, “Reducing VOC Emissions.”)

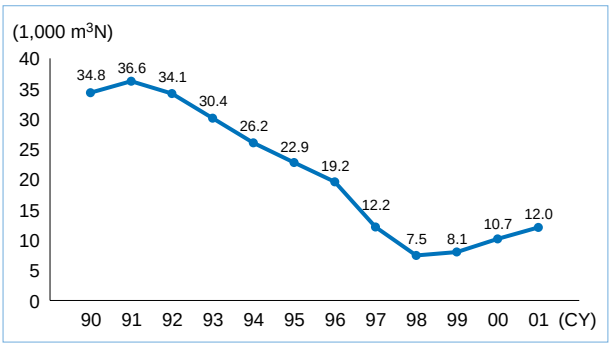
Noise Prevention Measures

The Nagakusa Plant, which assembles automobiles, is adjacent to a residential area. We have implemented various measures to curtail noise, such as the construction of soundproof walls.

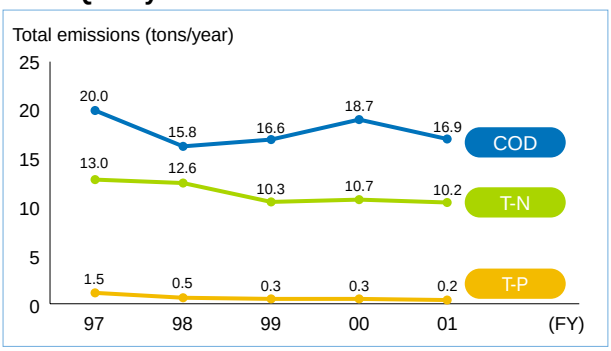
In FY 2001, to create a quieter environment, we promoted a variety of measures, twenty-eight in all, to pinpoint the source of the noise and resolve noise problems by repairing roads.

During the fiscal year, all of our plants managed to meet regulatory standards for noise pollution and we did not receive any complaints from local residents.

SOx Emissions



Water Quality



Noise Prevention Measures at the Nagakusa Plant in FY 2001

Item	Example	Cases
Facilities measures	• Soundproofing facilities • Installation of soundproof covers	14
On-site vehicle operation regulations	• Speed regulations • Installation of signs aimed at improving awareness	4
Revamping of distribution route	• Removing barriers • Change in materials used for grating	3
Improvements to work	• Review of work done outside • Review of the opening and closing of the shutter at the press factory	7

Examples of Noise Prevention Measures: Soundproof Wall

*2 For air and water pollution data, see page 40, "Environmental Data."

Reducing Environmental Impact of Production Activities

Energy Subcommittee Activities

Iwao Katayama
Senior Managing Director
Chairman, Energy Subcommittee

The recent high level of economic growth we have experienced as a legacy of the industrial revolution has resulted in a wealthy society, but the price we have had to pay are the global environmental issues we face today.

In particular, one of the most serious problems we face today is global warming. During 2002, the "Kyoto Protocol to the United Nations Framework Convention on Climate Change" is expected to be put into effect. We have come to realize that it is necessary for industry, governments and private corporations to work together to resolve these problems.

In 1993, we established specialized organizations and are working to reduce energy consumption, but there is still plenty of room for improvement.

As a chairman, I am working to review our present conditions, improve the level of environmental consciousness among our employees, make all workers fully aware, and promote effective activities.

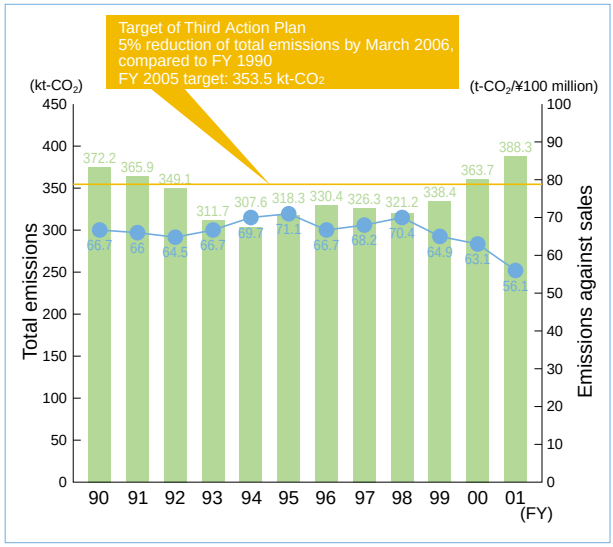
Reducing CO_2 Emissions*1

FY 2001 Results

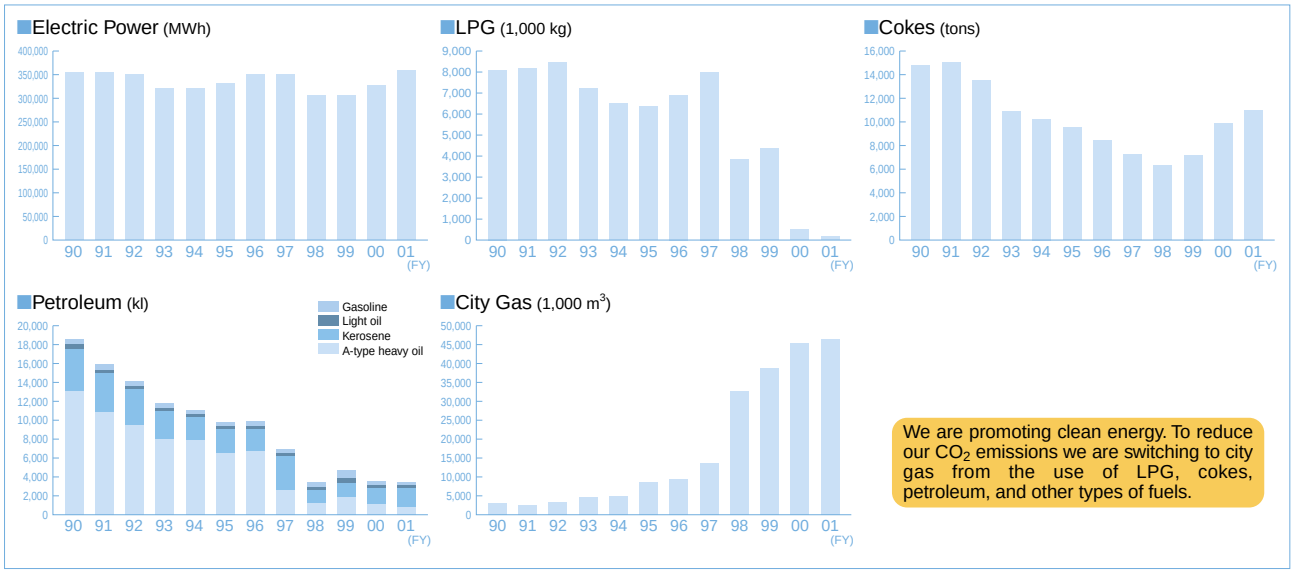
We aim to conserve energy to meet our target of a 5% reduction in total CO_2 emissions as compared with FY 1990 levels in our Third Environmental Action Plan.

In FY 2001, our energy conservation activities focused on the improvement of power supply and the reduction in energy loss in our production lines. In conjunction with an increase in production and the full-fledged operation of the Higashichita Plant, our total CO_2 emissions were 388.3 kt-CO_2, an increase of 24.6 kt-CO_2 over FY 2000, and a 4% rise over FY 1990. However, our CO_2 emissions per sales were 56.1 t-CO_2 /¥100 million, a decrease of 7 t-CO_2/¥100 million over FY 2000, and a 16% decrease over FY 1990.

CO_2 Emissions



Energy Consumption



*1 CO_2 Emissions: Carbon dioxide caused by the use of energy (electricity, gas, fuel). Up until our Environmental Report 2001, emissions were expressed using carbon conversion values, but from this edition onward we will use CO_2 conversion values.

Reducing CO_2 Emissions through Energy Conservation

FY 2001 Actions

In FY 2001, to enhance our power supply methods, we improved the efficiency of our air compressor and introduced a steam-powered air compressor. We reduced energy loss in our production lines through measures to prevent air leakage and through shutdowns between shifts and on holidays. In addition, improvements were made to production facilities.

In constructing the Higashiura Plant, one of our targets from the standpoint of preventing global warming was to reduce electric power consumption by 20% in comparison with the amount of electricity used by conventional plant facilities. To accomplish this, we introduced clean equipment and facilities such as solar and wind power generators to conserve energy. (For details on the Higashiura Plant, see pages 36-37.)

Improving Energy Conservation in FY 2001

■Installing Steam-Powered Air Compressor

In the Nagakusa Plant, we installed a steam-powered compressor to replace our old air compressor facilities. This steam-powered compressor utilizes the difference in pressure of the high pressure steam emitted by the cogeneration system to create air. As a result, the plant was able to reduce electric power consumption by 1,150 MW annually, or 760 t-CO_2 per year.

■Improving Production Facilities to Reduce Electric Power Consumption

In the Hekinan Plant, we use a coolant (oil) at the cutting stage during the processing of parts. By creating a more compact nozzle and performing head cleaning intermittently, we were able to reduce the coolant used. In addition, we could reduce the number of spray pumps. As a result, annual electric power consumption was reduced by 620 MW, or 410 t-CO_2 per year.

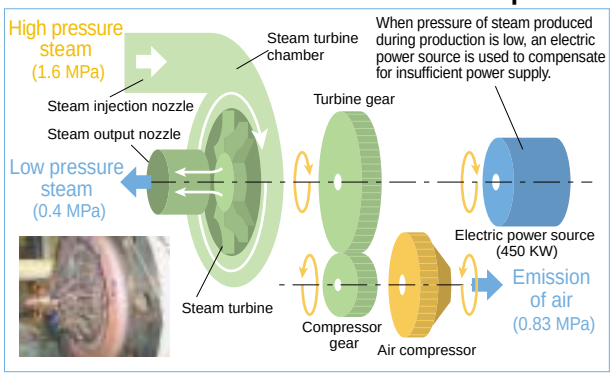
Future Actions

In FY 2002, at our Kyowa Plant, we plan to introduce a cogeneration system, minimize electric power loss during non-operating hours, and improve efficiency through the integration of production lines. In the future, we aim to aggressively work at conserving energy and reducing CO_2 emissions.

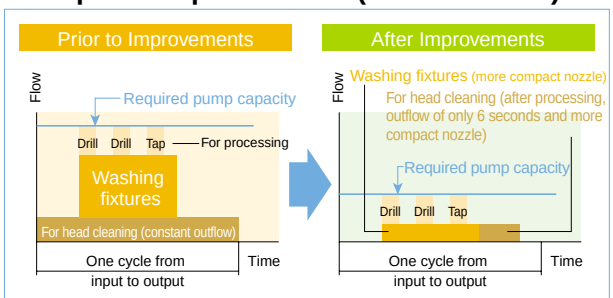
Key Energy Conservation Activities in FY 2001

Action	Details
Improving power supply methods	• Improving efficiency of air compressors • Introducing a steam-powered air compressor
Reducing energy loss in production lines	• Measures to prevent air leakage • Facilities shutdown between shifts and on holidays
Improving production facilities	• Better energy efficiency owing to shorter cycle time • Employing air blowers with nozzles which conserve energy • Converting to fluorescent lighting (phase out mercury lighting)
Surveying energy saving items by adopting a system to measure energy usage	• Introducing in-house examples (introduce horizontally throughout other divisions)
Introducing energy saving facilities at the Higashiura Plant	• Employment of micro gas turbine, solar power, and hybrid solar and wind street lamps • High efficiency air compressors

Structure of the Steam-Powered Air Compressor



Example of Improvements (Hekinan Plant)



By creating a more compact nozzle and performing intermittent head cleaning, we were able to reduce water usage/outflow and the number of pumps.

• Energy Conservation Month

December of every year is Energy Conservation Month. We ask employees to send in posters or to give us proposals for energy conservation. In FY 2001, 122 posters were sent in. Three were chosen for display in the office. This event helps to heighten awareness on energy conservation.

Reducing Environmental Impact of Production Activities

Resource Utilization Subcommittee Activities

Shinjiro Kamimura
Managing Director
Chairman, Resource Utilization Subcommittee

We must break away from our patterns of mass production, mass consumption, and mass disposal. By promoting the effective use of materials over the stages of production, consumption and ultimate disposal, or encourage recycling, we can help contribute to a recycling-oriented society that has minimal impact on the environment. This is one of the most important issues we face today. To achieve this, various laws including the "Basic Law for Establishing a Recycling-Based Society" have been established in Japan.

Since 1990, we have aggressively worked to reduce our waste emissions and have had significant success.

We will continue to promote our environmental activities. We plan to fortify our actions with the aim of maximizing and making the best use of our limited resources.

Reducing Industrial Waste and Proper Disposal

FY 2001 Results

In FY 2001, the total emissions of waste, including reusable materials and industrial waste, was 118,881 tons. Of this industrial waste accounted for 57,616 tons. Of this total industrial waste disposed of, 79% or 45,528 tons were reused or recycled, 9,721 tons were used in on-site landfills, 1,502 tons were intermediately disposed of by a third party and 865 tons were used as landfill outside the site.

During this period, owing to the start-up of operating at the Higashichita Plant which manufactures foundry parts, the company saw an increase in the amount of slag used as landfill.

In the future we plan to promote disposal measures for slag, which accounts for 80% of our industrial waste.

Aiming for Zero Emissions*2

■Phasing Out Direct Landfills*3 at Five Plants

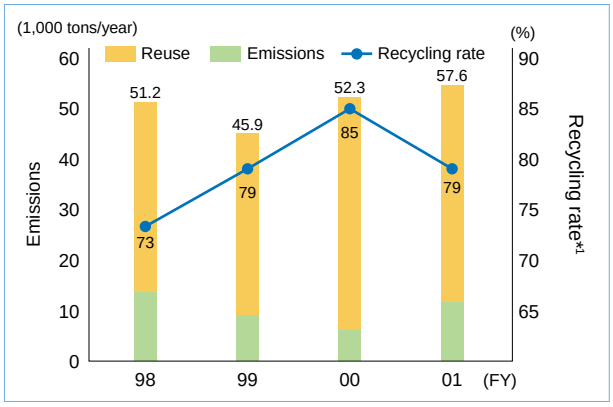
One of the targets stated in our Third Environmental Action Plan is elimination of direct landfills by FY 2003.

With few years of landfill life remaining, we realized that waste should not be seen as something to be discarded but rather as a material to be converted back into a resource. Reflecting this, we sought new methods to reuse or recycle waste.

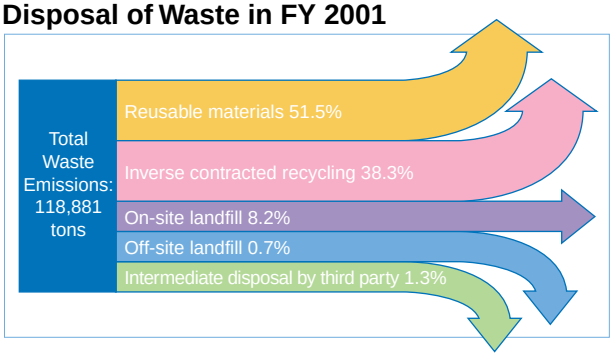
As a result of our efforts, we eliminated direct landfills at the Nagakusa Plant in FY 2000, and we achieved our target of "zero" direct landfills at our plants in Kariya, Kyowa, Takahama, and Hekinan in FY 2001, two years earlier than planned.

The Obu and Higashichita plants are also working to achieve the same target by FY 2003.

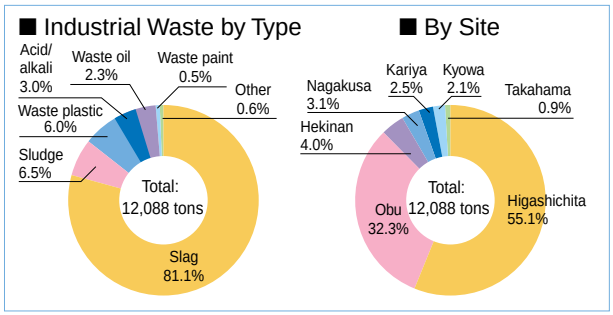
Industrial Waste Emissions



Disposal of Waste in FY 2001



Industrial Waste in FY 2001



*1 Recycling rate: Rate of industrial waste reused or recycled
*2 Zero emissions: Defined by Toyota Industries as a reduction in landfill waste of over 95% compared to FY 1998 levels
*3 Direct landfill waste: Industrial waste which is directly disposed of without intermediate treatment such as crushing or incineration

■Eliminating Indirect Landfill Waste*4

In November 2000, the Nagakusa Plant set up a zero emissions project with the goal of reducing indirect landfill to zero. The project team was the main actor in identifying key issues and promoting activities.

To promote zero emissions at this plant, plant employees inspected waste disposal areas and promoted active communication through the publishing of a newsletter on zero emissions, via the submission of reports to the division manager. As a result, each section worked to thoroughly separate its garbage and the plant achieved its target of zero indirect landfill by March 2002.

Zero Emissions Newsletter

Red Card

Establishing a Recycling Center (Nagakusa Plant)

The plant established a recycling center in March 2002. This was to support activities aimed at zero indirect landfill.

The center mainly handles the dismantling of parts which contain a mixture of metals and plastics and the separation of wastes collected during cleaning. This aided the promotion of recycling and improved the quality of recycling activities.

Reducing Municipal Waste and Proper Disposal

FY 2001 Results

We are reducing municipal waste such as paper, cardboard, and scrapped wood. On top of this, we carefully separate all the waste disposed of by our offices to ensure easy recycling. In FY 2001, total emissions from our sites were 1,120 tons. Of this total, the disposal of 185 tons was consigned out, while the remainder was reused or recycled.

Our recycling rate in FY 2001 was 83% for municipal waste.

Municipal Waste Reduction

■Using "Green" Office Supplies

At the Nagakusa Plant, the use of designated green office supplies is being promoted for many of the goods used at the plant. These products are made from recycled materials, are easy to dismantle, have long product lives, or are easy to recycle. The aim is to purchase those products which have the smallest impact on the environment.

Key Issues and Examples of Activities

	Details
Key Issues	Selection of facilities to carry out the recycling of waste following intermediate disposal
	Promotion of further understanding through the selection of workers to help attain zero emissions and parties responsible for waste disposal areas
	Inspection of waste disposal areas Meetings to report the improvements made in the workplace to the division manager
	Publication of Zero Emissions Newsletter (notification on how to separate garbage, introduction of activities that have been conducted, etc.)
Examples of Activities	Patrol of waste disposal areas Improvement awareness on the importance of separating garbage by issuing "yellow cards" and "red cards" to those not following rules
	Increasing visibility within the waste disposal area (transparent garbage pails for separating garbage)

Separating Garbage at the Recycling Center

In addition, as a part of environmental awareness activities, an in-house fair at the Nagakusa Plant was held to introduce these efforts to many of the company's other plants.

■Septic Tank Sludge Reduction at the Kyowa Plant

We have installed a septic tank suited to the number of our employees. Our wastewater gathered here is treated. During the normal maintenance of a septic tank, it is necessary to periodically drain the sludge out of the tank. This sludge is then treated as municipal waste.

To reduce sludge and alleviate the impact from this wastewater, the Kyowa Plant is using microorganisms in its three septic tanks on a trial basis. The unique characteristic of this treatment method is the organic compounds are decomposed into carbon dioxide and water by an enzyme produced by the microorganism.

As of March 2002, the plant no longer generates sludge. Owing to the exceptional results, the plant aims to continue its assessment of this method.

*4 Indirect landfill waste: Industrial waste which is used as landfill after crushing or incineration

Reducing Environmental Impact of Production Activities

Reducing Water Use

We are striving to reduce water consumption*1 from the standpoint of preserving water resources and minimizing the environmental impact of wastewater. In FY 2001, each of our plants surveyed its consumption of water resources to detect the production processes that use excess water.

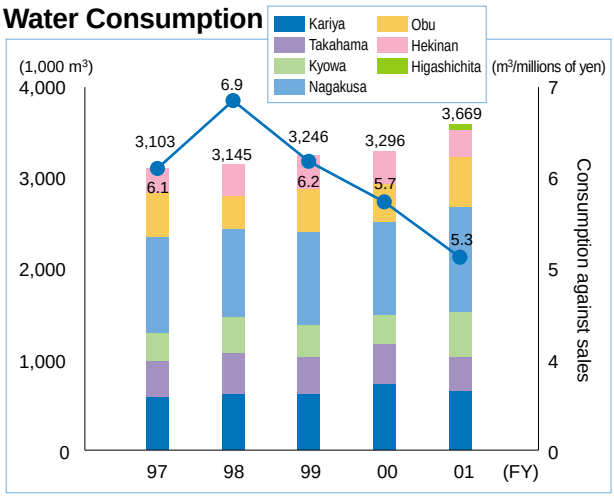
At the Compressor Division and the Nagakusa Plant, flow meters were installed at each of the process points where it was believed excess water was being consumed. We plan to install flow meters at the other plants as well, to measure excess water usage during certain processes of production. In this fashion, we are working to promote the reduction of water consumption.

During the construction of the Higashiura Plant, industrial water was unavailable. As an alternative, wastewater from the production process was recycled and a system to allow the utilization of rainwater was installed. This reduced water consumption and also supported the efficient use of this resource.

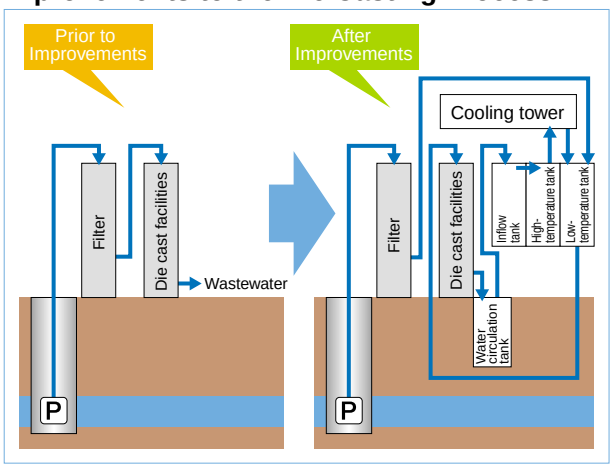
Wastewater emitted from the washing process during tin plating is being recycled. Our target is to recycle 40% of the water used during tin plating. We project this will allow us to conserve about 80,000 tons of water per year.

The rainwater utilization system consists of a tank which can store a maximum of 160 m³ of rainwater. The water stored in this tank is used for watering plants and in toilets. (For more details on our Higashiura Plant, see pages 36-37.)

Water Consumption



Improvements to the Die Casting Process



Improvements at the Obu Plant

■Reusing Water Used as Coolant in the Die Casting Process

During the die casting process, a product reaches temperatures of 200-300 ˚C just after being removed from the mold. It is then cooled in water. Conventionally the high-temperature water discharged was discarded.

In FY 2001, a storage reservoir for collecting the water and a cooling tower were installed. The wastewater is now being cooled and recycled for reuse. This is expected to save 35,000 m³ of water per year.

■Reducing Loss of Replenished Water Recovered from Die Casting

Water is used as a coolant during the die casting process. Once used, the wastewater is then circulated through the cooling tower and recycled for use.

Owing to the high temperature of the water used for cooling the die cast parts, water lost through evaporation must be replenished. However, the cooling tower was not capable of adapting to the change in water flow used during the production process; therefore, sometimes there was an overflow of water. This water was treated and released to nearby rivers.

To adjust to the fluctuation in water flow, a large reservoir was constructed in FY 2001. This is projected to result in a savings of 2,400 m³ of water per year.

*1 Water consumption: The amount of municipal, industrial and underground water used