TOYOTA

Environmental Report 2003

TOYOTA INDUSTRIES CORPORATION

Contents

The posts of directors stated in this report reflect changes as of the Board of Directors meeting held immediately following the Ordinary General Meeting of Shareholders on June 27, 2003, updating the data available on the issue date.

■ About the Cover of This Report

Toyota Industries is involved in a wide range of business activities in many different fields. The company's global annual production of environmentally conscious electric forklift and warehouse trucks amounts to approximately 90,000 units, including those of the BT Industries Group.

The front cover of the Environmental Report 2003 features the GENEO-E (7FBE outside Japan), a three-wheel electric counter-balanced forklift truck developed by TOYOTA Materials Handling Company and launched in January 2003 in Japan. The back cover features the BT REFLEX AC electric reach truck, which is manufactured and marketed by BT Industries.

The image of a butterfly playfully fluttering and perched on a lift truck, as if to rest on a flower, conveys the superior environmental performance of the forklift and warehouse trucks of the Toyota Industries Group.

Editorial Policy for the Environmental Report 2003

In accordance with revisions to the company's Third Environmental Action Plan that were instituted in August 2000, Toyota Industries is doing its utmost to ensure that its environmental conservation activities are reflected in every aspect of its daily business.

The Environmental Report 2003 details the company's objectives for its environmental conservation activities and the company's environmental achievements in FY 2002. In creating this report, Toyota Industries hopes to provide readers of the report with a better understanding of the company's environmental efforts as part of its continuing environmental dialogue.

Toyota Industries has created this document for a diverse audience including shareholders, customers, members of the local community, environmental experts and employees of both Toyota Industries and its subsidiaries. Every effort was made to ensure that the information contained in this report is accurately presented.

- In keeping with the previous report, each section covers one of the environmental activities included in the Third Environmental Action Plan.
- Starting from this year, the report includes environmental data for Toyota Industries' manufacturing-related subsidiaries. Examples of major environmental activities undertaken by the company's subsidiaries are also interspersed throughout the report.
- Environmental data for each plant is included at the end of the report in order to provide further detail on the company's impact on the environment. A conscious effort was made to reference numerical data wherever possible within the main text.

Report Structure and Layout

- Illustrations, charts and tables are used to aid readers in gaining an understanding of the company's activities.
- The company's major achievements in FY 2002 are highlighted throughout the report in the form of "Spotlight" sections focusing on various topics. The content of the report is structured in a manner that is as easily understandable for readers as possible.

Accuracy of Reporting

- The FY 2000 Environmental Reporting Guidelines published by Japan's Ministry of the Environment were used as a reference in creating this report.
- In keeping with the previous report, an external review was conducted by the ChuoAoyama PwC Sustainability Research Institute.

● Period and Scope of Environmental Report 2003

1. This report covers activities during the period from April 1, 2002 to March 31, 2003.*
   *More recent data are also occasionally included to describe certain major environmental activities.
2. This report covers environmental activities at Toyota Industries Corporation as well as its consolidated subsidiaries in Japan and overseas.

■ Subsidiaries Covered in This Report

		Manufacturing-Related		Other
Subsidiaries	In Japan	TIBC Corporation, Tokyu Co., Ltd., Nishina Industrial Co., Ltd., Tokaiseiki Co., Ltd., ST Liquid Crystal Display Corp.*	Altex Co., Ltd., Izumi Machine Mfg. Co., Ltd., SKE Inc., Iwama Loom Works, Ltd., Kawamoto System Corporation, Hara Corporation, Mizuho Industry Co., Ltd.	Advanced Logistics Solutions Co., Ltd., Taikoh Transportation Co., Ltd.
	Outside Japan	BT Industries Group, Michigan Automotive Compressor, Inc., Toyota Industrial Equipment Mfg., Inc., Toyota Industrial Equipment, S.A., TD Deutsche Klimakompressor GmbH, Kirloskar Toyoda Textile Machinery Ltd., ACTIS Manufacturing, Ltd. LLC	Toyota Industry (Kunshan) Co., Ltd.	
Environmental data		○	○	—
Examples of activities		○	—	○

*ST Liquid Crystal Display Corp. is accounted for as an affiliate by the equity method.
Note: For information about the scope of Toyota Industries' group-wide environmental management activities, see p.16.

● Correspondence with Japan's Environmental Reporting Guidelines (FY 2000 Version)

Subject	Topic	Page
1. Background information	(1) Preface on management responsibility	p.1
	(2) Relevant organizational structure, period, fields, contact information and other basic data	Inside front cover, back cover
	(3) Overview of business activities	p.2-3
2. Environmental conservation policy, objectives and performance	(1) Management policy and approach to environmental conservation	p.4
	(2) Environmental conservation objectives and action plan	p.8-9
	(3) Environmental accounting	p.13
3. Environmental management system	(1) Environmental management system	p.10-17
	(2) Environmental conservation-related technologies, Design for Environment (DfE) used in the development of products and services and other R&D initiatives	p.18-25
	(3) Environmental information disclosure and environmental dialogue	p.15, p.40-41
	(4) Regulatory compliance	p.14-15
	(5) Corporate citizenship activities	p.40-41
4. Measures to reduce environmental impact	(1) Assessment of overall environmental impact during life cycle of business activities	p.6-7
	(2) Measures to reduce input-related environmental impact (substances of concern, energy conservation)	p.6-7, p.26-33, p.37
	(3) Measures to reduce environmental impact upstream of corporate business activities (purchasing of products and services)	p.19
	(4) Measures to reduce environmental impact from waste (output) a) Emissions into air b) Emissions into water and soil c) Industrial waste emissions	 p.30-32, p.44-53 p.15, p.32, p.44-53 p.34-36, p.44-53
	(5) Measures to reduce environmental impact downstream of corporate business activities (provision of products and services)	p.22
	(6) Measures to reduce environmental impact from transportation activities	p.38-39
	(7) Measures to reduce environmental impact from environmental risks (chemical stockpiling, land utilization)	p.14-15

A Message from the President

Contributing to a Vibrant Future

When I consider the distant future that awaits humankind and then look back at the long march of history, I am reminded that the present is not simply a point in time, but part of a continuous and inexorable stream of events. This one continuous stream also includes the business activities of corporations.

Corporations have been in existence for only a fraction of humankind's long history, but they have made a major contribution to improving our living standards. However, the business activities of corporations have also resulted in various environmental problems which threaten the environment that supports human life on this planet. It is our responsibility to recognize this fact and to use this opportunity to work collectively for the greater good. We must combine our knowledge and wisdom to create an enriched global community where future generations can live in harmony with the planet.

Since early on, the Toyota Industries Group has reacted swiftly to the increasing demand for industrial machinery and advances in automation. We are proud to have developed products and systems that have contributed to enhancing the quality of daily life. At the same time, these products have had an undeniable impact on the environment. There are a range of issues to address, from the use of chemical substances to the emissions and waste produced by developing, manufacturing and using our products.

The company's acknowledgement of its environmental impact led Toyota Industries to form its own Environmental Committee in 1993. Since then, we have been strongly committed to carrying out activities that help to reduce the environmental impact of our business activities. During FY 2002—the second year of deployment of the Third Environmental Action Plan—we earnestly strove to achieve the targets.

These targets are based on the following major policies laid down in the Third Environmental Action Plan:

- Develop and provide clean products with minimal environmental impact
- Promote manufacturing that strives for zero emissions
- Expand the environmental management system
- Actively participate in public environmental conservation efforts as an upstanding corporate citizen

One of our achievements in FY 2002 was to foster the establishment of environmental management systems at our subsidiaries, thus expanding the scope of our environmental management system beyond Toyota Industries itself. Furthermore, in January 2003 we issued the Toyota Industries Group Corporate Commitment to the Environment, which has led to an even greater commitment to environmental efforts at all our subsidiaries worldwide.

We have now reached the halfway point for the Third Environmental Action Plan. Through FY 2005, when the Plan reaches its conclusion, we will continue to make environmental conservation and management one of our top priorities. Each and every employee of the Toyota Industries Group is striving to accomplish the five-year targets set forth in the Plan.

The Environmental Report 2003 presents the principal results of our activities carried out between April 1, 2002 and March 31, 2003. However, it is impossible to describe the full scope of our environmental activities within this report. Therefore, we invite readers to share their invaluable questions and opinions so that we may respond to them openly.

We at Toyota Industries are committed to working diligently to contribute to a bright future for all.

July 2003

Tadashi Ishikawa

Tadashi Ishikawa
President
Chairman, Environmental Committee
Toyota Industries Corporation

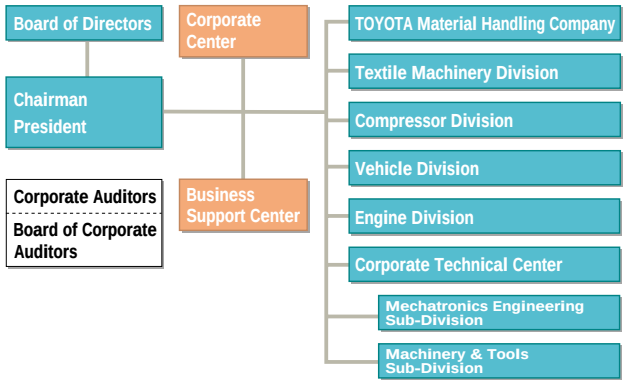
Corporate Information

● Corporate Data

Name	TOYOTA INDUSTRIES CORPORATION
Date of Establishment	November 18, 1926
Capital	¥68 billion (as of March 31, 2003)
Number of Employees*	25,030 (as of March 31, 2003)
Stock Exchange Listings	First sections of the Tokyo, Osaka, and Nagoya stock exchanges
Principal Businesses	Textile machinery, car air-conditioning compressors, materials handling equipment, vehicles, engines, and electronics

*On a consolidated basis

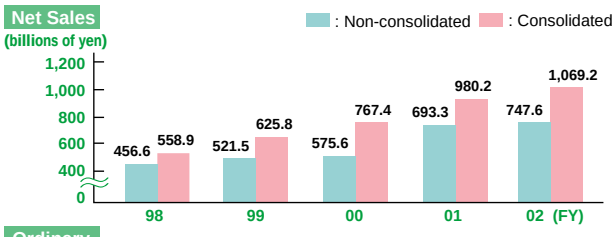
● Corporate Organization (As of March 31, 2003)

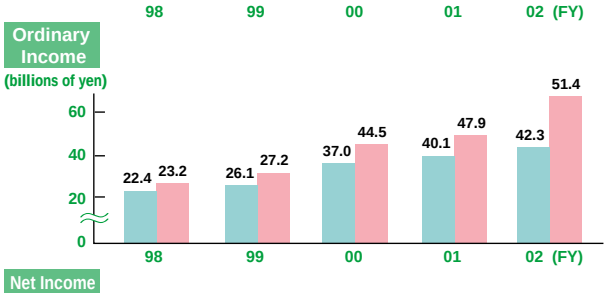


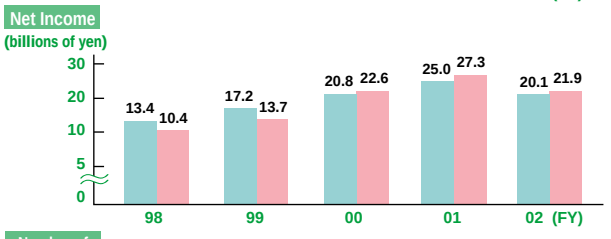
*In January 2002, the headquarters of Toyota Industries was reorganized into a Corporate Center (CO) and a Business Support Center (BS) to realize a division according to function and role.

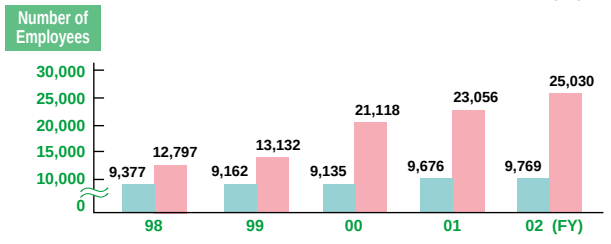
● Consolidated Net Sales, Ordinary Income, Net Income and Employees

*Net sales, ordinary income and net income figures are rounded to the nearest billion yen.









● Corporate History

1926 • Toyoda Automatic Loom Works, Ltd. (now Toyota Industries Corporation) established

1933 • Automobile Division set up

1935 • Company unveils Model G1 truck at a new-car-release exhibition in Shibaura, Tokyo

1937 • Automobile Division spun off as Toyota Motor Co., Ltd. (now Toyota Motor Corporation)

1940 • Steel Production Division spun off as Toyoda Steel Works, Ltd. (now Aichi Steel Corporation)

1944 • Obu Plant begins operations (manufacturing foundry parts)

1949 • Stock listed on Tokyo, Nagoya, and Osaka stock exchanges

1953 • Kyowa Plant begins operations (manufacturing engines and assembling automobiles)

1955 • Vehicle Division set up

1967 • Nagakusa Plant begins operations (manufacturing small commercial vehicles)

1970 • Takahama Plant begins operations (manufacturing material handling equipment)

1971 • Divisional structure introduced (Textile Machinery, Industrial Equipment, and Vehicle Divisions)

1977 • Compressor Division spun off from Textile Machinery Division

1982 • Hekinan Plant begins operations (automotive diesel engines)
• Total Quality Control (TQC) introduced

1985 • Engine Division spun off from Vehicle Division

1986 • Deming Prize received for quality control implementation

1988 • Toyota Industrial Equipment Mfg., Inc. (TIEM) established in Indiana, U.S., as a joint venture with Toyota Motor Corporation

1989 • Michigan Automotive Compressor, Inc. (MACI) established in Michigan, U.S., as a joint venture with Nippondenso Co., Ltd. (now DENSO Corporation)

1990 • 1990 PM Excellent Plant Award received

1994 • Toyota Industry (Kunshan) Co., Ltd. (TIK) established in Jiangsu, China, as a joint venture with Toyota Tsusho Corporation and Lioho Machine Works, Ltd.

1995 • Toyota Industrial Equipment, S.A. (TIESA) established in France as a joint venture with Toyota Motor Corporation and Manitou B.F.
• Kirloskar Toyoda Textile Machinery Ltd. (KTTM) established in India as a joint venture with the Kirloskar Group

1997 • ST Liquid Crystal Display Corp. (ST-LCD) jointly established with Sony Corporation for the production of LCDs

1998 • TD Deutsche Klimakompressor GmbH (TDDK) jointly established in Germany with DENSO Corporation for the production of car air-conditioning compressors
• TIBC Corporation jointly established with Ibiden Co., Ltd. for the production of plastic package substrates for IC chipsets

1999 • Company takes over water-jet loom business from Nissan Texsys Co., Ltd.

2000 • Company acquires BT Industries AB of Sweden, a world-leading manufacturer of warehouse trucks used in the production process

2001 • Company takes over the Industrial Equipment Sales Division of Toyota Motor Corporation, establishing TOYOTA Material Handling Company as an in-house company
• Name changed to Toyota Industries Corporation
• ACTIS Manufacturing, Ltd. LLC established in Texas, U.S., as a joint venture with DENSO Corporation and Toyota Tsusho Corporation for remanufacturing of automotive compressors
• Higashichita Plant begins operations (manufacturing foundry parts)

2002 • Company reorganizes headquarters into Corporate Center (CO) and Business Support Center (BS)
• Higashiura Plant begins operations (manufacturing car air-conditioning compressor components)
• Advanced Logistics Solutions Co., Ltd. established to conduct logistics planning and manage distribution center operations.

● Production Facilities (Employee numbers are as of March 31, 2003)

Kariya Plant

Textile Machinery Division
Compressor Division

Address: 2-1, Toyoda-cho, Kariya, Aichi
Main products: Textile machinery, car air-conditioning compressors
Employees: 1,720

Takahama Plant

TOYOTA Material Handling Company

Address: 2-1-1, Toyoda-cho, Takahama, Aichi
Main products: Forklift trucks, materials handling systems
Employees: 1,440

Kyowa Plant

Corporate Technical Center
Machinery & Tools Sub-Division
Mechatronics Engineering Sub-Division

Address: 8, Chaya, Kyowacho, Obu, Aichi
Main products: Electronic equipment, manufacturing equipment, press dies
Employees: 918

Nagakusa Plant

Vehicle Division

Address: 9-2, Yamaguchi, Nagakusa-cho, Obu, Aichi
Main products: Automobiles
Employees: 2,140

Obu Plant

Compressor Division

Address: 1-1, Ebata-cho, Obu, Aichi
Main products: Parts for car air-conditioning compressors
Employees: 383

Hekinan Plant

Engine Division

Address: 3, Hama-cho, Hekinan, Aichi
Main products: Engines (for use in automobiles and material handling equipment)
Employees: 1,369

Higashichita Plant

Engine Division

Address: 4-15, Nittou-cho, Handa, Aichi
Main products: Foundry parts
Employees: 380

Higashiura Plant

Compressor Division

Address: 1-1, Shimomeotosaka, Ogawa, Higashiura-cho, Chita-gun, Aichi
Main products: Parts for car air-conditioning compressors
Employees: 64

● Major Subsidiaries and Affiliates (As of March 31, 2003)

In Japan	
TIBC Corporation (TIBC)	TOYOTA L&F Tokyo Co., Ltd.
Logistics Planning Tokyo Co., Ltd.	Altex Co., Ltd.
Sun River Co., Ltd.	Izumi Machine Mfg. Co., Ltd.
TOYOTA L&F Keiji Co., Ltd.	Tokyu Co., Ltd.
Mino Tokyu Co., Ltd.	Advanced Logistics Solutions Co., Ltd. (ALSO)
Teion Syokuhin Ryutsu Inc.	Toyoda High System, Incorporated
Nishina Industrial Co., Ltd.	Suzaka Nishina Industrial Co., Ltd.
Tokaiseiki Co., Ltd.	Logistec Co., Ltd.
Taikoh Transportation Group (5 companies)	SKE Inc.
SK Maintenance Inc.	Iwama Loom Works, Ltd.
Kawamoto System Corporation	Arti Inc.
TOYOTA L&F Shizuoka Co., Ltd.	Hara Corporation
Mizuho Industry Co., Ltd.	Sun Valley Inc.
Sun Staff, Inc.	Tokai System Institute Corp.
Shine's Inc.	ST Liquid Crystal Display Corp. (ST-LCD)
Aichi Corporation	

Outside Japan	
Toyoda International Sweden AB (TIS)*	BT Industries Group
Michigan Automotive Compressor, Inc. (MACI)	Kirloskar Toyoda Textile Machinery Ltd. (KTTM)
Toyota Industries North America, Inc. (TINA)	Toyota Industrial Equipment Mfg., Inc. (TIEM)
Toyota Material Handling USA, Inc. (TMHU)	ACTIS Manufacturing, Ltd. LLC (ACTIS)
Toyota-Lift of Los Angeles, Inc. (TLA)	Toyoda Textile Machinery, Inc. (TTM)
Toyota Industries Personnel Service of America, Inc. (TIPA)	TD Deutsche Klimakompressor GmbH (TDDK)
Toyota Industry (Kunshan) Co., Ltd. (TIK)	Toyota Truck Norge AS (TTN)
Toyota Industrial Equipment, S.A. (TIESA)	Toyota Gabelstapler Deutschland GmbH (TGD)
Toyota Industrial Equipment (UK) Limited (TIEUK)	Toyota Industrial Equipment Europe S.A.R.L. (TIEE)

*Toyoda International Sweden AB changed its name to Toyota Industries Sweden AB in May 2003.

Highlights of FY 2002 Environmental Activities

Environmental Management

Published the Toyota Industries Group Corporate Commitment to the Environment —First Year of Group-Wide Environmental Management

Toyota Industries published the Toyota Industries Group Corporate Commitment to the Environment on January 1, 2003. The Commitment is based on the principles of "Responsibility, Enhancement and Harmony" and recognizes the overall environmental impact of the Toyota Industries Group, which encompasses Toyota Industries and its subsidiaries. The Commitment describes Toyota Industries' desire to make a stronger commitment to carrying out environmental activities in order to fulfill its corporate responsibilities.

By sharing a group-wide commitment to the environment, the Toyota Industries Group has taken its first major steps toward establishing an environmental management system that includes both Toyota Industries and its subsidiaries. The Toyota Industries Group is dedicated to promoting environmental management and contributing to the creation of a sustainable society.

Corporate Philosophy

Respect for the Law	Toyota Industries is determined to comply with the letter and spirit of the law, in Japan and overseas, and to be fair and transparent in all its dealings.
Respect for Others	Toyota Industries is respectful of the people, culture, and traditions of each region and country in which it operates. It also works to promote economic growth and prosperity in those countries.
Respect for the Natural Environment	Toyota Industries believes that economic growth and conservation of the natural environment are compatible. It strives to offer products and services that are clean, safe, and high quality.
Respect for Customers	Toyota Industries conducts intensive product research and forward-looking development activities to create new value for its customers.
Respect for Employees	Toyota Industries nurtures the inventiveness and other abilities of its employees. It seeks to create a climate of cooperation, so that both employees and the Company can realize their full potential.

Toyota Industries Group Corporate Commitment to the Environment

The Toyota Industries Group conducts its daily business operations to promote global economic development and better quality of life through our products and services.

Throughout all our business activities, we always consider environmental issues in the life cycle of our products.

We will address the concept of "sustainable management" as one of our most important challenges. The entire Toyota Industries Group will strive toward the harmonious coexistence of economic development and the environmental conservation.

●GLOBAL VISION

Responsibility	Fulfill our social responsibility of environmental conservation
Enhancement	Enhance eco-efficiency for all of our business activities, products, and services.
Harmony	Collaborate with local communities and global society in addressing environmental conservation

●CORPORATE COMMITMENT

1. The Toyota Industries Group will strive for further reduction of environmental impact, as well as compliance with laws and regulations.
2. The Toyota Industries Group will develop and provide products and services with top-level environmental performance.
3. The Toyota Industries Group will conduct production activities taking into account prevention of global warming, effective application of energy and resources, and reduction of substances of environmental concern.
4. The Toyota Industries Group will communicate closely with a wide range of people, including our customers and shareholders, and continually improve our system of "sustainable management."
5. The Toyota Industries Group will actively address various environmental issues in local communities and global society as an upstanding corporate citizen.

January 1, 2003

Tadashi Ishikawa
President
Chairman of the Environmental Committee
Toyota Industries Corporation

Group-wide management is described in more detail on p.16–17.

Subsidiary Spotlight This symbol is used throughout this report to indicate activities implemented by subsidiaries of Toyota Industries.

Environmentally Conscious Products

Development of Electrically Driven CO_2 Compressor Used in Car Air Conditioners

Toyota Industries, working jointly with DENSO Corporation, recently developed the electrically driven CO_2 compressor for car air conditioners. The new CO_2 compressor represents an important step toward the prevention of global warming. In December 2002, the Japanese government took delivery of four revolutionary fuel-cell hybrid vehicles developed by Toyota Motor Corporation that were equipped with the new CO_2 compressors.

See p.25

Electrically Driven CO_2 Compressor

Environmentally Conscious Products

GENEO-E (7FBE) Environmentally Conscious Three-Wheel Electric Forklift Truck

The new GENEO-E forklift truck (7FBE outside Japan) is a part of Toyota Industries' best-selling GENEO series (7-series outside Japan) of forklift trucks and is designed to meet the growing demand for environmentally conscious features among forklift truck users. The GENEO-E forklift truck was released in January 2003 in the Japanese market and features the new System of Active Stability and an AC (alternating current) power system.

See p.23

GENEO-E (7FBE outside Japan)
Three-Wheel Electric Counterbalanced Forklift Truck

Energy Conservation

Toyota Industries' Fifth Cogeneration System

Annual CO_2 emissions reduction: 10.5 kt-CO_2

Toyota Industries' Kyowa Plant manufactures electronic equipment, manufacturing equipment, and press dies. The company's fifth cogeneration system is located at this plant, which relies on a clean energy source, city gas, for conversion to electrical and steam power. The cogeneration system at the Kyowa Plant is expected to reduce CO_2 emissions by 10.5 kt-CO_2 annually.

See p.27

Chemical Substance Management and Activities to Reduce Substances of Concern

Switching to Powder Coating for Forklift Truck Painting Processes

Annual VOC emissions reduction: 70 tons

Toyota Industries' Takahama plant manufactures forklift trucks. This involves painting processes that have been identified as a source of VOC emissions. In January 2003, the Takahama Plant stopped using solvent-based coatings for forklift truck mast painting processes in favor of a powder coat process that is environmentally conscious, as well as safer for the company's workers.

See p.31

Reducing Industrial Waste

Promoting of Resources Reuse and Recycling

Kariya Plant and Kyowa Plant Achieve Zero Emissions Target for Indirect Landfill Industrial Waste

Kariya Plant

Kyowa Plant

Toyota Industries is dedicated to activities that contribute to creating a sustainable society. The company has achieved its goal of zero emissions of in-direct landfill industrial waste at its Kariya Plant and Kyowa Plant.

See p.34-35

Working with the Community

Toyota Industries Receives the Excellent Sustainable Management Award at the 1st Japan Sustainable Management Awards

Toyota Industries' Kariya Plant, which manufactures car air-conditioning compressors and textile machinery, was recently awarded the Excellent Sustainable Management Award at the 1st Japan Sustainable Management Awards.

See p.41

Business Activities and Environmental Impact

Toyota Industries' Business Activities and the Environment

Toyota Industries manufactures textile machinery, car air-conditioning compressors, forklift trucks, automobiles, engines and electronic equipment. Its business activities have an impact on the environment during manufacturing and during the subsequent use of its products. Toyota Industries seeks to accurately gauge each aspect of its environmental impact and implement appropriate countermeasures to reduce the environmental impact.

Development and Design

Environmental Aspects

- Use of personal computers, etc.

Environmental Impact

- Resource depletion
- Global warming

Production

Process	Environmental Impact	Production Process Activity
All processes	Global warming	Increase productivity and conserve energy
Casting	Waste generation	Reduce waste and promote waste reuse
	Air pollution, foul odors	Replace substances of concern with alternatives
Machining, cleaning	Water pollution	Promote stricter wastewater management
	Waste generation	Reduce waste and promote waste reuse
Plating	Water pollution	Promote stricter wastewater management
Painting	Air pollution caused by VOCs	Switch to powder coating and water-based coatings
	Foul odors	Install pollutant removal devices
	Water pollution	Promote stricter wastewater management

Development and Design Activity

Environmental Impact of Products

Toyota Industries is committed to developing and providing products that are designed to be environmentally conscious.

Toyota Industries is involved in a wide range of business activities and its products are used throughout the world in many different types of applications. Toyota Industries recognizes the environmental impact of its products and is taking effective steps to reduce their impact on the environment. By establishing specific goals during the development and design stage of each product, Toyota Industries is able to develop and provide environmentally conscious products.

Reuse
Recycling

Environmental Impact from Manufacturing

Toyota Industries acknowledges that its production activities have a major impact on the environment and is carrying out comprehensive activities to reduce their environmental impact.

Electric power consumption during manufacturing leads to global warming and causes a direct impact on the surrounding environment. Casting, painting and other manufacturing processes employed by Toyota Industries also have a significant impact on the environment. Therefore, Toyota Industries has established aggressive goals designed to reduce the environmental impact of these and other manufacturing processes.

Disposal

Environmental Aspects

- Separation of recyclable waste
- Waste treatment and disposal

Environmental Impact

- Resource depletion • Water pollution • Foul odors
- Air pollution • Global warming • Noise and vibration
- Hazardous chemical pollution

Development and Design Activities

- Improve recyclability
- Reduce use of substances of concern

*Clean-energy vehicles: Electric forklift trucks and compressed natural gas (CNG)-powered forklift trucks.

Water	Paper	Energy		Chemical Substances	
3,901 km^3	136 tons	Electricity	386,966 MWh	PRTR-designated substances	2,517 tons
		City gas	56,225 km^3	Toxic substances	4,537 tons
		LPG	113 tons		
		Petroleum	2,770 kl		
		Coke	8,297 tons		

INPUT

	Textile Machinery	Compressors	Forklift Trucks	Automobiles	Engines		Electronic Components
							
	Plants						
	Kariya	Kariya, Obu, Higashiura	Takahama	Nagakusa	Hekinan	Higashi-chita	Kyowa
	○	○	○	○	○	○	○
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	•Improve energy efficiency •Reduce use of substances of concern	•Reduce weight •Improve power efficiency •Reduce use of substances of concern	•Develop clean-energy vehicles* •Achieve cleaner exhaust gas emissions •Reduce use of substances of concern •Improve recyclability	•Design for reduced weight •Reduce use of substances of concern •Improve recyclability	•Improve fuel efficiency and combustion efficiency •Reduce noise and vibration •Reduce use of substances of concern		•Reduce use of substances of concern

Air		Water		Industrial waste	
CO_2	308 kt-CO_2	COD	17 tons	Recycled by third party	39,808 tons
SOx	854 m^{3}N	Nitrogen	14 tons	Intermediate processing by third party	597 tons
NOx	34,854 m^{3}N	Phosphorus	0.1 tons	Direct landfill	6,175 tons
VOC	1,591 tons	PRTR-designated substances	0.5 tons	Recycling rate	85%
PRTR-designated substances	623 tons				

OUTPUT

Use

Environmental Aspects
•Use of products

Environmental Impact
•Resource depletion •Air pollution •Global warming •Noise and vibration

Development and Design Activities
•Improve fuel efficiency •Exhaust gas reduction •Reduce noise and vibration

Distribution

Environmental Aspects
•Operation of trucks and other forms of transport

Environmental Impact
•Resource depletion •Air pollution •Global warming •Noise and vibration

Activities
•Logistics streamlining

OUTPUT

Total CO_2 emissions
6.9 kt-CO_2

Environmental Action Plan and FY 2002 Results

■ Corporate Philosophy, the Toyota Industries Group Corporate Commitment to the Environment, and the Third Environmental Action Plan

Corporate Philosophy
(see p.4)

Toyota Industries Group Corporate Commitment
(see p.4)

Third Environmental Action Plan

●Basic Policies

1. Conduct corporate activities that are considerate of the environment at every stage of the product's life cycle from development through design, production, use, and disposal, to provide society with clean and safe products.
2. Strive to intensify environmental management, including that of consolidated subsidiaries, for the further advancement of corporate activities that support environmental conservation.
3. Promote social contribution efforts, information disclosure, and awareness through wide-ranging cooperation with society on environmental conservation with the ultimate aim of achieving a better global environment.

●Action Guidelines

1. Develop and provide clean products with minimal environmental impact.
2. Promote manufacturing that strives for zero emissions.
3. Expand the environmental management system.
4. Actively participate in public environmental conservation efforts as an upstanding corporate citizen.

■ Action Policies, FY 2002 Targets and Results for the Third Environmental Action Plan (non-consolidated)

◆Product Development and Products
[Action Guideline: Develop and provide clean products with minimal environmental impact]

Assessment scores indicate the level of achievement against the FY 2002 targets.
○: Target achieved △: 90% or better rate of achievement ×: Less than 90% rate of achievement

Targets	Action Policies	FY 2002 Targets	Results	Assessment	Reference
Improve fuel efficiency	•Achieve best-in-class fuel efficiency in all countries and regions and reduce CO_2 emissions •Improve fuel efficiency and reduce CO_2 emissions through the development of energy conservation technologies	Develop energy-saving weaving machinery	Developed energy-saving weaving machinery (JAT710 Air Jet Loom)	○	p.24
Reduce exhaust gases	•Tailor measures in accordance with usage environments	Make diesel engine exhaust gases cleaner	Developed 2Z engine in compliance with 2003 exhaust gas regulations for special-use vehicles in Japan	○	p.23
Develop clean-energy vehicles	•Launch new vehicles in accordance with market conditions •Develop clean products that meet market needs	Improve performance of electric forklift trucks	•Increased use of AC motors in forklift truck models •Expanded lineup of forklift trucks running on compressed natural gas (CNG)	○	p.23
Improve recyclability	•Promote recyclable designs contributing to the target of a 95% recycling rate by 2015 •Increase the use of recycled materials	Revise Toyota Recyclable Design Guidelines	Revised guidelines to comply with ISO standards	○	p.22
Control and reduce substances of concern	•Develop a world-class system for global management of chemical substances	Conduct survey on compliance with EU end-of-life vehicle directive	Reported survey results to two companies (Toyota Motor Corporation and other)	○	p.19
		Revise Guidelines on Reducing Substances of Concern	Revised guidelines	○	
Reduce noise	•Further reduce noise from all sources in automobiles and forklift trucks	Switch to alternating current (AC) motors in electric forklift trucks	Increased use of AC motors in forklift truck models	○	p.23
Prevent global warming due to car air conditioners	•Develop compressors that are compatible with new alternative refrigerants to HFCs	Develop compressors that use alternative refrigerants	Developed electric compressor that uses CO_2 refrigerant	○	p.25
Strengthen environmental assessment at the development and design stages	•Conduct prior assessments of all the environmental impact throughout the product life cycle from the very first stage of development and design	Implement Life Cycle Assessment (LCA) for one category of products/parts	Implemented LCA for hydraulic fittings	○	p.20-21
Strengthen cooperation with business partners	•Promote green procurement*1 through strengthened cooperation with business partners	Revise Green Procurement Guidelines	Issued 2nd edition of Green Procurement Guidelines	○	p.19
		Sponsor briefing session on green procurement	Sponsored and held briefing session on green procurement	○	

◆Manufacturing and Logistics [Action Guideline: Promote manufacturing that strives for zero emissions]

Targets	Action Policies	FY 2002 Targets	Results	Assessment	Reference
Set global warming preventive measures	•Actively promote CO_2 reduction measures Reduce total emissions by 5% compared with FY 1990 levels by March 2006 (10% by FY 2010) •Promote thorough energy conservation programs •Develop technology to reduce CO_2 emissions during manufacturing	Total CO_2 emissions: 254.1 kt-CO_2	Total CO_2 emissions: 269.1 kt-CO_2	△	p.26-29
		Emissions per net sales CO_2 emissions: 386 t-CO_2/billion yen	Emissions per net sales: 360 t-CO_2/billion yen	○	
		Reduction in CO_2 emissions (from FY 2001): 15.9 kt-CO_2	Reduction in CO_2 emissions: 18.6 kt-CO_2	○	

*1 Green procurement: Procurement of parts and raw materials from ISO 14001 certified suppliers, or which contain reduced levels of substances of concern.
*2 PRTR: Pollutant Release and Transfer Register
*3 VOC: Volatile Organic Compounds
*4 Zero emissions of landfill waste: Defined by Toyota Industries as a 95% or greater reduction in direct landfill waste compared with FY 1998 levels, and a 95% or greater reduction in indirect landfill waste compared to 1999 levels.

Third Environmental Action Plan

The Environmental Action Plan expands on the basic corporate philosophy of Toyota Industries, which states, "Toyota Industries believes that economic growth and conservation of the natural environment are compatible. It strives to offer products and services that are clean, safe, and high quality." The Plan sets forth major policies and guidelines for environmental activities, so that Toyota Industries may promote the environmental action plan throughout the company.

Toyota Industries established its Third Environmental Action Plan in 2000, covering a five-year period ending in FY 2005. The second year of the plan includes specific targets to be attained during FY 2002, which address specific issues covering all aspects of the company. These company-wide efforts are implemented under the direction of the specialized subcommittees that work under the Environmental Committee (see p.10).

◆**Manufacturing and Logistics** [Action Guideline: Promote manufacturing that strives for zero emissions]

Targets	Action Policies	FY 2002 Targets	Results	Assessment	Reference
Strictly control and reduce the use of substances of concern	• Heighten proper control and voluntary reduction of chemical substances used in production processes PRTR*2: Reduce total emissions of targeted substances by 50% compared with FY 1998 levels by March 2006 VOCs*3: Promote total emissions reduction and reduce emissions from painting lines by 50% compared with FY1998 levels by March 2006	Total emission of PRTR-designated substances: 589 tons	Total emissions: 633 tons	△	p.30-32
		VOC emissions per net sales: 3.7 tons/billion yen	Emissions per net sales: 3.3 tons/billion yen	○	
Reduce waste and conserve resources	• Reduce waste for achievement of zero emissions Zero emissions: Eliminate direct landfill disposal at all plants by March 2004 • Promote paperless operations by enhancing in-house IT network systems	Direct landfill industrial waste volume: 7,000 tons	Volume: 6,175 tons	○	p.34-36
		Indirect landfill industrial waste volume: 1,154 tons	Volume: 474 tons of landfill waste*4 Zero emissions achieved at Kariya Plant and Kyowa Plant	○	
Curtail water use	• Various activities	Water consumption: 3,258 km^3	2,930 km^3	○	p.37
		Consumption per vehicle: 5.5m^3/vehicle	4.3m^3/vehicle	○	
Conduct logistics streamlining measures	• Improve transport efficiency and promote CO_2 reduction and resource conservation through the reduction of packing materials	CO_2 emissions from logistics operations: 7.4 kt-CO_2	Emissions: 6.7 kt-CO_2	○	p.38-39
		Packing material consumption: 3,714 tons	Consumption: 4,341 tons	×	

◆**Environmental Management** [Action Guideline: Expand environmental management system]

Targets	Action Policies	FY 2002 Targets	Results	Assessment	Reference
Expand environmental management system	• Develop basic policies and organize administration system for group companies • Acquire ISO 14001 certification at group companies	Establish framework for group-wide environmental management system	Established 3-year plan for group-wide environmental management system	○	p.16-17
		Establish guidelines for Environmental Indicators	Established guidelines	○	
		Assist in acquisition of ISO 14001 certification	Acquired ISO 14001 certification at Taikoh Transportation Co., Ltd., Izumi Machine Mfg. Co., Ltd. and SKE Inc.	○	
Enhance environmental accounting system	• Develop environmental accounting system	Revise standards for environmental accounting	Implemented revisions	○	p.13

◆**Corporate Citizenship** [Action Guideline: Actively participate in public environmental conservation]

Targets	Action Policies	FY 2002 Targets	Results	Assessment	Reference
Make efforts to create a recycling-oriented society	• Participate in efforts in the public sphere aimed at the achievement of a 95% recycling rate by 2015	—	—	—	—
Promote community involvement	• Broaden dialogue with local communities and intensify commitment to 'greenery activities'	Offer support based on the theme of the global environment (5 cases)	Provided support to the Japan Eagle and Hawk Research Center and Keidanren Nature Conservation Fund (5 events)	○	p.12, p.40-41
		Employee volunteer activities (10 cases)	Clean-up activities, support of iris cluster environmental preservation activities (10 events)	○	
Promote public relations and disclosure activities	• Expand environmental communications	Publish an environmental report	Published the Environmental Report 2002 (July 2002)	○	
		Improve internal communications	17 articles on the environment in the company magazine	○	

*Starting in FY 2002, the target for VOC emissions was changed from a total emissions volume basis to an emissions per net sales basis.

For further information about the Environmental Action Plan and results for FY 2001, please visit us on the Web at
www.toyota-industries.com/environment

Consolidation and Promotion of Environmental Management System

Toyota Industries is dedicated to promoting a wide range of environmental initiatives.

Toyota Industries' environmental activities began in 1993, when it established an Environmental Committee and published the company's First Environmental Action Plan. Since then, Toyota Industries has been involved in various environmental activities with a strong emphasis on minimizing the release of substances of concern during its production processes. These efforts have led to the introduction of an environmental management system that is applied to the company's manufacturing activities. In 1997, the automobile-producing Nagakusa Plant became the first Toyota Industries plant to acquire ISO 14001 certification. Now, all the company's plants in Japan have ISO 14001 certification.

While continuing to implement environmental measures in its manufacturing activities, Toyota Industries also began to focus on the environmental impact of its products. In FY 2001, Toyota Industries set out to create an environmental management system for product development.

In order to ensure that environmentally conscious activities are carried out in all of its business activities, Toyota Industries is focused on educating each of its employees so that they have a better understanding of how their daily activities affect the environment.

Organization

Toyota Industries' environmental management organization is led by the President and ensures the active involvement of every part of the company.

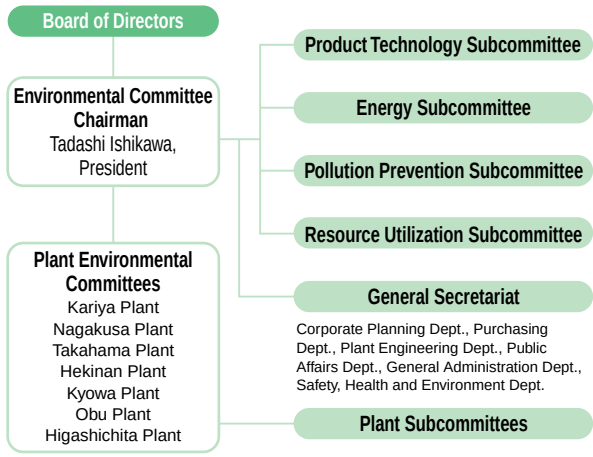
The company's strategy is to introduce environmental management systems for its manufacturing and product development, which serve as the basis for implementing environmental activities.

Toyota Industries' Environmental Committee was established in 1993 and serves as the core organization for promoting environmental activities within the company. The Committee is chaired by the President and is responsible for setting the direction of major policies including corporate environmental policies and environmental action plans. In addition, the Committee monitors the progress of key environmental activities within the company.

There are four specialized subcommittees that work under the Environmental Committee, consisting of the Product Technology Subcommittee, the Energy Subcommittee, the Pollution Prevention Subcommittee, and the Resource Utilization Subcommittee. These subcommittees are responsible for promoting key environmental activities for each of the company's business endeavors.

The policies and decisions made by the Environmental Committee and the specialized subcommittees are handed down to the Plant Environmental Committee at each plant. The Plant Environmental Committees are chaired by the Environmental Conservation Director at each plant and are in turn served by Plant Subcommittees. These plant-level committees strive to ensure that the company's environmental activities secure the full participation of each and every plant employee.

Organizational Framework for Environmental Management



Organizational Roles

Organization	Chairman	Functions and Activities
Environmental Committee	Tadashi Ishikawa, President	1. Decide the direction of key corporate activities for environmental conservation 2. Promote environmental activities on a company-wide basis
Product Technology Subcommittee	Masazumi Konishi, Senior Managing Director	1. Develop environmentally conscious products 2. Promote recyclable designs 3. Promote life cycle assessments (LCAs) for products 4. Establish an environmental data system 5. Consolidate company-wide regulations
Energy Subcommittee	Iwao Katayama, Managing Director	1. Promote energy efficiency 2. Promote energy conservation activities
Pollution Prevention Subcommittee	Shiro Endo, Senior Managing Director	1. Promote pollution prevention activities 2. Conduct comprehensive management of chemical substances
Resource Utilization Subcommittee	Shinjiro Kamimura, Senior Managing Director	1. Promote reduction and reutilization of waste 2. Promote more efficient use of resources 3. Promote conservation of water resources and packing materials, and lower CO_2 emissions from transport

Improving the Environmental Management System

Toyota Industries is constantly working to improve its environmental management system through rigorous monitoring and evaluation procedures.

● ISO 14001 Certification

With the acquisition of ISO 14001 certification by Toyota Industries' Higashichita Plant and Higashiura Plant in FY 2002, all of the company's plants are now ISO-certified.

The company has also expanded its ISO 14001 certification to encompass its product development sectors in addition to its manufacturing sectors. In FY 2002, the Nagakusa Plant and the Kyowa Plant expanded their ISO 14001 certification to include the product development sectors at their plants.

Furthermore, the TOYOTA Material Handling Company expanded its ISO 14001 certification to include its Higashisakura office, the location of one of the company's sales and services organizations.

ISO 14001 Certification

Plant	Acquisition Date*1	Product Development	Management and Services
Kariya	October 1998	○	○*2
Takahama	December 1998	○	○*3
Kyowa	January 2000	○	—
Nagakusa	October 1997	○	—
Obu	March 2000	—	—
Hekinan	November 1999	○	—
Higashichita	March 2003	—	—
Higashiura*4	March 2003	—	—

*1 Certification of manufacturing sectors
*2 Corporate Center/Business Support Center (CO/BS)
*3 Certification of services sector at Higashisakura Office
*4 Certification expanded to other sectors during update audit by Obu Plant

● External Environmental Audits

In FY 2002, an external audit was conducted of Toyota Industries' environmental management system. The external audit noted two minor nonconformities and 38 observational notes. The specific areas for improvement identified by the external audit were as follows: the extent of management and service division capacity to identify environmental concerns, the capacity to implement corrective action, and the need for greater efficiency in the company's internal audits. The company is now taking concrete measures to address these shortcomings and to continue to promote its environmental management system.

Environmental Audit Results

ISO 14001 Requirements	Shortcomings Noted		Observations and Minor Noncomformities
	Minor Nonconformities	Observational Notes	
Environmental policy	—	2	Company-wide awareness of environmental policy
Planning	—	10	Indirect environmental impact assessments and identification methods of laws and regulations
Implementation and operation	1	13	Criteria of emergency preparedness and response, external communication methods
Checking and corrective action	1	11	Corrective actions and implementation of internal audits
Management review	—	2	Process of management reviews

● Internal Environmental Audits

Toyota Industries recognizes that internal audits are the most critical factor in improving the company's environmental management systems. The company conducts self-check audits at each plant, which are augmented by company-wide audits implemented by the Corporate Center/Business Support Center (CO/BS). Each type of audit contributes to the continuity and improvement of environmental management systems within the company.

Toyota Industries also places great emphasis on training qualified auditors as a means of improving the quality of its internal audits. Employees must receive in-house training and pass an auditors' test before they are eligible to become internal environmental auditors. As of March 2003, a total of 666 employees had become qualified internal auditors.

In the future, Toyota Industries will strive to address the shortcomings that were identified by the recent external audit. The company will accomplish this by reviewing its auditing system in order to improve the efficiency of its internal audits.

● Indirect Environmental Impact Assessments

Until now, Toyota Industries has focused its efforts on reducing the company's direct environmental impact through activities such as energy conservation during manufacturing and the reduction of substances of concern and industrial waste. However, Toyota Industries now faces the challenge of expanding its environmental activities to its management operations and services and widening its focus to address the company's indirect environmental impact. Toyota Industries views indirect environmental impact assessments as an important aspect of its environmental management efforts.

Toyota Industries has taken a major step in this direction by creating an indirect environment assessment system that helps to identify the company's indirect environmental impact in its various business activities. In FY 2002, the system was adopted by all Toyota Industries' plants. The company has also implemented various efforts such as holding seminars featuring guest speakers from outside the company, as a means of raising awareness within the company.

Company Seminar on Indirect Environmental Impact Assessments

Environmental Education and Awareness

Toyota Industries is focused on increasing its employees' environmental awareness through employee training, company-sponsored seminars and the company magazine.

Toyota Industries believes that greater environmental awareness among its employees is a critical component of environmental management. The company's educational efforts are also designed to encourage the adoption of environmental practices among its employees.

● Environmental Education

Toyota Industries conducts three types of environmental education for its employees, consisting of general education implemented at the plant level, company-wide environmental education based on employee position, and specialized training implemented throughout the company.

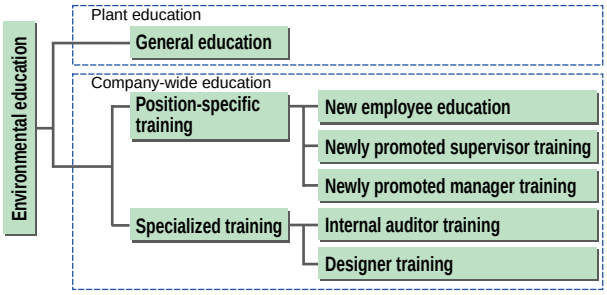
General education at the plant level is conducted on a departmental basis. The goal of this education is to provide employees with a thorough understanding of the environmental impact of the department's activities and the goal of environmental efforts. Plant employees are also educated regarding the corporate environmental action plan.

Company-wide environmental education consists of new employee training and also training for newly promoted supervisors and managers. These programs are designed to provide each group of employees with the environmental knowledge required for their respective positions within the company. Specialized training includes, for example, training for internal auditors. This latter form of training is designed to nurture future leaders to become guides for environmental activities. In FY 2002, Toyota Industries introduced training in environmental design for its designers.

FY 2002 Education

Program	Attendees
New employee education	340
Newly promoted supervisor training	465
Newly promoted manager training	117
Internal auditor training	152
Designer training	88

Framework for Environmental Education



● Environmental Management Seminars

In FY 2002, Toyota Industries sponsored three seminars on environmental management that were led by guest speakers invited from outside the company. The seminar that was held in July 2002 was entitled, "Integrating Management Strategies and Environment Efforts to Create a Sustainable Company" and was led by Professor Ryoichi Yamamato, Head of the Center for Collaborative Research of the University of Tokyo. Approximately 300 employees attended this seminar, which described how firms must promote environmental management and become sustainable companies to ensure their corporate survival. The employees who attended this seminar came away with a greater understanding of the steps needed to achieve a sustainable company.

FY 2002 Seminars

Date	Seminar Title	Attendees
June 11, 2002	Seminar on Development of Environmentally Conscious Products at Toyota Motor Corporation	92
July 24, 2002	Integrating Management Strategies and Environmental Efforts to Create a Sustainable Company	309
March 12, 2003	ISO 19011 Compliance and Indirect Environmental Impact Assessments	145

Seminar led by Professor Ryoichi Yamamato (July 2002)

● Company Magazine

Toyota Industries uses its company magazine to highlight information about the environment and increase the environmental awareness of its employees. Noteworthy articles include one entitled, "Tackling the Challenge of a Green Industrial Revolution," which was published in the October 2002 edition of the company magazine, and another article entitled, "Issue of the Toyota Industries Group Corporate Commitment to the Environment," which was published in the January 2003 edition. The latter article describes the concept of environmental management adopted by Toyota Industries and the company's efforts to strengthen the implementation of environmental activities on a group-wide basis.

October 2002 Edition (company magazine)

January 2003 Edition (company magazine)

● Environmental Education Through Cinema

Toyota Industries began screening films with environmental themes during FY 2001, with the aim of promoting greater environmental awareness among its employees. The program was carried over into FY 2002 with a screening of the film "Waterworld" in June 2002. "Waterworld" is based on the future premise that humankind has been forced to live on the ocean due to global warming. The screening was followed by a discussion on global warming issues that included descriptions of the real-life example of the South Pacific nation of Tuvalu, where island residents are threatened with the possibility of having to abandon their homes due to rising sea levels caused by global warming. As a result of this discussion, many of the company's employees were made aware that the water-based existence portrayed in the film could become a reality in some parts of the world.

Environmental Accounting

Toyota Industries places a strong emphasis on environmental accounting as a core element of its environmental management efforts. The company is striving to effectively utilize environmental accounting principles and is taking an active approach to information disclosure.

Toyota Industries adopted environmental accounting practices in FY 1999. The company has since established in-house environmental accounting standards, which are presently based on the Environmental Accounting Guidelines (2002) published by Japan's Ministry of the Environment. In FY 2002, the company revised its environmental accounting standards in order to update its methods for tracking the effectiveness of its environmental activities.

In the future, Toyota Industries will continue to actively promote information disclosure and enhance its environmental accounting practices to serve as a decision-making tool for environmental management. Above all, the company will strive to improve the effectiveness of its environmental activities through the application of environmental accounting practices.

● FY 2002 Environmental Accounting Summary*1

Environmental Conservation Categories			Environmental Conservation Costs (millions of yen)		Economic Benefit*3 (millions of yen)		Environmental Conservation Benefit*4		Reference
			Investment*2	Expense*2					
Business area costs	Pollution prevention	Air pollution prevention	421	311		—	Reduced SOx emissions	13,313 m^3N	p.32
							Reduced NOx emissions	114 m^3N	
							Reduced VOC emissions	397 tons	p.30-31
		Water pollution prevention	838	414	Reduced wastewater processing costs	5	Reduced quantity of wastewater processing	81 km^3	p.32
							Reduction in total COD	1,556 kg	
							Increase in total nitrogen emissions	44 kg	
							Reduction in total phosphorous emissions	83 kg	
		Other	21	70		—	Reduced release and transfer of PRTR-designated substances	145 tons	p.30-31
	Global environmental conservation		1,208	1,073	Reduced energy consumption	447	Reduced CO_2 emissions	23 kt-CO_2	p.26-28
	Resource utilization	Industrial waste reduction	158	410	Gain on sale of reusable materials	863	Recycling volume*5	6,382 tons	p.34-35
					Increased costs for industrial waste processing	13			
		Water consumption reduction	122	3	Water conservation	46	Water conservation	1,026 tons	p.37
		Other resource utilization	21	10	Reduced consumption of paper products	6	Paper products conservation	34 tons	—
Upstream/downstream costs			1	31		—	Reduced CO_2 emissions and conversion to reusable packaging materials for logistics operations		p.38-39
Management costs			142	548			ISO 14001 certification of Higashichita Plant and Higashiura Plant		p.11
R&D costs			174	2,172			Development of electrically driven CO_2 compressor for car air-conditioners		p.5, p.25
							Reduced reliance on substances of concern		p.19
							Development of new environmentally conscious electric forklift truck		p.23
Social contribution costs			—	3			Financial contribution to Keidanren Nature Conservation Fund		p.40-41
Environmental remediation costs			5	53			Promoted purification of underground water and soil		p.15
Total			3,111	5,098	1,354				

*1 Environmental accounting was implemented for Toyota Industries' eight domestic plants and the Corporate Center/Business Support Center (CO/BS).
*2 Calculations include the environmental portion of investments and expenses that also have other components, as well as any differences in cost incurred by, for example, procuring environmentally conscious materials rather then less expensive materials. Depreciation is not factored into expenses.
*3 Earnings recorded as an environmental conservation benefit are taken directly from FY 2002 financial statements. Reductions in environmental costs are calculated by multiplying the environmental impact quantity by the unit cost.
*4 Environmental conservation benefits are calculated using the following formula:
Environmental Conservation Benefit = FY 2001 Environmental Impact by Quantity x (FY 2002 Net Sales/Net Sales During Reference Period) – FY 2002 Environmental Impact by Quantity
*5 Recycling volume: Volume of recycled industrial waste that had not been recycled in the past.

● FY 2002 Environmental Accounting Summary

In FY 2002, environmental conservation costs totaled 8.2 billion yen, consisting of 3.1 billion yen in investments and 5.1 billion yen in expenses. Toyota Industries' investments increased by 1.4 billion yen when compared with its FY 2001 investments. This increase is primarily due to equipment investments related to the following measures: construction of the Higashiura Plant, which began operating in July 2002, the adoption of cogeneration systems and other efforts to prevent global warming, and the adoption of powder coat equipment designed to reduce VOC emissions.

Expenses in FY 2002 were generally equivalent to FY 2001 levels. However, there was a decrease of approximately 300 million yen in environmental damage costs due to soil processing and soil improvements that were implemented as part of the company's groundwater purification measures in FY 2001.

Economic benefits from the company's environmental conservation activities totaled 1.4 billion yen, covering only those benefits that could be determined at the present time. The economic benefit from energy conservation activities increased by 130 million yen compared with FY 2001. In addition, costs related to industrial waste processing increased by 13 million yen due to increased recycling.

*Definitions of environmental conservation costs for environmental accounting can be found on p.55.

Risk Management

Toyota Industries is involved in a variety of activities targeting risk reduction.

Toyota Industries' business activities involve various environmental and other latent risks. Environmental risks can range from regulatory infractions to pollution of the surrounding area caused by the use of substances of concern. Toyota Industries strives to practice risk management in all of its business activities by eliminating or minimizing these risk factors.

● Emergency Response

Toyota Industries' manufacturing activities currently necessitate the use of certain chemical substances that can have a profound impact on the environment if mishandled. As part of its emergency response efforts, the company identifies equipment that has a significant risk of causing a major impact on the environment. Toyota Industries also conducts drills and inspections to prepare for potential environmental accidents caused by this equipment.

The company has formulated in-house guidelines to direct its response in the event of an emergency such as the accidental release of hazardous chemicals or irregularities with wastewater management. The guidelines include various routine checklists that are used to identify possible problems and the appropriate emergency response procedures, and also to verify the availability and proper functioning of emergency supplies and equipment.

Toyota Industries has also requested that its suppliers take the necessary measures to prevent accidental release and to take appropriate measures in the event of an emergency.

Emergency Response Drill

● Compliance with Laws and Regulations

Toyota Industries' business activities are regulated under various laws such as the Air Pollution Control Law and the Water Pollution Control Law. The corporate center and business support center (CO/BS) is responsible for monitoring ongoing revisions to these laws, and the relevant information is communicated to the company's plants. In addition, Toyota Industries has established voluntary control values for the designated pollutants that are stricter than the control values prescribed by pollution prevention laws. The company also conducts routine monitoring to ensure strict regulatory compliance. Toyota Industries received no citations for environmental infractions during FY 2002.

Applicable Laws and Regulations (in Japan)

Air Pollution Control Law, Water Pollution Control Law, Noise Regulation Law, Vibration Regulation Law, Offensive Odor Control Law, Electricity Utilities Industry Law, Waste Management and Public Cleansing Law, Poisonous and Deleterious Substances Control Law, Factory Location Law, Fire Service Law, Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their Management (PRTR Law), Law Concerning the Promotion of Measures to Cope with Global Warming

■ Examples of Regulatory Compliance

Plant Wastewater

Toyota Industries conducts in-house analyses of wastewater treatment as part of its wastewater management program. These results are used to ensure regulatory compliance and prevent possible regulatory infractions.

Waste

Toyota Industries uses in-house procedures to require that the company conducts prior inspections of waste disposal methods and facilities before engaging the services of a waste disposal contractor. The procedure leads to appropriate disposal methods for industrial waste.

Chemical Substances

Toyota Industries uses a prior assessment system to evaluate new chemical substances, in order to ensure compliance with the PRTR Law and other regulations. (For more information about chemical substance management, see p.30.)

Inspecting Facilities of a Waste Disposal Contractor

● Risk Communication

Toyota Industries formulated its Risk Communication Guidelines in April 2002 with the aim of promoting an active dialogue with interested parties and particularly with the local community. The Guidelines specify that each plant will hold regular meetings with members of the local community to disclose important information such as details of the chemical substance management implemented at plants and environmental data related to air, water and soil quality. (For more information about this subject, see p.40, “Working With the Community.”)

Risk Communication Guidelines

● Update on Soil and Groundwater Measures

■ Regular Report

Toyota Industries is involved in ongoing efforts to survey and purify polluted soil and groundwater that resulted from its past use of trichloroethylene. Under the guidance of local government authorities, Toyota Industries began voluntary monitoring of soil and groundwater contamination. These results were made available to the public in April 2001. Since that time, Toyota Industries has been routinely monitoring pollution levels and reporting its findings to local government authorities and the local community.

In addition to efforts aimed at purifying and preventing the outflow of pollutants beyond its plant boundaries, Toyota Industries is involved in efforts to purify and recover contaminated soil found within the boundaries of its plants. These ongoing efforts are being conducted using the soil excavation method, the iron powder mixing method and the vacuum gas extraction method. Toyota Industries is committed to providing regularly updated information regarding its efforts to purify and recover contaminated soil.

■ Recurrence Prevention Measures

Since the discovery of soil and groundwater contamination resulting from the company’s use of trichloroethylene, Toyota Industries has adopted measures aimed at preventing any recurrence of similar incidents. In February 2003, Toyota Industries formulated a new set of procedures for equipment installations with the aim of preventing soil contamination from occurring. These procedures specify that new storage facilities and piping for chemical substances are to be built above ground. In addition, the procedures contain new standards for equipment construction and methods for leakage prevention.

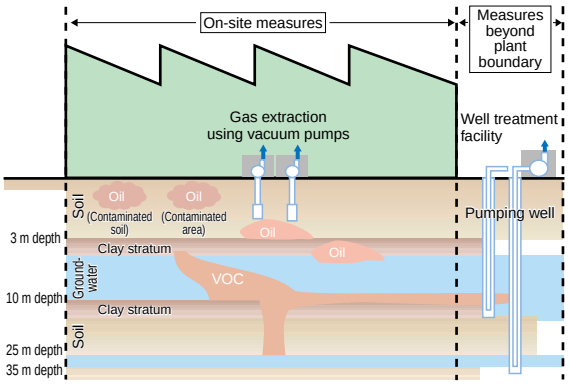
FY 2002 Trichloroethylene Readings

Plant	Average Reading Through FY 2002
Kariya Plant	1.46 mg/l
Kyowa Plant	1.59 mg/l

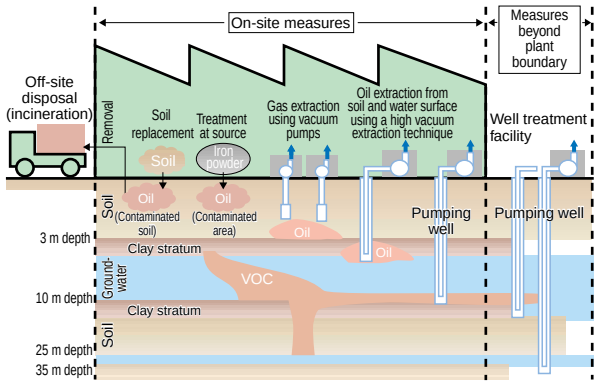
*No detectable trichloroethylene at other plants.
Reference value: 0.03 mg/l

Soil and Groundwater Purification

Previous Treatment Method (1998-2000)



New Treatment Method (2001-2002)



Spotlight Tokai Earthquake Preparations

Toyota Industries has created response manuals in preparation for the possibility of a serious earthquake occurring in the Tokai region.

In April 2002, Aichi Prefecture was officially designated as a potentially affected area in the event of a serious earthquake in the Tokai region. This official designation means that Aichi Prefecture has been targeted for upgraded seismic resistance measures. Since Toyota Industries and its plants are located in Aichi Prefecture, the company is currently conducting earthquake analysis for its building structures and is working to upgrade their seismic resistance. Toyota Industries also created a Crisis Response Manual and an Earthquake Response Manual that was published in February 2003. In addition, Toyota Industries plans to conduct detailed surveys and analyses to determine the potential environmental impact of a major earthquake and identify methods for preventing and counteracting the effects of a major earthquake. This will include creating a set of in-house guidelines for instituting earthquake-related measures.

Group-Wide Environmental Management

Toyota Industries is in the process of effecting a group-wide system for environmental management extending to its subsidiaries.

The Third Environmental Action Plan specifies that Toyota Industries and its subsidiaries will establish a support framework to assist in the creation of a group-wide environmental management system. These corporate objectives were established in order to respond to the increasing urgency of environmental issues occurring on a global scale.

In the past, Toyota Industries focused its efforts on assisting its subsidiaries in creating environmental management systems. However, the company also recognized the need for aggressive leadership in order to improve the efficiency of its environmental activities, resulting in the corporate goal of creating a global framework for implementing environmental activities throughout Toyota Industries and its subsidiaries.

In January 2003, Toyota Industries published the Toyota Industries Group Corporate Commitment to the Environment, which marked the beginning of its efforts to implement a system for group-wide environmental management. This system will be in place by FY 2005.

● Conceptual Framework

The Toyota Industries Group will have a system for group-wide environmental management in place by FY 2005, with full-scale implementation commencing in FY 2006. The system will comply with ISO 14001 standards and is designed to effectively utilize the environmental management systems that are already in place at Toyota Industries and many of its subsidiaries. In order to promote environmental activities on a group-wide basis, Toyota Industries is seeking to quantitatively measure the environmental impact of each of its subsidiaries and establish target values to be achieved by the group. Once completed, the system for group-wide environmental management will incorporate environmental accounting practices and improve dialogue both within the group and with relevant outside parties.

Requirements for Subsidiaries

Business Activity	Requirement
Manufacturing	-Establish an environmental management system and acquire ISO 14001 certification by FY 2005 -Submit environmental data -Submit report on operational status of environmental management system
Sales	-Promote activities based on sales guidelines and submit status reports -Promote activities based on overseas agent guidelines and submit status reports
Other	-Establish corporate environmental policy -Establish a simplified environmental management system -Implement activities to reduce environmental impact according to the subsidiary's impact level and submit status reports

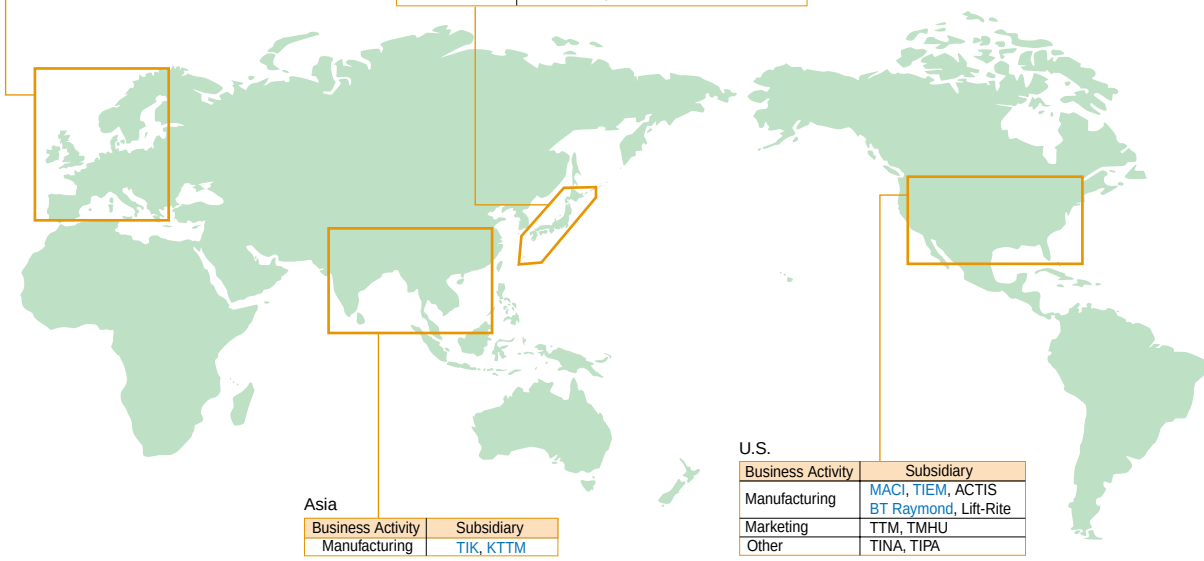
Scope of Toyota Industries' Group-Wide Environmental Management System (As of April 1, 2003)

Japan

Business Activity	Subsidiary
Manufacturing	TIBC, Tokyu, ST-LCD, Nishina, Tokaiseiki, Izumi Machine Mfg., SKE, Iwama Loom Works, Kawamoto System, Hara, Mizuho, Altex, Aichi
Sales	Toyota L&F Tokyo, Toyota L&F Keiji, Toyota L&F Shizuoka
Other	Sun River, Advanced Logistics Solutions, Toyota High System, Logistec, SK Maintenance, Shine's, Arti, Sun Valley, Sun Staff, Tokai System Institute, Taikoh Transportation

Europe

Business Activity	Subsidiary
Manufacturing	TIESA, TDDK, BT Products AB, CESAB Carrelli Elevatori S.p.A
Sales	TCEI, TIEUK, TIEE, TGD, TIE, TTN, TIEN, TTDK, TTUN, TTUDK
Other	TIS



Asia

Business Activity	Subsidiary
Manufacturing	TIK, KTTM

U.S.

Business Activity	Subsidiary
Manufacturing	MACI, TIEM, ACTIS BT Raymond, Lift-Rite
Marketing	TTM, TMHU
Other	TINA, TIPA

*Companies in blue have acquired ISO 14001 certification.

● FY 2002 Results

■ ISO Certification by Subsidiaries

Toyota Industries is involved in ongoing efforts to assist its subsidiaries in their attempts to create environmental management systems. Three subsidiaries acquired ISO 14001 certification in FY 2002: Taikoh Transportation Co., Ltd., Izumi Machine Mfg. Co., Ltd. and SKE Inc. Toyota Industries will continue to support these efforts with the goal of establishing environmental management systems at all of its manufacturing-related subsidiaries by FY 2005.

Schedule for ISO 14001 Certification

Subsidiary	Target Acquisition Date
Altex Co., Ltd.	August 2003
Mizuho Industry Co., Ltd.	September 2003
Kawamoto System Corporation	November 2003
Iwama Loom Works, Ltd.	December 2003
Hara Corporation	January 2004
Aichi Corporation	FY 2004

■ Group-Wide Environmental Management at Manufacturing Subsidiaries in Japan

Toyota Industries holds briefing sessions for its manufacturing-related subsidiaries in Japan. These sessions are designed to assist the subsidiaries in recognizing the importance of environmental management and to learn about the direction of future environmental activities. The briefing sessions also serve as a platform for Toyota Industries to request that its domestic manufacturing-related subsidiaries compile and submit environmental data. In January 2003, Toyota Industries issued Environmental Data Guidelines. These guidelines help to ensure that the subsidiaries use a uniform method for tracking environmental data.

The briefing sessions are followed up by hands-on sessions where attendees can check the accuracy of their submitted data and receive guidance on how to properly compile data for reporting.

Briefing Session for Manufacturing-Related Subsidiaries in Japan

■ Environmental Management at Overseas Subsidiaries

During FY 2002, staff of Toyota Industries made overseas visits to eight manufacturing-related subsidiaries in order to conduct briefing sessions aimed at providing updated information on the progress of environmental management and environmental activities. Subsidiaries also received information about the group-wide environmental management system to be established by the Toyota Industries Group. As a part of these meetings, discussions were held on a wide range of subjects including specific environmental management issues faced by each subsidiary and requests from subsidiaries. These discussions proved to be a valuable platform for sharing information and discussing ways of improving future communications between Toyota Industries and its overseas subsidiaries.

Briefing Session for BT Group

Future Activities

The table on the right shows the itinerary through FY 2006 for Toyota Industries to create a group-wide environmental management system. In FY 2003, the company will establish a system for tracking environmental performance data and adopt environmental accounting practices at its subsidiaries in Japan. Toyota Industries will also implement other efforts with an emphasis on creating a framework for tracking quantitative data.

Future Schedule

Description	Schedule				
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
Objective		Create group-wide EMS			Implement group-wide EMS
Issue Group Commitment to the Environment					
Establish framework for compiling environmental data		Establish framework	Compile environmental data		
Introduce environmental accounting methods		Introduce in Japan	Introduce overseas	Compile environmental accounting data	
Establish standards for operation of group-wide EMS		Create guidelines			
Hold group-wide production environmental conferences			Periodic conferences		
Establish group-wide objectives and targets					
Begin implementation of group-wide EMS					

Subsidiary Spotlight

Taikoh Transportation Co., Ltd. Acquires ISO 14001 Certification Introduction of Support Program

Taikoh Transportation Co., Ltd. is involved in the trucking business. In November 2002, Taikoh Transportation acquired ISO 14001 certification at its headquarters and three of its offices in Okazaki, Kariya and Handa. The company plans to acquire ISO 14001 certification for all 10 of its offices by the end of FY 2004.

Taikoh Transportation has created a support program in which its ISO-certified offices assist non-certified offices in their attempts to acquire ISO certification and to create environmental management systems. The program offers many advantages such as ensuring that environmental management systems are carried out at a practical level and eliminating inconsistencies in the coordination of environmental management systems between offices.

Taikoh Transportation has adopted a philosophy of “Motivation, attention to details and drive” for its system of internal environmental auditing. The company has appointed internal environmental auditors who are responsible for applying this philosophy in an effort to constantly improve the company’s system for internal environmental audits.

Poster Used to Promote Support Program

Masazumi Konishi
Senior Managing Director
Chairman, Product Technology Subcommittee

Product Technology Subcommittee

The environment is the major theme for the 21st century. The Product Technology Subcommittee at Toyota Industries is committed to identifying and reducing the environmental impact of our products through technological development.

Toyota Industries must fulfill its social responsibility to provide its customers with products that are both environmentally conscious and deliver unsurpassed reliability. In addition, it is essential that we continue to grow as an enterprise in order to ensure our corporate survival. To develop and provide environmentally conscious products, we must ensure that environmental considerations are included throughout the product life cycle, which begins with the development and procurement of raw materials and parts and extends through to the use and disposal of our products. Toyota Industries continues to place a strong emphasis on measures to promote the development of environmentally conscious products, and is aggressively involved in implementing these measures in all aspects of our company.

We stand by our commitment to develop products that are valued by our customers both in terms of performance and their contribution to environmental conservation.

Developing Environmentally Conscious Products

Toyota Industries is taking aggressive steps to develop environmentally conscious products.

Products affect the environment in various ways throughout the product life cycle, such as global warming due to energy consumption and the release of substances of concern during product disposal. The environmental impact of a product can be greatly decreased by taking appropriate measures at the product development stage. The Third Environmental Action Plan specifies that Toyota Industries will pursue the following major objectives as part of its product development and procurement efforts, namely to: (1) manage and reduce the use of substances of concern; (2) promote life cycle assessments (LCAs) of products; and (3) promote recyclable designs. The Third Environmental Action Plan also sets specific targets to be achieved by the company as it works to adopt environmentally conscious designs for its products.

Future efforts will focus on the creation of an environmental data system. Toyota Industries will also seek to enhance its product development efforts by providing its customers with environment-related product information and enhancing its system for sharing environmental information within the company.

Guidelines for Developing Environmentally Conscious Products

		Textile machinery	Compressors	Forklift trucks	Automobiles	Engines	Electronic equipment
Product Category							
Environmental Impact		•Global warming •Environmental pollution from disposal	•Depletion of natural resources •Air pollution •Global warming	•Air pollution •Environmental pollution from disposal •Depletion of natural resources	•Depletion of natural resources •Air pollution •Global warming •Environmental pollution from disposal	•Air pollution •Noise pollution	•Environmental pollution from disposal
Common Challenges	Manage and reduce the use of substances of concern (green procurement)	●	●	●	●	●	●
	Promote LCA of products	●	●	●	●	●	●
	Promote recyclable designs	●	●	●	●	●	●
Challenges by Product Category	Improve fuel efficiency	●	●	●	●	●	
	Reduce noise	●		●	●	●	
	Reduce exhaust gas emissions			●	●	●	
	Develop clean-energy vehicles		●	●			●
	Prevent global warming caused by car air-conditioners		●				

Management and Reduction of Substances of Concern

In step with efforts around the globe, Toyota Industries has set medium-range goals for managing and reducing the company's use of substances of concern.

Under the European Union's end-of-life vehicle (ELV) directive*, the use of lead, mercury, cadmium and hexavalent chromium will be banned from all vehicles sold in Europe starting from July 2003. In response to the ELV directive, Toyota Industries' Product Technology Subcommittee has established objectives aimed at reducing the company's reliance on substances of concern in all of its business activities including its non-vehicle related businesses.

During FY 2002, Toyota Industries made changes to the design of parts that previously contained lead, cadmium or hexavalent chromium and switched to using alternative chemical substances. Toyota Industries also asked its suppliers to submit data regarding the inclusion and quantity of banned substances in materials and parts supplied to the company, and also requested that its suppliers submit plans for eventually phasing out the use of banned substances. In addition, Toyota Industries revised its in-house guidelines for substances of concern to reflect the policy of banning certain designated chemical substances.

■ Reduced Lead and Hexavalent Chromium in 1HD-FTE Engine

The 1HD-FTE diesel engine was co-developed with Toyota Motor Corporation and is currently manufactured by Toyota Industries. Toyota Industries has achieved a 73% reduction compared to FY 2000 in the use of lead in the 1HD-FTE engine by first eliminating lead in the crankshaft assembly during FY 2001, and later eliminating lead in the valve seat material during FY 2002. Toyota Industries has also reduced the use of hexavalent chromium by changing the design of the bolt nuts and washers used in the 1HD-FTE. The company plans to completely phase out hexavalent chromium in the 1HD-FTE engine during FY 2006.

1HD-FTE Diesel Engine

■ Reducing Lead and Hexavalent Chromium in Car Air-Conditioning Compressors

Toyota Industries manufactures car air-conditioning compressors that contain trace amounts of lead and hexavalent chromium in their components. The lead comes from lead additives used to improve the cutting performance of aluminum materials during forging, while hexavalent chromium is used in galvanizing and rustproofing coatings for bolts.

Toyota Industries is continuing to focus its technological development efforts at reducing substances of concern such as lead and hexavalent chromium. The company previously set a goal of identifying alternative substances so that it could completely eliminate its reliance on certain substances, which Toyota Industries successfully achieved in FY 2002.

The European Union's end of life vehicle (ELV) directive includes a ban on hexavalent chromium starting from July 2007, as well as a ban on the use of lead in free-cutting aluminum starting from July 2008. Toyota Industries Compressor Division is currently working to eliminate both lead and hexavalent chromium in its compressor products by gradually switching over to the use of alternative compressor parts in FY 2003. These changes will allow the company to reach regulatory compliance well in advance of the ELV directive's ban on lead and hexavalent chromium.

7SBU16
Variable Displacement Compressor

Green Procurement

Toyota Industries is working hard to ensure that its procurement of materials and parts is environmentally conscious.

Since March 2001, the company has incorporated green procurement practices as part of its corporate mandate to procure parts, raw materials and indirect materials that have a low environmental impact. In order to promote green procurement, Toyota Industries has asked its suppliers to satisfy the following prerequisites for continued procurement:

1. Establish an environmental management system (EMS).

2. Implement management of substances of concern and eliminate the use of banned substances.

During FY 2002, Toyota Industries revised its Environmentally Preferable Purchasing Guidelines and held briefing sessions on the subject of green procurement. The company also held seminars that were designed to assist its suppliers in their efforts to create environmental management systems.

■ Publication of Revised Environmentally Preferable Purchasing Guidelines

Toyota Industries revised its Environmentally Preferable Purchasing Guidelines in February 2003. The revisions were designed to reflect further tightening of regulatory restrictions since the original publication of the Guidelines in March 2001, including the stricter management of chemical substances required by the EU's new ELV directive. The revised Guidelines now include various forms that are used by suppliers to declare that banned substances are not used in their materials or parts.

Environmentally Preferable Purchasing Guidelines (2nd Edition)

■ Supplier Briefing Sessions on Green Procurement

During FY 2002, Toyota Industries held two briefing sessions on green procurement, in October 2002 and February 2003. The briefing sessions were attended by suppliers for all of Toyota Industries' business units. In addition to providing information on regulatory trends and the company's Green Procurement Guidelines, the briefing sessions provided an opportunity for Toyota Industries to ask for greater cooperative efforts from its suppliers.

Briefing Session on Green Procurement

*ELV directive: The end-of-life vehicle (ELV) directive has been adopted by the European Union to reduce the environmental impact and improve recyclability during the scrapping of used vehicles.

Life Cycle Assessments (LCAs)

Toyota Industries is committed to establishing a reliable and efficient LCA methodology in order to develop products that are environmentally conscious.

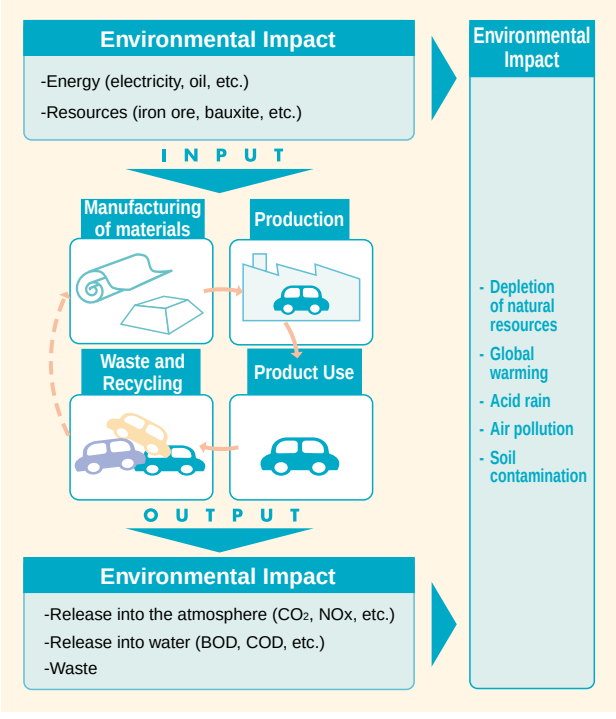
LCAs are used for quantitative analysis and assessment of a product's environmental impact throughout its entire life cycle, which includes the manufacturing of materials, production, product use, disposal and product recycling. LCAs also encompass the energy and resources expended at each stage of the life cycle, as well as the environmental impact on the air, water and soil quality throughout the product life cycle.

Toyota Industries' Product Technology Subcommittee is responsible for promoting activities that incorporate LCAs. The Subcommittee first began studying possible application of LCAs during the second half of FY 1999. In subsequent years, the Subcommittee has conducted LCAs for engines and forklift trucks in FY 2000 and FY 2001 respectively. For more information about these assessments, please refer to the Environmental Report 2001 and the Environmental Report 2002.

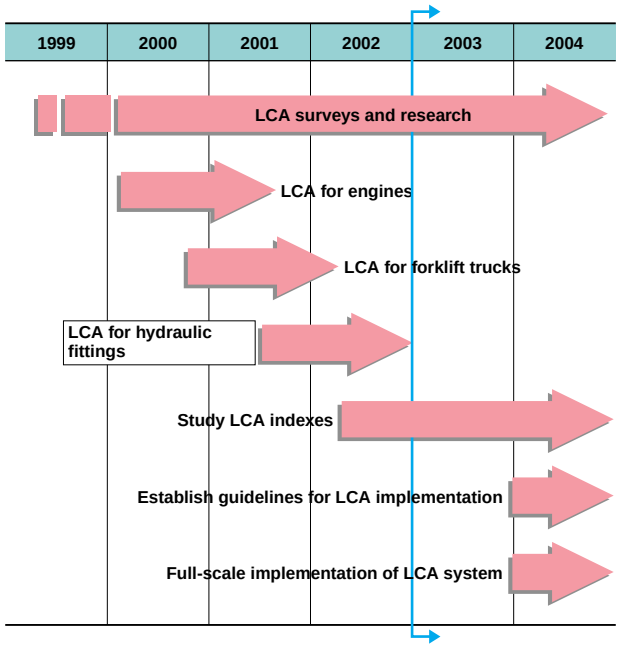
LCAs were originally intended to be used for finished products in order to assess and quantify the environmental consciousness of a product. However, LCAs are increasingly being used as the basis for Design-for-Environment programs (DfE), in which environmental considerations are systematically integrated into the product and process design.

LCAs can be time-consuming to implement as part of the product development process. Consequently, Toyota Industries is working to create an LCA methodology that can be quickly and reliably implemented within the available time frame for development.

The LCA Concept



Time-line for LCA Activities



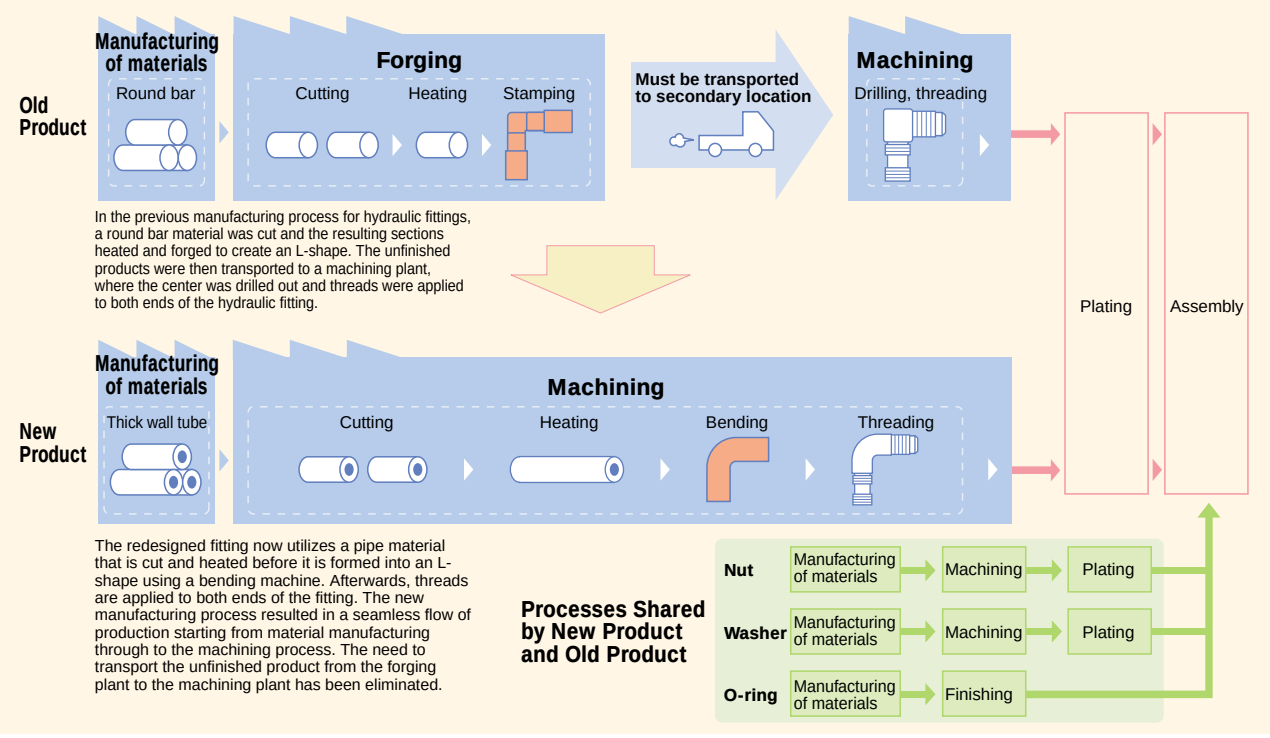
● FY 2002 Measures

In FY 2002, Toyota Industries conducted life cycle assessments focused on the manufacturing phase for both old- and new-style hydraulic fittings (see below) used in forklift trucks, assessing the amount of reduction in pollutants released into the air in the manufacturing process for the new-style fittings.

Hydraulic Fittings

LCA of Hydraulic Fittings

Comparison of Manufacturing Processes



Hydraulic Fitting Assessment

The life cycle assessment for hydraulic fittings was restricted to the manufacturing stage, commencing with the manufacturing of materials used for the fittings. Toyota Industries chose to focus the assessment on the manufacturing stage due to its impact on the cost of manufacturing the product. The assessment precluded the non-manufacturing stages of the product life cycle such as the product use, disposal and product recycling stages.

In order to assess the processes used in common by the old and new products, Toyota Industries made use of both published values and database values that are included in commercial LCA software. In contrast, all unique processes were assessed and compared using the following three assessment methods, due to the potential cost reduction and their impact on the overall assessment results:

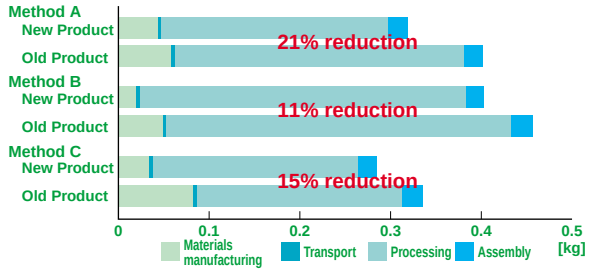
Method A: Assessment based on survey of actual energy consumption
Method B: Assessment based on functional unit* used for household appliances
Method C: Assessment based on functional unit used for automotive parts

*Functional unit: CO_2 emissions per material mass in a production process.

Assessment Results

The Method A assessment resulted in the greatest difference between the new and old products. The difference was smaller when using the Method B and Method C assessments despite the process change from forging to bending, which significantly reduces the overall energy consumed in manufacturing the new product. The variation between the various assessment results was caused by the absence of a functional unit for the forging process, which resulted in its exclusion from the assessment results for the Method B and Method C assessments. Therefore, the absence of a functional unit resulted in an over assessment of CO_2 emissions in the Method B assessment and an under assessment in the Method C assessment.

CO_2 Emissions per Product



*Percentages represent the difference in CO_2 emissions between the new and old products.

Future Activities

Toyota Industries will focus its future efforts on identifying functional units to be used in future life cycle assessments, which will help it to conduct assessments more efficiently within the available time frame for development of the product.

In order to achieve this goal, the company will measure the actual environmental impact when the functional unit used has a significant impact on the LCA results. In terms of using existing functional units, Toyota Industries will determine the source of the functional unit and establish a system that will allow it to verify the assessment results.

Furthermore, Toyota Industries will concentrate on creating an efficient and reliable LCA methodology that builds upon previous assessments and research. The company will establish a system so that life cycle assessments can be rapidly conducted at the product development stage, with the aim of assessing the environmental impact of the product throughout its life cycle.

Recycling

Toyota Industries revised its in-house recycling design guidelines in response to the introduction of international standards for recyclability evaluation.

Toyota Industries is strongly committed to the concept of recycling design, based on the principle of "reduce, reuse and recycle"—in that order of priority. The company believes that reusing rather than recycling and reducing rather than reusing will result in the least impact on the global environment. In addition, Toyota Industries is directing its recycling design efforts toward increasing the life of its products as a means of reducing their environmental impact.

In FY 2002, Toyota Industries revised its in-house recycling design guidelines in order to continue to promote recycling design. In addition, the company carried out surveys used to monitor the disposal of its products. The survey results were used to guide product development efforts within the company.

■ Revised Recycling Design Guidelines

Toyota Industries published its original Recyclable Design Guidelines in March 2001, in order to promote recyclable design on a company-wide basis. The company revised the Guidelines in FY 2002 in response to new ISO standards, which came about as a result of the European Union's adoption of the ELV directive. The ELV directive sets minimum standards for recyclability in vehicles sold in Europe starting from 2005.

The revisions to the company's Recyclable Design Guidelines led to several new efforts during FY 2002. For example, the company set about reducing its reliance on PVCs that are known to release toxic gases during incineration. Toyota Industries also began to label its plastic and rubber parts to indicate the material composition for the purpose of recyclability calculations.

■ Automotive Wrecking Survey

Based on the recent introduction of Japanese regulations such as the Automobile Recycling Law and the Fluorocarbons Recovery and Destruction Law, Toyota Industries continued to conduct field surveys regarding the disposal of automobiles, which it first began surveying in FY 2001, and confirmed methods for the reclamation of hydrofluorocarbons (HFCs) from car air-conditioners and the disassembly and recycling of airbag systems from cars.

Toyota Industries also conducted a field survey regarding the scrapping and disassembly of forklift trucks. The results from this survey helped to reinforce the importance of recycling design.

Disassembly of Automobile

■ Extended Life Forklift Survey

In FY 2002, Toyota Industries conducted a field survey of its G3 automatic looms, which were originally introduced in 1961 and are still being used today. In FY 2002, the company conducted a field survey on the 5LR forklift truck, which was originally introduced in 1967.

Recycling design requires an optimal balance of cost reduction, safety and durability in a product. These characteristics are all found in the 5LR forklift truck. Toyota Industries is committed to promoting extended-life products as part of its activities to incorporate recyclable design into its products.

Toyota Industries 5LR Forklift Truck (Manufactured in 1967)

Future Activities

Toyota Industries will create an environmental data system starting from FY 2003. The system will be used for calculating the recyclability of its products, and for determining the amounts of substances of concern used in these products. The system will also assist in the conducting of life cycle assessments and recyclability evaluations in a precise and rapid manner. The creation of an environmental data system will also help Toyota Industries to continue to develop environmentally conscious products for the long term.

Subsidiary Spotlight

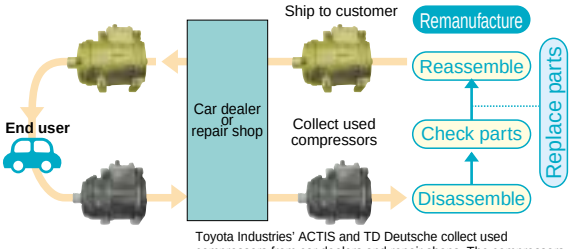
Remanufacturing Car Air-Conditioning Compressors

In the U.S. and Europe, demand is increasing for reconditioned or remanufactured automotive components, reflecting social and environmental needs for more efficient utilization of parts and resources. In response to this trend, ACTIS Manufacturing, Ltd. LLC in North America and TD Deutche Kilmakompressor GmbH in Europe have begun remanufacturing car air-conditioning compressors. The two companies disassemble used compressors, replace worn parts with new ones, then reassemble the units for sale as remanufactured compressors.

In 2002, the two subsidiaries sold approximately 50,000 compressors to the U.S. and European aftermarkets.

Toyota Industries is committed to making contributions to resource conservation by increasing the number of remanufactured products it sells in the future.

Remanufacturing Process



Toyota Industries' ACTIS and TD Deutsche collect used compressors from car dealers and repair shops. The compressors are remanufactured and later resold to dealers and repair shops.

Environmentally Conscious Products

Toyota Industries is incorporating environmentally conscious designs in all of its products.

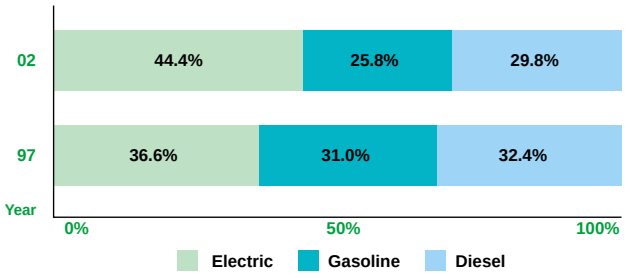
■ Environmentally Conscious Forklift Trucks

The forklift truck manufacturing industries has continued to witness growing demand for environmentally conscious forklift trucks and electric forklift trucks that produce less vibration, noise and exhaust gas emissions. Toyota Industries recently developed the new GENEO-E (7FBE outside Japan) forklift truck, as part of its best-selling GENEO series (7 series) of forklift trucks. The GENEO-E forklift truck is a three-wheel, electric counterbalanced forklift that is designed to meet a wide range of needs. The GENEO-E was released in January 2003 and is equipped with the SAS-AC*1 system, a combined safety system, and an AC (alternating current) power system.

In addition, Toyota Industries expanded its line of GENEO-B electric counterbalanced forklift trucks (7FB outside Japan) by adding 3.5-4.5 ton capacity units. The company also added a new 0.9 ton capacity unit to the GENEO-R series of electric reach trucks (7FBR outside Japan). All of the above models were released together in the Japanese market in December 2002.

Toyota Industries also enhanced its line of gas-powered forklift trucks by reducing exhaust gas emissions and adding versions that run on compressed natural gas (CNG). The CNG-powered forklift trucks help to reduce the CO_2 emissions that contribute to global warming, and have almost completely eliminated SOx emissions, which can cause acid rain.

Domestic Forklift Truck Sales by Engine Type Data from the Japan Industrial Vehicles Association (JIVA)



GENEO-B
Electric Counterbalanced
Forklift Truck
(7FB outside Japan)

GENEO-E
Three-Wheel Electric
Counterbalanced
Forklift Truck
(7FBE outside Japan)

■ Development of Low Emission*2 Diesel Engine

Diesel engines operate at a high thermal efficiency for better fuel efficiency, which makes them effective in preventing global warming. However, increasingly strict regulations are being placed on exhaust gas emissions from diesel engines, which has prompted Toyota Industries to place great emphasis on achieving regulatory compliance with exhaust gas emission standards as part of its development efforts for diesel engines.

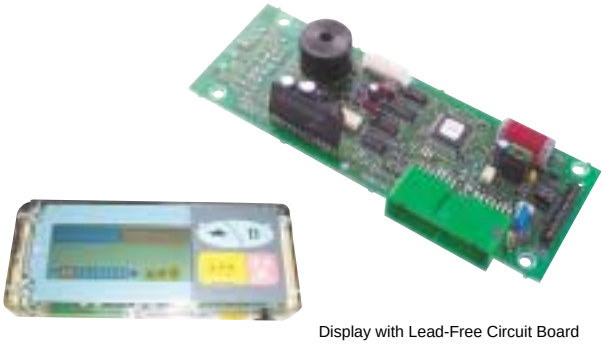
Toyota Industries recently redesigned its 2Z direct injection diesel engine in order to comply with Japanese 2003 exhaust gas emission standards for forklift trucks and other special vehicles. The 2Z diesel engine is used in the company's GENEO series (7 series outside Japan) of diesel forklift trucks, which are available in capacities ranging from 2.0 to 3.5 tons. The redesigned 2Z engine uses an improved injection pump that delivers optimal injection timing performance and secondary injection suppression, as well as an improved injection nozzle that offers fine misting performance. As a result of these changes, the redesigned 2Z diesel engine delivers reduced traces of NOx, total hydrocarbon (THC) and particulate matter (PM) emissions in exhaust gas emissions.

2Z Direct Injection Diesel Engine

■ Lead-Free Circuit Boards

Lead contained in solder used in circuit boards has been noted for polluting the environment when it is not properly disposed of. Consequently, Toyota Industries is trying to switch to lead-free solder in its circuit boards for its industrial machinery, automobiles and textile machinery products.

When designing circuit boards with lead-free solder, Toyota Industries had to overcome various issues such as the high melting point of lead-free solder, which made it difficult to control soldering temperatures while ensuring that parts could stand the heat. However, Toyota Industries was successful in overcoming these issues and in January 2003 began producing lead-free circuit boards for use in the displays for one of its electric reach truck models.



Display with Lead-Free Circuit Board

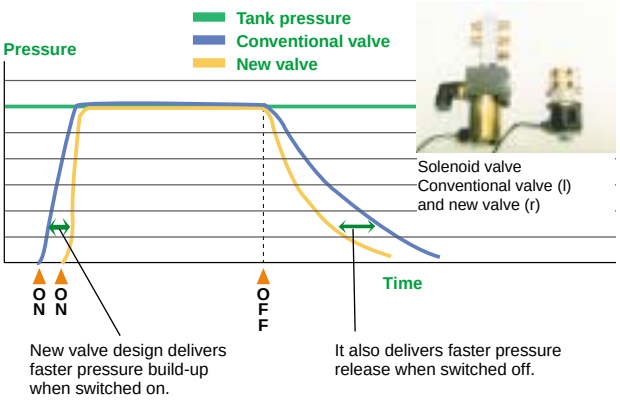
*1 SAS-AC System of Active Stability and AC Power Control: A safety system that uses an electric-hydraulic control system to prevent operating errors and lateral tipping during rapid maneuvering.
*2 Low emission: Indicates exhaust gas emissions low in CO, NOx and particulate matter (PM).

■ Energy Conservation

Textile machinery has a tendency to consume large amounts of energy during operation. When Toyota Industries set about developing an environmentally conscious air jet loom, the company had to reduce the consumption of air used to insert weft yarn. Toyota Industries was eventually successful in developing the new JAT710 Air Jet Loom, which boasts greater energy efficiency and 20% less air consumption. The new air jet loom was made possible by the company's development of a new air solenoid valve* that is smaller and offers faster pressure build-up and better release performance than its predecessors.

JAT710 Air Jet Loom

Pressure Characteristics of New Air Solenoid Valve



Subsidiary Spotlight

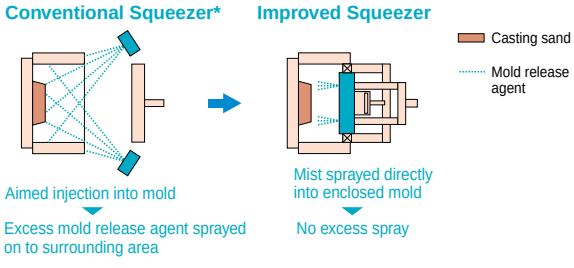
Tokyu Co., Ltd.

New Flaskless Molding Machine Consumes 20% Less Power and Is 10 dB Quieter than Conventional Machines

Tokyu Co., Ltd. develops and manufactures forging machinery. Since acquiring ISO 14001 certification in November 2001, Tokyu has been actively working to reduce the environmental impact of its manufacturing activities. In addition, the company has also taken steps to reduce the environmental impact of its products.

One area that Tokyu is involved in is the design and manufacturing of flaskless molding machines. In FY 2002, the company released the new AMF V flaskless molding machine, which is 10 dB quieter and consumes 20% less power than conventional machines. The reduced power consumption was achieved by redesigning the sand feed system and using a new injection method for mold release agents. The latter change helped to reduce the power consumption in the hydraulic unit and the amount of air consumed by the machine. Noise reduction was achieved by decreasing the size of the hydraulic pump and by improving the air blow system.

Improved Injection Method for Mold Release Agents



*Squeezer: Device used to squeeze casting sand into mold

New AMF V Flaskless Molding Machine

Advanced Logistics Solutions Co., Ltd.

Subsidiary Specializes in Logistics Solutions that Combine Logistics Efficiency and Environmental Efficiency

In March 2002, Toyota Industries established a new subsidiary, Advanced Logistics Solutions Co., Ltd. (ALSO), which plans overall logistics operations (including distribution) and operates distribution centers. We aim to respond to increasing market needs for streamlined logistics by utilizing our longstanding experience in the production and sale of materials handling equipment, such as forklift trucks and automated storage and retrieval systems.

ALSO seeks to provide logistics solutions that are both logistically efficient and environmentally conscious. The company's expertise is rooted in the Toyota Production System, which was originally formulated by Toyota Motor Corporation. ALSO applies these concepts to logistics operations to reduce overburden, waste, and unevenness existing in operations, and consequently helping preserve the environment.

ALSO currently manages both a parts distribution center for industrial vehicles that is located in Toyota Industries' Takahama Plant, and distribution centers for pharmaceutical products and convenience store products providing efficient logistics solutions. The company will seek further growth by providing optimized logistics solutions for a wide range of firms involved in manufacturing food, distribution, and other business areas.

*Solenoid valve: A direction control valve used to control the flow of air or hydraulic fluid. When a current is supplied to the internal magnetic coil, the valve is operated using magnetic force.

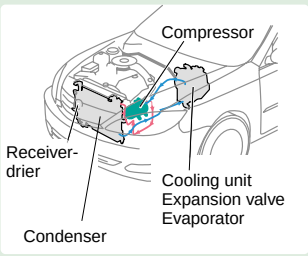
Spotlight **Car Air-Conditioning Compressors**

Toyota Industries continues to lead the industry through its efforts to reduce the environmental impact of car air-conditioning compressors.

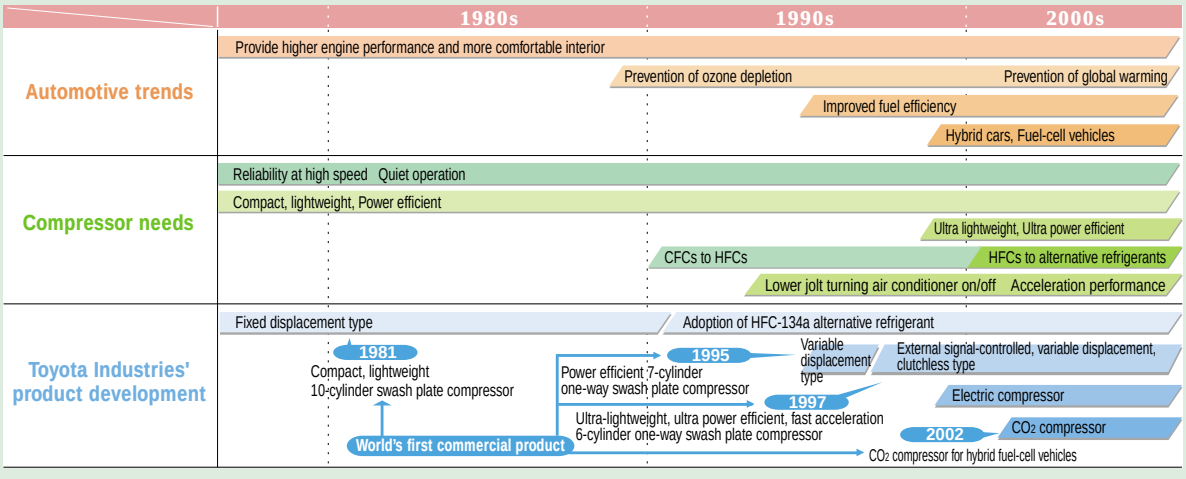
The company has made its compressors lighter to improve fuel efficiency and is exploring the use of natural refrigerants for its compressors.

In December 2002, the Japanese government took delivery of four revolutionary hydrogen-powered fuel-cell hybrid vehicles developed by Toyota Motor Corporation. These cars were equipped with an electrically driven CO_2 compressor that Toyota Industries jointly developed with DENSO Corporation. CO_2 is a natural refrigerant.

In addition to offering outstanding cooling performance and durability, the new compressor is ideally positioned for use in the next generation of vehicles, since it contributes to protect ozone layer depletion and to slow down global warming. Major technological leaps in compressor technology have always been triggered by society's increasing concern for the environment.



Automotive Trends and Toyota Industries' Compressor Product Development



●Improving Fuel Efficiency

Since the 1990s, Toyota Industries has continually sought to improve the fuel efficiency of its compressor products in an attempt to minimize air pollution and prevent global warming. The company's efforts have been focused on reducing weight and improving the efficiency of its compressors.

■ Weight Savings Made Possible by Advanced Technologies

Toyota Industries has led the compressor industry through its aggressive efforts to incorporate aluminum in its compressor products. Aluminum is lighter than other materials but also lacks strength. Toyota Industries has succeeded in reducing the weight of its compressors by carefully selecting appropriate materials that are shaped for optimum performance. This same expertise was also used in the development of the company's CO_2 compressor.

■ World's First Variable Displacement Compressor with One-Way Swash Plate

Toyota Industries developed the world's first variable displacement compressor with a one-way swash plate. This compressor delivers a variable output displacement in response to external variables such as the outside temperature, sunlight and driving speed. Toyota Industries developed this compressor based on the need for improved cabin comfort, faster acceleration and improved fuel efficiency.

In response to the increasing interest in environmental conservation and fuel efficiency, Toyota Industries developed an external signal-controlled, variable displacement, clutchless compressor. This compressor offers dramatically improved fuel efficiency for air conditioners by incorporating sensors that detect changes in engine acceleration and other external variables.

Future Activities

Toyota Industries will continue its efforts to improve the fuel efficiency of its compressor products by focusing on its proprietary weight reduction technology and external signal-controlled, variable displacement compressor technology. The company will also expand its line of variable displacement compressors in order to offer environmentally conscious compressors for all applications. Furthermore, Toyota Industries will develop new compressors that offer outstanding fuel economy for use in hybrid and fuel-cell vehicles.

●Switching Refrigerants

In 1991, in response to concerns over ozone depletion, Toyota Industries began switching from CFC-12 chlorofluorocarbon-based refrigerants to HFC-134a hydrofluorocarbon-based refrigerants for use in its car air-conditioning compressors. Since then, research has indicated that the global warming potential (GWP) of HFC-134a is still 1,300 times greater than CO_2, which has led the company to explore new refrigerants that are friendlier to the environment. Toyota Industries is actively working to develop compressors that use alternative refrigerants.

■ Lubricants and Sealing Materials

As a byproduct of its successful development of hydrofluorocarbon-based compressors, Toyota Industries has succeeded in developing lubricants and sealing materials that are free of chlorofluorocarbons.

Future Activities

Experts are currently predicting that the natural refrigerant CO_2 will eventually become the refrigerant of choice for car air-conditioning compressors. However, CO_2 has several drawbacks, such as a low molecular weight allowing easy passage through rubber and other sealing materials, and a high operating pressure that requires greater component strength than was needed before.

Toyota Industries is confident that its successful attempts to develop an electrically driven CO_2 compressor for Toyota's fuel-cell hybrid vehicle will also lead to the development of a similar CO_2 compressor to be used in standard engine vehicles.

Electrically Driven CO_2 Compressor

Iwao Katayama
Managing Director
Chairman,
Energy Subcommittee

Energy Subcommittee

The Subcommittee's efforts are guided by Toyota Industries' commitment to preventing global warming through the reduction of CO_2 emissions.

Toyota Industries' Energy Subcommittee was established approximately a decade ago, in 1993. Its role was to develop measures aimed at dealing with critical and challenging environmental issues occurring on a global scale. Recently, it has been reported that certain islands in the South Pacific are being threatened by rising sea levels caused by global warming. In addition, the worldwide move toward ratification of the Kyoto Protocol has placed greater expectations on corporations to shoulder the load of reducing CO_2 emissions. Reducing CO_2 emissions within the context of increased production offers a significant challenge for Toyota Industries. However, we are committed to reaching this goal through a variety of means including the large-scale adoption of energy conservation equipment and the systematic reduction of CO_2 emissions.

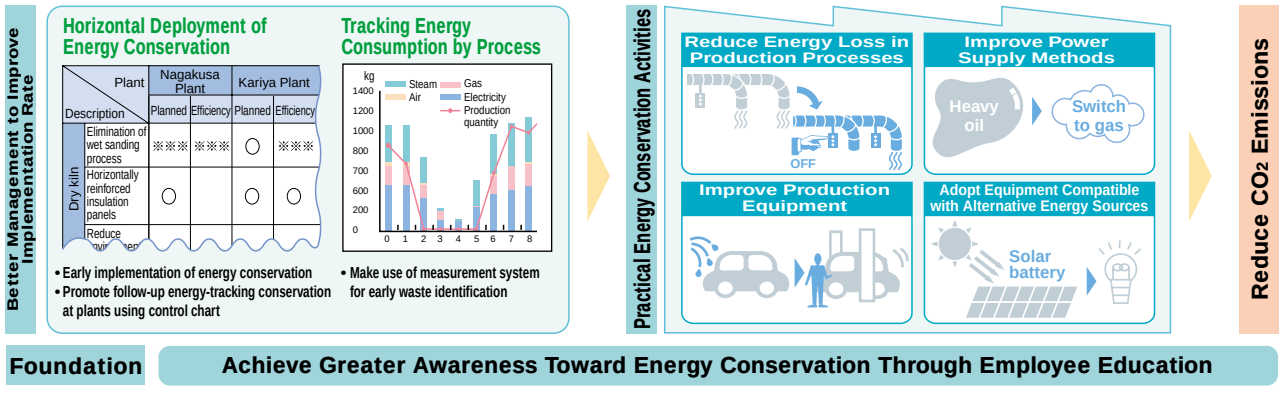
Energy Conservation Activities

Toyota Industries' energy conservation efforts are focused on four major activities that are designed to prevent global warming.

● Medium Range Goals and Major Objectives

Toyota Industries' business activities affect the environment in a variety of ways through CO_2 emissions caused by energy consumption. Casting and other production processes have a particularly significant environmental impact, but product development and management activities are also sources of energy consumption. Toyota Industries' Third Environmental Action Plan sets a goal of achieving a 5% reduction in total CO_2 emissions by the end of FY 2005 (based on FY 1990 levels) in order to reduce the company's environmental impact and prevent global warming. In addition, to pursue this goal through a variety of measures, Toyota Industries set the following major objectives in the Third Environmental Action Plan: (1) reduce the energy loss from product processes; (2) improve power supply methods; (3) improve production equipment; and (4) adopt equipment compatible with alternative energy sources. Toyota Industries is fully committed to carrying out these major objectives through better management and greater awareness toward energy conservation among its employees.

Energy Conservation Activities from the Perspective of CO_2 Emissions

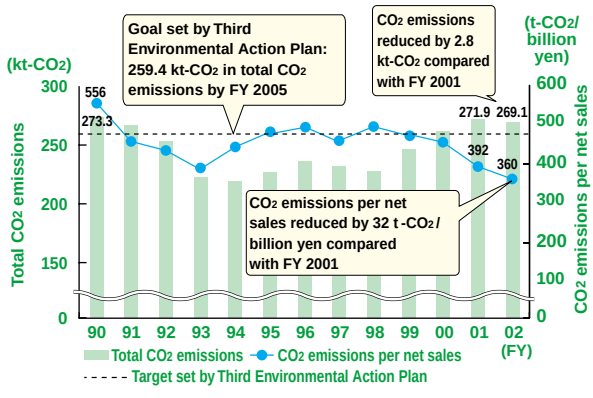


● FY 2002 Achievements

In FY 2002, Toyota Industries focused its efforts on achieving the company's short term goal of reducing its total CO_2 emissions to 254.1 kt-CO_2 and its CO_2 emissions on net sales basis to 386 t-CO_2 per billion yen. However, the company was unable to meet its total CO_2 emissions goal for FY 2002 due to increased production and to the start of operations at the company's new Higashiura Plant.

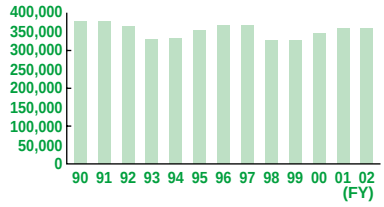
The company's total CO_2 emissions for FY 2002 were 269.1 kt-CO_2, or a decrease of 2.8 kt-CO_2 over the previous fiscal year. The decrease in total CO_2 emissions was primarily due to Toyota Industries' activities to conserve energy, which placed a strong emphasis on improving power supply sources and reducing energy loss from the company's production lines. On a net sales basis, the company's CO_2 emissions were 360 t-CO_2 per billion yen, which was a decrease of 32 t-CO_2 per billion yen from FY 2001 and represented a 35% decrease from FY 1990 levels.

Total CO_2 Emissions and CO_2 Emissions Per Net Sales

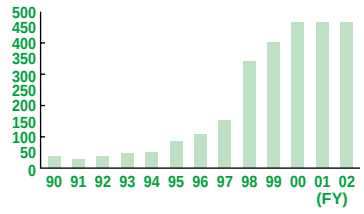


Energy Consumption

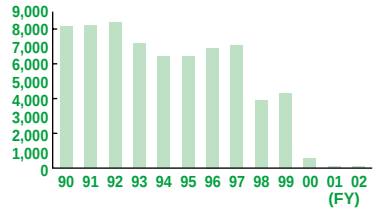
● Purchased Electric Power (MWh)



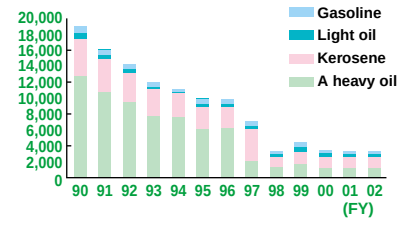
● City Gas (km³)



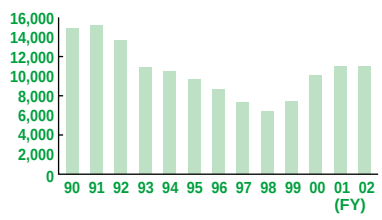
● Liquid Petroleum Gas (1,000 kg)



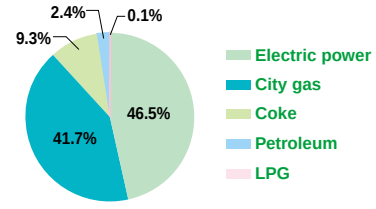
● Petroleum (kℓ)



● Coke (t)



● FY 2002 Energy Sources (In terms of CO_2 Emission)



*CO_2 Emissions: Carbon dioxide produced by energy consumption in the form of electricity, gas or fuel. Includes CO_2 emission data dating back to FY 1990 for Toyota-Sulzer Manufacturing Ltd., a joint venture that became a wholly-owned subsidiary of Toyota Industries in October 2001. Starting from FY 2002, the CO_2 emission conversion factor was changed from a thermal power generation factor to a total power factor.

CO_2 Emission Conversion Factors

Electric power	0.3817kg-CO_2/kWh	Kerosene	2.5308kg-CO_2/l
City gas	2.3576kg-CO_2/m³	Light oil	2.6468kg-CO_2/l
LPG	3.0094kg-CO_2/kg	Gasoline	2.3609kg-CO_2/l
A heavy oil	2.7000kg-CO_2/l	Coke	3.2502kg-CO_2/kg

● FY 2002 Measures

Description	Measure	Plant
Reduce energy loss from product processes	-Discontinue energy plan and reduce power use during non-operation	All plants
	-Reduce air leakage	
	-Selective operation of lighting fixtures	
Improve power supply methods	-Improve efficiency of air compressors	Hekinan Plant
	-Switch energy source for heaters from heavy oil to city gas	Kariya Plant
	-Install demand controlled devices for air-conditioning	Kariya Plant See Case Study D
Improve production equipment	-Eliminate car wash process from vehicle painting lines	Nagakusa Plant See Case Study C
	-Reduce consumption of cupola coke	Higashichita Plant See Case Study B
Adopt equipment compatible with alternative energy sources	-Adopt cogeneration systems	Kyowa Plant See Case Study A
	-Adopt micro gas turbine, solar power and wind power systems	Higashiura Plant, e-Lab See p.29

■ Adoption of Equipment Compatible with Alternative Energy Sources

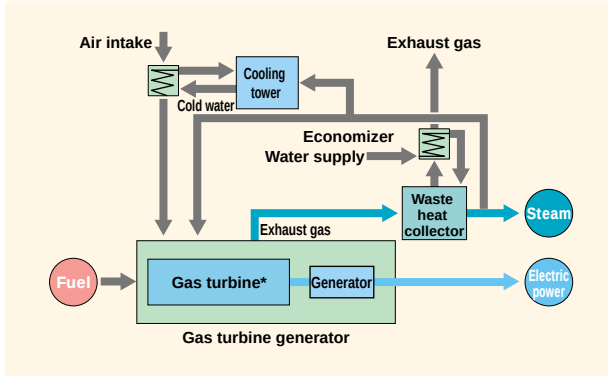
Case Study A Adoption of Cogeneration System by Kyowa Plant (Annual CO_2 emission reduction: 10.5 kt-CO_2)

The Kyowa Plant is the fifth Toyota Industries facility to adopt a cogeneration system. Cogeneration systems use a clean energy source to supply electric power and steam to production processes. The cogeneration system at the Kyowa Plant uses city gas for its energy source. Furthermore, the advanced cogeneration system in use at the Kyowa Plant is capable of producing a variable output of electric power and steam. The energy efficiency of the system is further enhanced by the use of an air intake cooling system.

The adoption of a cogeneration system at the Kyowa Plant, although increasing the annual consumption of city gas to approximately 13,800 km³, will reduce the plant's purchased power needs by about 47,000 MWh annually.

Plants with Cogeneration Systems	Kariya, Nagakusa, Takahama, Hekinan, Kyowa

Cogeneration System



*Gas turbine: A system in which compressed air and fuel is burned to produce a high temperature and high pressure gas that drives turbines.

Case Study B Reduction of Coke Use in Cupola of Higashichita Plant (Annual CO_2 emission reduction: 7.4 kt-CO_2)

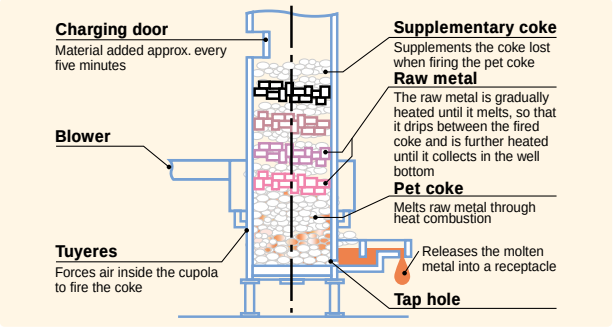
Toyota Industries' Higashichita Plant manufactures foundry parts such as engine blocks. Castings are manufactured by placing coke fuel and raw metal such as pig iron in a furnace known as a cupola. Combustion heat is then used to fire the coke and melt the raw metal, which is poured into a mold to create the casting.

At the Higashichita Plant, Toyota Industries made the following improvements to successfully reduce the energy consumption of its casting processes:

1. Reduced the ratio of coke use
2. Reused a greater proportion of raw metal returns* from casting processes
3. Increased the coke particle size

The above improvements have enabled the Higashichita Plant to reduce its coke consumption by 2,300 tons annually.

Cupola Construction



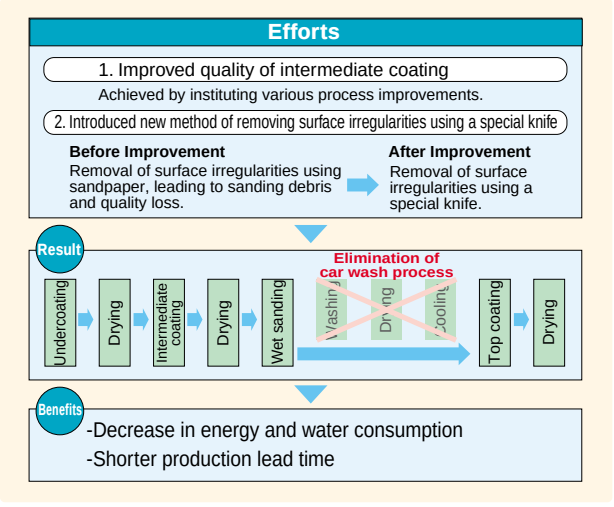
■ Improvements to Production Equipment

Case Study C Elimination of Car Wash Process from Painting Line at Nagakusa Plant (Annual CO_2 emission reduction: 740 t-CO_2)

The process of painting an automobile consists of separate undercoating, intermediate coating and top coating processes. After the intermediate coat is applied, a wet sanding process is undertaken to remove any surface irregularities, and then the car is washed. By making various improvements to the intermediate coating process during FY 2002, Toyota Industries' Nagakusa Plant achieved an intermediate coating quality that effectively eliminated the car wash process in its intermediate painting line. The elimination of this process helped to shorten the overall painting process and is expected to reduce the plant's CO_2 emissions by about 740 t-CO_2 annually. Furthermore, the Nagakusa Plant was able to save about 1,200 m^2 of floor space by eliminating the car wash process.

Removal of Surface Irregularities Using a Special Knife in a Wet Sanding Process

Elimination of Car Wash Process



■ Improving Efficiency of Moving Equipment

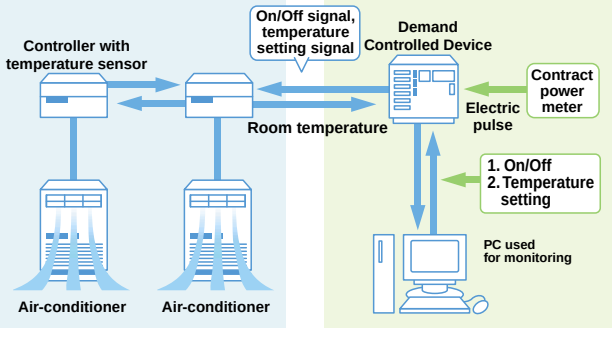
Case Study D Adoption of Demand Controlled Devices at Kariya Plant (Annual CO_2 emission reduction: 55 t-CO_2)

Toyota Industries' Kariya Plant has achieved significant energy savings by instituting appropriate temperature control measures for its air-conditioning systems. During the month of July, the plant's air-conditioning systems typically account for approximately 10% of the total energy consumed at the plant, with half of this energy consumed by the site's offices. In July 2002, the Kariya Plant installed a demand controlled device so that it could remotely and centrally manage the temperature settings on air-conditioning systems located throughout its offices. Previously, temperatures had been set according to individual preference.

To further reduce energy consumption, the Kariya Plant used a summer temperature setting that was one degree higher than the previous average summer temperature setting, as well as a winter setting that was one degree lower that the previous average winter temperature. A monitoring device was also installed at the transformer station in order to monitor and forecast the maximum electric power requirement. This data was used to ensure that the energy consumption from the plant's air-conditioning systems did not exceed the power contract with the electric company.

In the future, Toyota Industries will analyze the data from the use of a demand controlled device at the Kariya Plant in order to explore the possibility of installing similar devices at other plants.

Demand Controlled Device



Future Activities

In order to achieve further energy savings, Toyota Industries is committed to implementing the following activities during FY 2003: (1) improve the efficiency of air compressors; (2) adopt solar power generation and rooftop greening at the Obu Plant; and (3) reduce electric power loss during non-operation times.

In addition, Toyota Industries will further enhance its system for measuring energy consumption as well as aggressively work to conserve energy and reduce CO_2 emissions throughout its business activities.

*Returns: Excess casting material left over from casting processes.

Spotlight **Alternative Energy Sources and Greening Measures**

Environmentally Conscious Activities at e-Lab

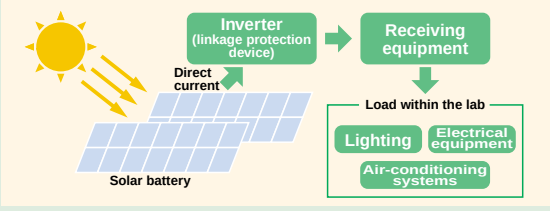
"e-Lab," Toyota Industries' IT research laboratory completed in May 2002, serves as a support organization for the information system division and as the company's R&D facility for information technology. The e-Lab was Toyota Industries' second facility to incorporate a solar power generation system after a similar system was installed at the Higashiura Plant. The power generated by the e-Lab's solar power generation system is used at the facilities.

The e-Lab has also taken steps to conduct greening around the perimeter of the facility and on the bridge that leads to its main entrance. An additional feature of the site is a rooftop garden. The greening efforts are designed to soften the transition between the e-Lab and its surroundings; these stem from the corporate philosophy of contributing to regional living conditions and social prosperity through corporate activities. The e-Lab's greening efforts recently led to the facility being awarded the 10th Aichi Townscape Architectural Award in January 2003, which is given to buildings that serve a major role in the community and contribute to an attractive and unique townscape.

e-Lab's employees also enjoy a working environment that is designed to be environmentally friendly. For example, the e-Lab provides special concentration rooms that are designed to allow employees to work without being disturbed by others, as well as various areas that foster communication between employees. In addition, the architectural layout utilizes a variety of areas that encourage e-Lab's employees to use the facility in different ways.

In August 2002, the e-Lab was awarded the Ministry of Economy, Trade and Industry's Ministerial Award as part of the 15th Nikkei New Office Awards for outstanding new office architecture.

Solar Power Generation System




e-Lab


Rooftop Garden

Affiliate Spotlight

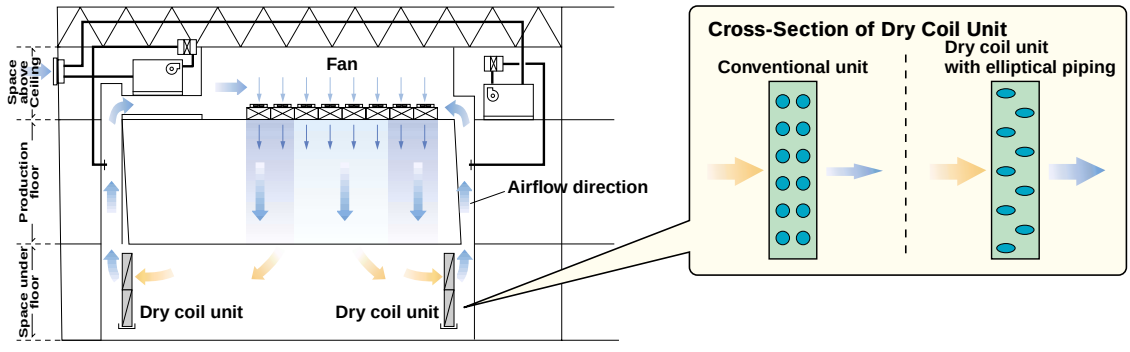
ST Liquid Crystal Display Corp. (ST-LCD) Adopts Environmentally Friendly Clean Room Ventilation System —Honored at the Outstanding Energy Conservation Equipment Awards

ST Liquid Crystal Display Corp. is a joint venture between Toyota Industries and Sony Corporation that manufactures liquid crystal displays (LCDs) used in personal digital assistants (PDAs) and video camcorders. In order to manufacture its LCDs, ST-LCD uses clean rooms that consume considerable amounts of energy. In an effort to reduce the energy consumption of its clean rooms, ST-LCD installed three thermal ice storage air-conditioning units and about 500 high-efficiency motors.

In February 2003, ST-LCD was awarded the Prize for Outstanding Performance as part of the Outstanding Energy Conservation Equipment Awards sponsored by the Japan Association of Refrigeration and Air-Conditioning Contractors (JARAC). The prize was awarded in recognition of the efficiency of ST-LCD's system for maintaining a constant clean room temperature and moisture level. ST-LCD's system uses elliptical piping rather than conventional round piping in the dry coil units that cool the warm air. The elliptical shape of the pipes results in less air resistance when forcing air through the pipes. Consequently, the circulation fans consume just 83.3 kW per hour, which equates to a reduction of 270 t-CO_2 of CO_2 emissions annually for the company.

ST-LCD will continue to manufacture LCDs of the highest quality while pursuing environmental activities.

Dry Coil Units Used in Clean Rooms



The heated air generated from the production floor passes through the dry coil units, where it is cooled and sent back to the production floor using fans.

Shiro Endo
Senior Managing Director
Chairman, Pollution Prevention Subcommittee

Pollution Prevention Subcommittee

The Pollution Prevention Subcommittee is dedicated to reducing the environmental impact of Toyota Industries' production activities and to maintaining an open dialogue with the local community.

Our main objective is to prevent pollution while managing and reducing the company's use of substances of concern. In recent years, we have seen the introduction of increasingly stringent regulations designed to protect the environment from the effects of the use of substances of concern. With the introduction of legislation such as Japan's PRTR Law and the European Union's end-of-life vehicle (ELV) directive, some products are even prohibited due to their inclusion of such substances.

There is still much that we need to learn about, such as the role of environmental endocrine disruptors in chemical substances. These and other issues serve to remind us of the need to be constantly vigilant about the chemical substances we use.

The Pollution Prevention Subcommittee is committed to further strengthening its efforts to prevent pollution through continued regulatory compliance and the implementation of voluntary measures. We will maintain a stance of full information disclosure and open dialog with the community, so that we may contribute to a sustainable society where humankind and nature can harmoniously co-exist.

Chemical Substance Management and Activities to Reduce Substances of Concern

Toyota Industries is making every effort to implement voluntary activities that are designed to prevent pollution and reduce harmful emissions by responding to the global need for chemical substance management.

● Medium Range Goals and Major Objectives

Toyota Industries' Third Environmental Action Plan sets a medium range goal of achieving a 50% reduction in total emissions of PRTR-designated substances and emissions per net sales of VOCs by FY 2005, compared with FY 1998 levels. The Action Plan also sets forth the major objectives described below.

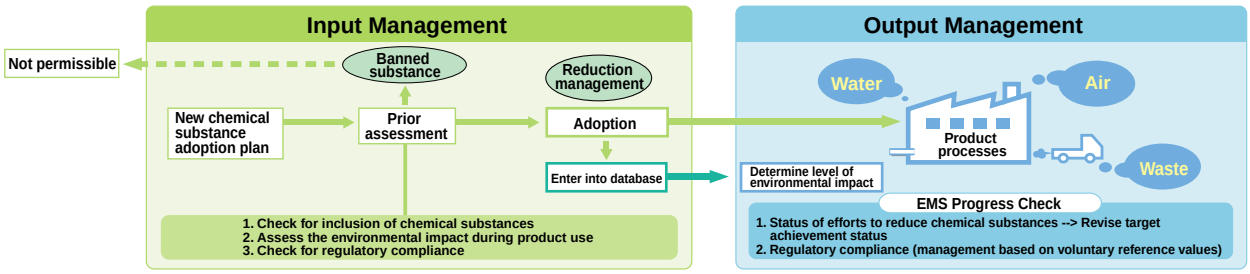
■ Comprehensive Management of Chemical Substances

Toyota Industries uses a prior assessment system to reduce its environmental impact and reduce various environmental risks. Risk management is practiced by comprehensively managing the adoption of new chemical substances. In addition, Toyota Industries has established its own voluntary control values governing the use of chemical substances, and is further enhancing its system for managing the company's regulatory compliance.

■ Reduce Emissions of Substances of Concern

Toyota Industries has singled out VOC emissions from painting processes as having a major impact on the environment. The company is taking steps to reduce VOC emissions by switching to powder coating and the use of water-soluble coatings. Furthermore, Toyota Industries has introduced equipment modifications such as installing VOC filters and thinner recovery equipment. The company has also improved its work procedures to further minimize VOC emissions as part of its overall effort to halve its VOC emissions.

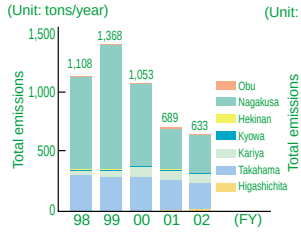
Chemical Substance Management Overview



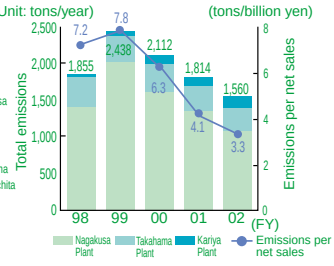
● FY 2002 Achievements

In FY 2002, Toyota Industries' emissions of PRTR-designated substances stood at 633 tons, while its VOC emissions stood at 3.3 tons per billion yen. As for PRTR-designated substances, the company did not achieve its FY 2002 target due to increased production at the Nagakusa and Kariya Plants (textile machinery plant). Compared with the previous fiscal year, Toyota Industries achieved an 8% decrease in PRTR-designated substances and a 20% decrease in VOC emissions as a result of switching to powder coating and of other efforts to reduce VOCs.

PRTR-Designated Substance Total Emissions

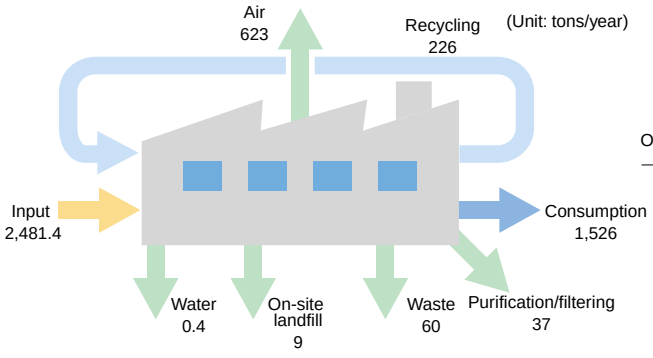


VOC Total Emissions and Emissions Per Net Sales



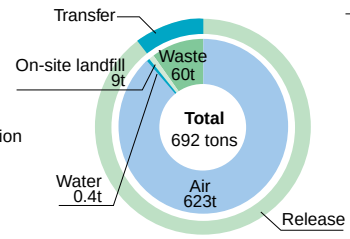
*Figures for VOC emissions per net sales are based on the total net sales from the three business units that emit VOCs.
*Data for compressor division are not included in that of Kariya Plant.

FY 2002 PRTR-Designated Substance Mass Balance

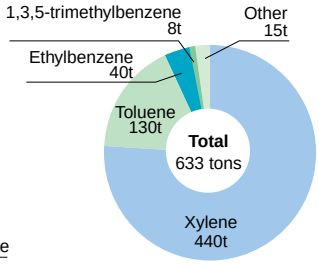


FY 2002 PRTR-Designated Substance Release and Transfer

■ Release and Transfer



■ PRTR Emissions by Substance



● FY 2002 Measures

Description	Measure	Plant
Change in paint materials	• Switch to powder coating	Takahama Plant See Case Study
Change in paint methods	• Switch to single coat application	Takahama Plant See Case Study
Ongoing improvements to work procedures	• Reduce coatings and thinner consumption • Improve thinner recovery rate • Switch from thinner cleaning to rag wiping for cleaning of painting machinery	Nagakusa Plant

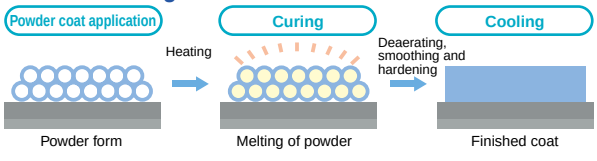
Case Study Activities at Takahama Plant

Annual VOC emissions reduction: 70 tons

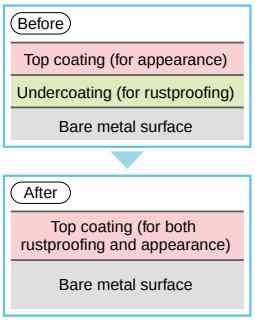
Powder coating involves electrostatically charging and applying a powder to a metal surface. The applied paint is then cured to produce an even coat application. Unlike conventional solvent-based coatings, powder coatings do not contain thinning agents and are therefore friendlier to the environment and safer to work with.

In January 2003, Toyota Industries' Takahama Plant switched to using powder coating in its painting process for forklift truck masts. The Takahama Plant had previously eliminated undercoating of forklift truck frames and weights in September 2002, as an initial step toward reducing emissions of substances of concern from its painting lines.

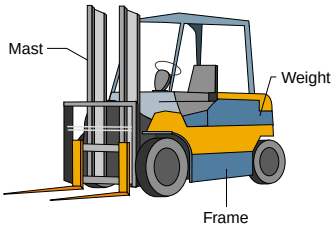
Powder Coating Process



Elimination of Undercoating



Forklift Truck Components



Future Activities

In FY 2003, the Kariya Plant (Textile Machinery Division) will adopt powder coating in its paint processes. The Nagakusa plant will switch to water-soluble coatings in order to further reduce its VOC emissions.

Subsidiary Spotlight

VOC Reduction Activities at Overseas Manufacturing Subsidiaries

European and American restrictions on VOC emissions are stricter than similar regulations in Japan, which directly affects Toyota Industries' subsidiaries in these regions.

Toyota Industries' overseas manufacturing-related subsidiaries include several firms that use relatively large-scale painting equipment, which cause VOC emissions. This group includes Toyota Industrial Equipment Mfg., Inc. (TIEM), Toyota Industrial Equipment, S.A. (TIESA) and BT Industries Group, which manufacture materials handling equipment. Michigan Automotive Compressor, Inc. (MACI) and Kirloskar Toyoda Textile Machinery Ltd. (KTTM) also use large-scale painting equipment at their facilities. All of these subsidiaries are gradually switching to new coating processes in an effort to reduce their VOC emissions.

Subsidiary	Paint Measures			Equipment Measures
	Thinner Reduction	Powder Coating	Water-Soluble Coating	
TIEM	○	○	—	○
MACI	—	—	—	○
TIESA	○	—	—	—
BT	○	○	○	—
KTTM	—	○	○	—

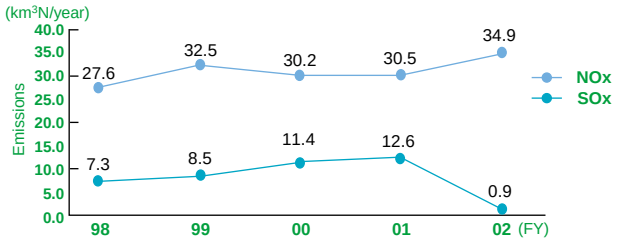
Pollution Prevention

Toyota Industries is striving to prevent pollution by identifying specific areas of environmental impact and establishing voluntary control values.

● Major Objectives

Toyota Industries is involved in efforts to reduce air pollution caused by pollutants such as nitrogen oxide (NOx), soot and sulfur oxide (SOx) produced by casting furnaces and boilers. The company's water quality management is focused on preventing water pollution and eutrophication* (nutrient pollution) caused by the discharge of plants' wastewater into nearby rivers. Toyota Industries is also working to reduce foul odors by reducing its VOC emissions, which are known to release these odors. The company is conducting noise prevention measures by identifying sources of noise and either adopting new equipment or improving existing equipment to reduce noise levels.

SOx and NOx Emissions



COD, Nitrogen and Phosphorous in Wastewater

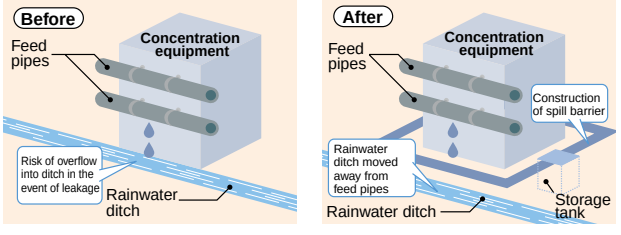
● FY 2002 Pollution Prevention Measures

Type	Measure	Plant	
Air quality management	Reduce SOx be decreasing coke use	Higashichita Plant	See p.28
Water quality management	Prevent water pollution by installing a spill barrier	Hekinan Plant	See Case Study A
Foul odor prevention	Reduce VOC emissions by switching to powder coating	Takahama Plant	See p.31
Noise prevention	Install sound-proofing enclosures	Obu Plant	See Case Study B

Case Study A Pollution Prevention Measures at Hekinan Plant

Toyota Industries' Hekinan Plant recently constructed a spill barrier around its concentration equipment used to process water-soluble cutting fluids. The purification equipment was located adjacent to a rainwater ditch, with the feed pipes positioned over the ditch. The spill barrier is designed to prevent overflow into the ditch and subsequent water pollution in case of an equipment leak.

Pollution Prevention Measures at Hekinan Plant



Case Study B Noise Prevention Measures at Obu Plant

Toyota Industries' Obu Plant was fully compliant with regulatory noise level standards before the plant decided on voluntary measures to further limit noise from the plant. The plant installed sound-proofing enclosures for equipment which generated noise.

Cooling Tower With Sound-proofing Enclosure

Future Activities

Toyota Industries has established its own procedures governing pollutants that are regulated under the Water Pollution Control Law. The company has created its own set of voluntary control values for water pollutants, which are stricter than regulatory values. Toyota Industries has also laid out appropriate countermeasures to be implemented in the event that voluntary control values are exceeded. In the future, Toyota Industries will seek to further enhance its management system for pollutants and will take additional steps to reduce air pollution, noise pollution and industrial vibration. During FY 2003, the company will establish specific control values to deal with air pollution, noise pollution and industrial vibration levels.

Reducing Use of HFCs

Toyota Industries is involved in various activities to collect hydrofluorocarbons (HFCs), substances that have been identified as contributing to global warming.

● Major Objectives

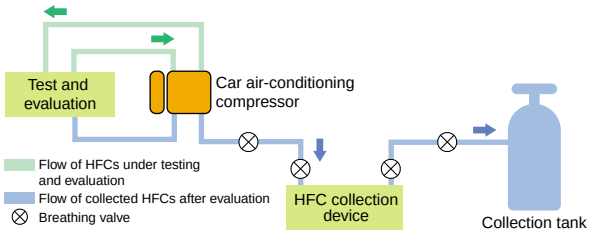
Toyota Industries currently uses HFC-134a refrigerant in its automobile assembly processes and car air-conditioning compressors. HFC-134a was introduced as an alternative to CFC-12, a substance that damages the earth's ozone layer. However, HFC-134a has been identified as contributing to global warming. The company uses HFC recovery equipment at its plants to decrease its emissions of HFC-134a.

*For detailed HFC-134a emission levels, see p.44.

● FY 2002 Activities

In FY 2002, Toyota Industries installed additional HFC collection devices at its Kariya Plant. The new devices are smaller than previous devices used for such recovery.

Recovery of HFCs

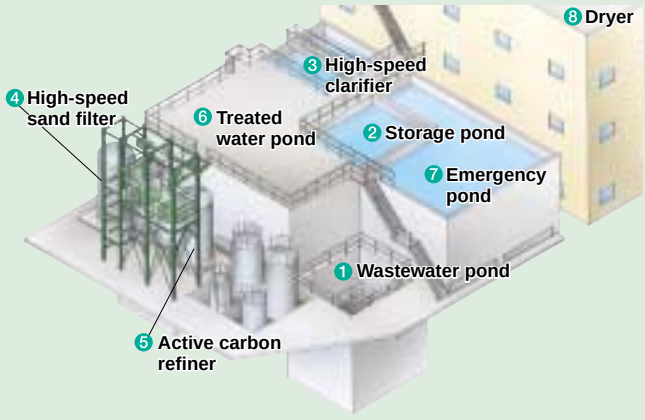


*Eutrophication: Release of substances containing nitrogen and phosphorous into lakes and rivers from household wastewater and industrial wastewater, leading to the multiplication of plankton and microbes that affect water quality.

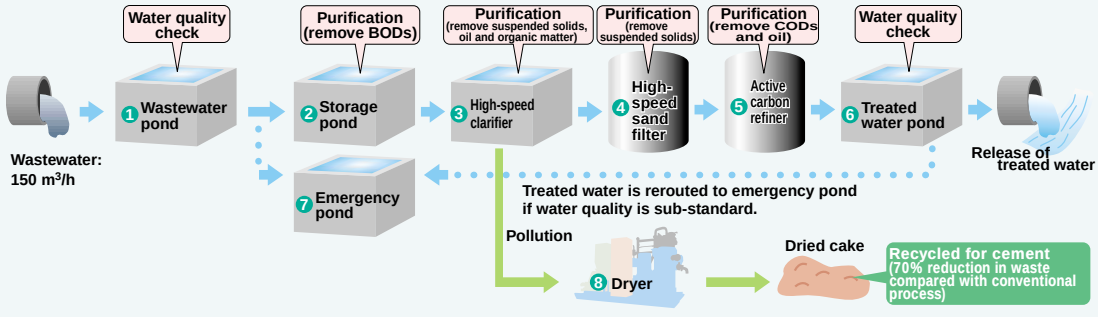
Spotlight **Environmental Activities at the Wastewater Treatment Facility of Kariya Plant**

Environmentally Conscious Wastewater Treatment Facility To Minimize Environmental Risks

Toyota Industries uses its own wastewater treatment facilities to treat wastewater produced during manufacturing, before releasing the purified water into rivers and oceans. In FY 2003, Toyota Industries will upgrade the wastewater treatment facility at its Kariya Plant to incorporate a variety of measures designed to conserve energy, reduce industrial waste and minimize environmental risks.



Wastewater Treatment Process



Energy Conservation Measures

- Use high efficiency motors and air valves
- Use excess plant steam capacity for drying process

➡ **10% reduction in energy consumption**

Waste Reduction Measures

- Improve drying efficiency for sludge resulting from wastewater treatment

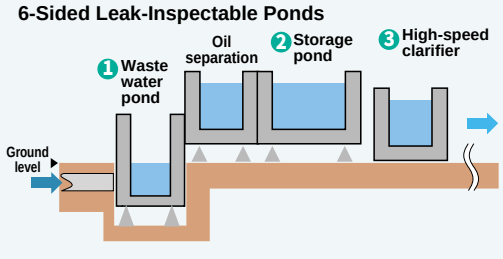
➡ **70% reduction in sludge**
Sludge recycled as cement

Environmental Risk Management

1. Leak Prevention Measures

Installation of 6-sided leak-inspectable ponds to help prevent leakage of wastewater.

6-Sided Leak-Inspectable Ponds

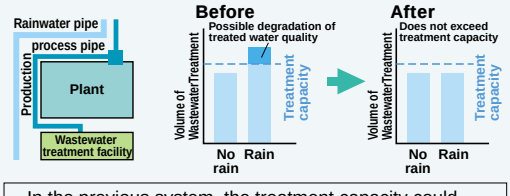


Each pond is constructed so that it can be inspected from all six sides including the bottom, in order to detect leaking and prevent below-ground release of wastewater.

2. Separation of Rainwater and Wastewater

Rainwater and wastewater are kept completely separate for optimal treatment efficiency.

Treatment Capacity



In the previous system, the treatment capacity could have been exceeded during heavy rains, which might have affected the treated water quality. Separating the rainwater from the wastewater enables the facility to maintain the treated water quality at a high level.

3. Installation of Emergency Water Tank Prevents Release of Sub-Standard Water

By installing water quality measurement devices in storage ponds, treated water can be diverted to emergency ponds in case of sub-standard water quality, thereby preventing the release of sub-standard water.

Shinjiro Kamimura
Senior Managing Director
Chairman, Resource Utilization Subcommittee

Resource Utilization Subcommittee

The Resource Utilization Subcommittee is dedicated to reducing Toyota Industries' impact on the environment through improved technologies that help the company to better utilize limited resources.

The Subcommittee is guided by a commitment to contributing to a sustainable society through efficient resource utilization, and to reducing the environmental impact of its logistics operations.

The Subcommittee has until now focused on efforts to encourage reuse as an important first step towards better resource utilization. In the future, the Subcommittee will focus its efforts on conserving our resources through reduced consumption, which we believe will help Toyota Industries to reduce costs and strengthen the company by creating new business opportunities.

We will continue to aggressively work to solve the challenge of better resource utilization by pursuing solutions from all possible perspectives.

Reducing Industrial Waste

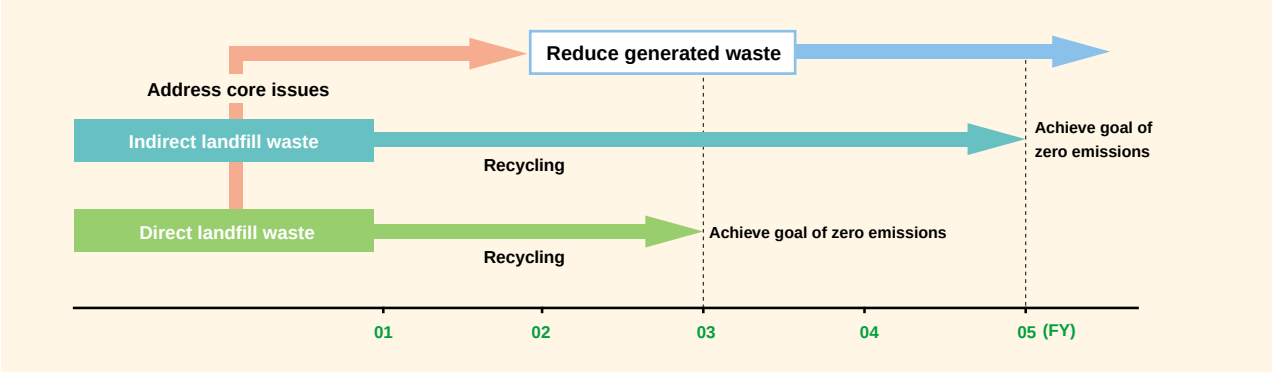
Toyota Industries is committed to achieving its goal of zero emissions of direct landfill waste by FY 2003.

● Medium Range Goals and Major Objectives

To contribute to the building of a sustainable society, Toyota Industries is committed to maximizing recycling of resources and further reducing generated waste.*1

Toyota Industries' Third Environmental Action Plan sets a medium range goal of achieving zero emissions*2 of direct landfill waste*3 by FY 2003. The company is making every effort to achieve this goal in the next fiscal year. The Third Environmental Action Plan also sets a goal of achieving zero emissions of indirect landfill waste*4 by FY 2005, which the company is pursuing through various measures aimed at the recycling of resources. However, Toyota Industries recognizes that recycling itself causes an environmental impact, and is working towards reducing generation of industrial waste.

Medium Range Plan for Reducing Industrial Waste Generated



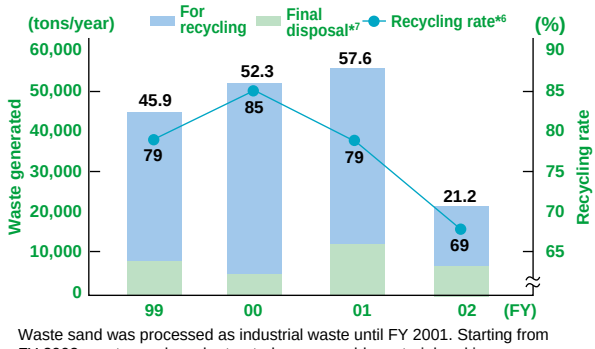
● FY 2002 Achievements

For FY 2002, Toyota Industries set annual goals of reducing its direct landfill waste from 10,187 tons to 7,000 tons and its indirect landfill waste from 1,687 tons to 1,154 tons.

In FY 2002, the company generated total waste of 96,692 tons including all forms of waste such as industrial waste, non-industrial waste and reusable materials. Industrial waste accounted for 21,184 tons, of which liability recycling waste*5 totaled 14,535 tons, which is equivalent to a recycling rate*6 of 69%. Direct landfill waste and indirect landfill waste totaled 6,175 tons and 474 tons respectively, which met the short term goals set for FY 2002. Non-industrial waste output came to 1,821 tons at a recycling rate of 93%, which was a 10% improvement over FY 2001 levels.

*For definitions of "industrial waste" and "zero emissions," see the bottom of p.55.

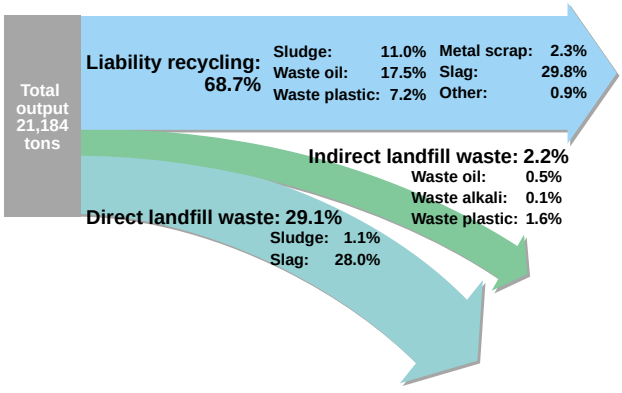
Industrial Waste



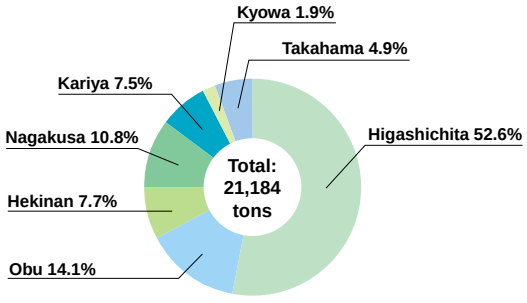
Waste sand was processed as industrial waste until FY 2001. Starting from FY 2002, waste sand can be treated as a reusable material and is no longer counted as industrial waste. Waste sand generation amounted to roughly 24,000 tons in FY 2002.

*1 Generated waste: The total of landfill waste, industrial waste, municipal waste, reusable materials, and liability recycling waste.
*2 Zero emissions of landfill waste: Defined by Toyota Industries as a 95% or greater reduction in direct landfill waste compared with FY 1998 levels, and a 95% or greater reduction in indirect landfill waste compared with FY 1999 levels.
*3 Direct landfill waste: Industrial waste that is directly disposed in landfills without intermediate treatment such as crushing or incineration.
*4 Indirect landfill waste: Industrial waste that is subjected to intermediate processing such as crushing or incineration before being disposed in landfills.
*5 Liability recycling waste: Waste materials that are recycled for a fee.
*6 Recycling rate: Ratio of industrial waste that is recycled by means of liability recycling.
*7 Final disposal: Total of direct and indirect landfill waste.

FY 2002 Industrial Waste by Type and Treatment Process



FY 2002 Industrial Waste by Plant



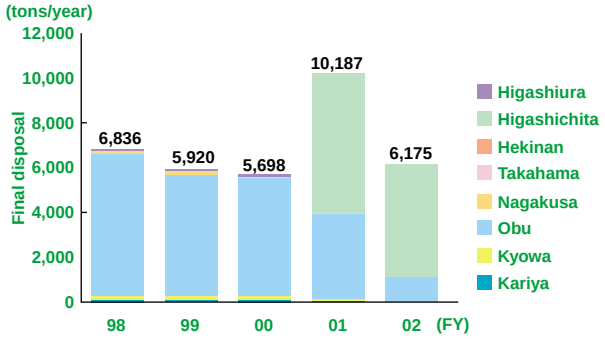
● FY 2002 Measures

■ Eliminating Direct Landfill Waste

Toyota Industries achieved its goal of zero emissions of direct landfill waste at its Nagakusa Plant in FY 2000, and later at its Kariya Plant, Kyowa Plant, Takahama Plant and Hekinan Plant in FY 2001. The Higashichita Plant and Obu Plant are currently implementing various measures in order to achieve the goal of zero emissions by FY 2003.

Measure	Plant
• Improve system for slag separation • Implement easier method for loading ultra fine powders on trucks • Install aluminum separators	Higashichita Plant
• Decommission older wastewater treatment facilities which contribute to sludge dewatering pollution	Obu Plant

Direct Landfill Waste by Plant

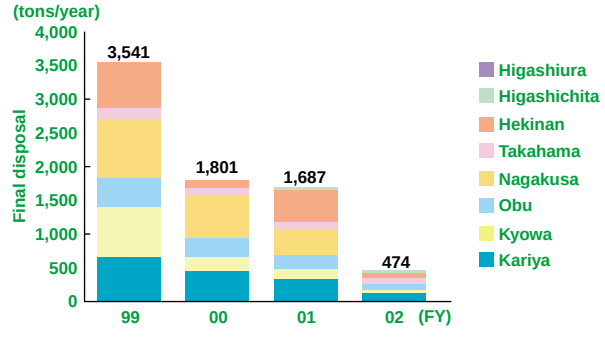


■ Eliminating Indirect Landfill Waste

Toyota Industries' Nagakusa Plant achieved its goal of zero emissions of indirect landfill waste in FY 2001. The company's other plants are involved in ongoing efforts to achieve zero emissions of indirect landfill waste through measures such as implementing better waste separation and conducting recycling of waste incinerated by third-party companies. As a result of these efforts, the Kariya Plant and Kyowa Plant successfully achieved the goal of zero emissions of indirect landfill waste in FY 2002. The company's remaining plants are working to achieve the goal of zero emissions prior to the FY 2005 target date.

Description	Measure	Plant
Implement recycling after intermediate processing by third-party company	•Recycle waste plastic •Recycle grinding sludge •Recycle protective equipment used by workers	All plants
Increase recycling ratio by improving separation practices	•Create quick reference chart for resource separation •Implement waste patrols •Set up zero emission information corners	

Indirect Landfill Waste by Plant



■ Reducing Industrial Waste

Case Study Activities to Reduce Industrial Waste at Hekinan Plant (Annual waste oil reduction: 31 tons)

Toyota Industries' Hekinan Plant consumes hydraulic oil for its manufacturing equipment. The hydraulic oil must be replaced when it becomes contaminated with water and other impurities. Until recently, the plant had been sending the resulting waste oil to a recycling company for processing. However, the Hekinan Plant recently installed separators to recover hydraulic oil from the waste oil and remove any impurities, which enables the plant to successfully reuse the recycled oil.

Future Activities

Toyota Industries will work to achieve the goal of zero emissions of direct landfill waste at all plants by FY 2003, which will be accomplished by achieving zero emissions at its Obu Plant and Higashichita Plant. The company also plans to achieve zero emissions of indirect landfill waste at its Hekinan Plant and Takahama Plant in FY 2003.

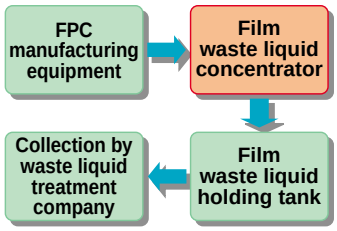
Subsidiary Spotlight

TIBC Corporation

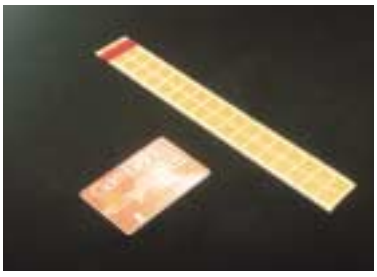
Activities to Reduce Industrial Waste

TIBC Corporation, a joint venture between Toyota Industries and Ibiden Co., Ltd., manufactures semiconductor package substrates. The company's manufacturing processes require the use of strong acids and strong alkalis, which results in significant output of waste liquid that must be treated as special industrial waste.

TIBC has set a goal of achieving a 50% reduction in its output of strong alkalis by FY 2005 and is implementing various measures to achieve this goal. For example, in August 2002, TIBC installed a waste liquid concentrator for its flexible printed circuit (FPC)* substrate manufacturing line that successfully reduced the generation of strong alkalis by 50%. In FY 2003, the company will construct a neutralization processing facility that will further reduce strong alkali generation when combined with the company's existing waste liquid concentrator.




Film waste liquid concentrator


IC Card (left) and FPC substrate

Tokaiseiki Co., Ltd.

New Concentration System Helps to Reduce Mold Release Agent Consumption

Tokaiseiki Co., Ltd. manufactures aluminum die-cast parts for car air-conditioning compressors. Previously, the company used wastewater treatment facilities to treat wastewater produced by its manufacturing processes. However, due to the facility's proximity to nearby residential neighbor-hoods and schools, the company decided to decommission the wastewater treatment facility for risk management purposes. In FY 2000, Tokaiseiki installed a new waste oil concentrator that helped the company to drastically reduce the amount of waste oil, which had previously been treated together with wastewater. Consequently, the company reduced waste oil generated from mold release agents and other sources by over 90%, resulting in a decrease from 6,000 tons to just 625 tons in FY 2001. Tokaiseiki also reduced generated industrial waste by 16% in FY 2002 compared with the previous fiscal year.


New Concentration System

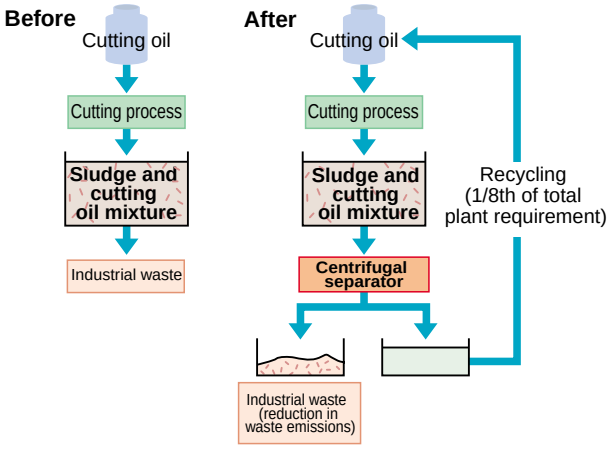
Nishina Industrial Co., Ltd.

Recycling Industrial Waste

Nishina Industrial Co., Ltd. manufactures hydraulic valves and other parts used in industrial equipment such as forklift trucks. In January 2002, the company acquired ISO 14001 certification, which led to a renewed emphasis on promoting environmental activities as a way of improving the company's management quality. Nishina's efforts are focused on conserving energy and reducing industrial waste emissions.

Nishina generates large quantities of cutting sludge as a byproduct of its machining operations for parts. Previously, the company had disposed of the cutting sludge, a mixture of cutting oil and sludge, as industrial waste. Starting from FY 2002, Nishina began separating the cutting oil from the cutting sludge mixture using a centrifugal separator, and then reusing the separated oil. Consequently, the company was able to reuse 0.5 tons of cutting oil every month, which is equivalent to 1/8th of its monthly cutting oil needs.

Cutting Oil Recycling



*Flexible Printed Circuit (FPC): Used in manufacturing IC cards.

Reducing Water Consumption

Toyota Industries is taking aggressive steps to reduce its water consumption through efforts such as the elimination of car washing processes and the utilization of rainwater.

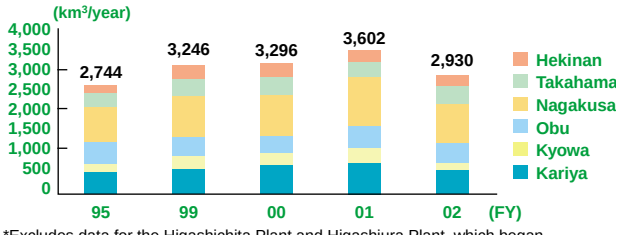
● Medium Range Goals and Major Objectives

Toyota Industries is implementing measures to reduce its water consumption in order to conserve water resources and reduce the environmental impact of plant wastewater. The company's Third Environmental Action Plan sets a medium range goal of achieving a 20% reduction in water consumption in its vehicle manufacturing by FY 2005 (compared with FY 1995 levels), as measured on a volume per vehicle basis. As part of its major objectives, Toyota Industries is committed to both conserving and reusing water resources.

● FY 2002 Achievements

In FY 2002, Toyota Industries focused on achieving its short term goal of reducing the company's water consumption to 3,258 km³. The company's total water consumption in FY 2002 was 2,930 km³, which equates to a 19% decrease in water consumption from the previous fiscal year.

Water Consumption



*Excludes data for the Higashichita Plant and Higashiura Plant, which began operations in FY 2001 and FY 2002, respectively.

● FY 2002 Measures

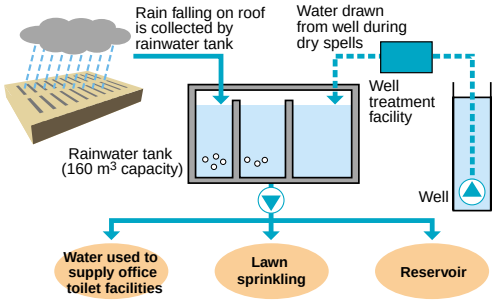
Description	Measure	Plant
Identify and reduce waste	• Identify water leakage points	All plants
	• Implement patrols for processes that use water	Nagakusa Plant
Improve processes	• Reduce water consumption from plating processes	Kariya Plant
	• Eliminate car washing processes	Nagakusa Plant See p.28
Conserve and reuse	• Convert wastewater for use in cooling towers	Hekinan Plant
	• Utilize rainwater for lawn sprinkling	Higashiura Plant See Case Study

Case Study Water Conservation Activities at Nagakusa Plant and Higashiura Plant

Toyota Industries' Nagakusa Plant has successfully eliminated a car washing process that had previously been conducted after the intermediate coating process during painting. This change reduced the plant's water consumption by 272 liters per vehicle. (For more information, see p.28.)

At Toyota Industries' Higashiura Plant, which began operating in July 2002, a 160 m³ capacity rainwater tank has been installed. Water from this tank is used to supply toilet facilities and provide water used for lawn sprinkling.

Rainwater Utilization System at Higashiura Plant



Future Activities

Toyota Industries has established a short-term goal of reducing its water consumption by 3% during FY 2003.

Subsidiary Spotlight

Water Conservation Efforts at Overseas Manufacturing-related Subsidiaries

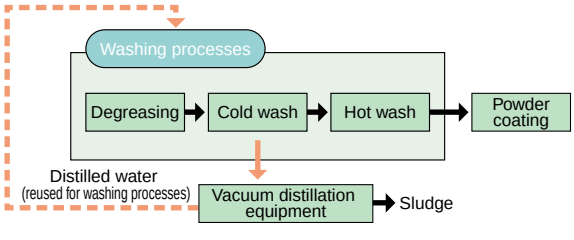
Activities to Promote Water Conservation in Sweden and India

Water is treated as an extremely valuable resource outside Japan, where it is common to collect rainwater for use in lawn sprinkling and other purposes. There is also an increasing emphasis on reusing wastewater resulting from production activities.

BT Industries is located in Sweden and is involved in a variety of activities to conserve water. For example, the company has installed vacuum distillation equipment to purify wastewater used in washing processes. The vacuum distillation equipment enables the company to separate the water and sludge in the wastewater, so that the resulting distilled water can be reused in washing processes.

At Kirloskar Toyoda Textile Machinery Ltd., wastewater from plating processes is reused after being purified in a wastewater treatment facility and an ion-exchange resin process.

Water Conservation at BT Industries



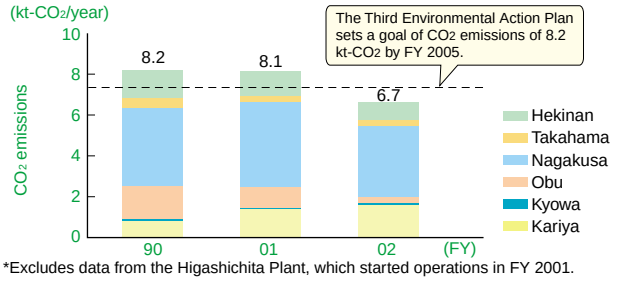
Reducing CO_2 Emissions from Logistics Operations

Toyota Industries is making various efforts to increase the efficiency of its logistics operations, including switching to rail transport and sharing its truck capacity.

● Medium Range Goals and Major Objectives

Toyota Industries recognizes that its transport activities have an impact on the environment as a result of CO_2 emissions and other factors. The company's Third Environmental Action Plan sets a medium range goal of achieving CO_2 emissions equivalent to FY 1990 levels by FY 2005. The company's major objectives are to increase the efficiency of its existing transportation activities and switch to alternative transportation methods.

CO_2 Emissions from Logistics Operations



*Excludes data from the Higashichita Plant, which started operations in FY 2001.

● FY 2002 Achievements

For FY 2002, Toyota Industries established a short term goal of reducing its total CO_2 emission levels by 10% compared with the previous fiscal year. In FY 2002, the company successfully limited its total CO_2 emissions to 6.7 kt-CO_2. Toyota Industries achieved this short term goal by improving its load efficiency and rescheduling its truck shipments to reduce the overall number of trips required.

● FY 2002 Measures

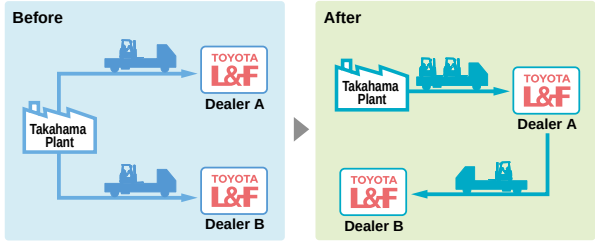
Description	Measure	Plant
Improve transportation efficiency	• Improve loading efficiency • Improve transportation routes (Case Studies A and C)	All plants
Change transportation method	• Switch from ship to rail transport (Case Study B)	Takahama Plant

Case Study A Reducing Truck Shipments

Toyota Industries' Takahama Plant ships its completed forklift trucks to its regional dealers by truck and to its long-distance dealers by truck or ship. Previously, the Takahama Plant had been using separate truck shipments for each dealer. In FY 2001, the plant established fixed truck routes so that forklift truck shipments could be delivered to several dealers at one time. This helped to reduce the plant's overall truck shipments.

In FY 2002, the Takahama Plant created additional route variations, bringing the total of fixed truck routes to around 50. Consequently, the plant was able to reduce its CO_2 emissions by 241 t-CO_2 in FY 2002.

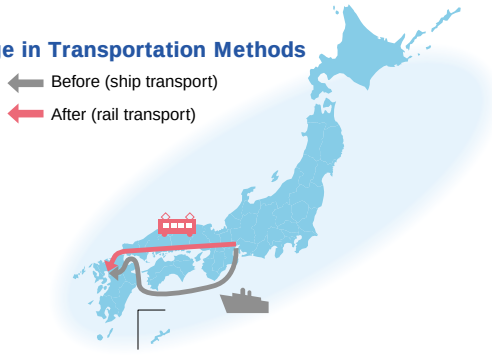
Truck Routes



Case Study B Utilizing Alternative Transportation Methods

In February 2003, Toyota Industries began switching to alternative means of transport for its long distance forklift shipments in Japan. This pilot program involved switching from ship to rail transport over an area that currently stretches from Aichi Prefecture to Kyushu (over 2,500 km). Toyota Industries expects that this pilot program will reduce its CO_2 emissions by 96 kg-CO_2 per delivery and is planning to switch to rail transport for future shipments to Hokkaido.

Change in Transportation Methods

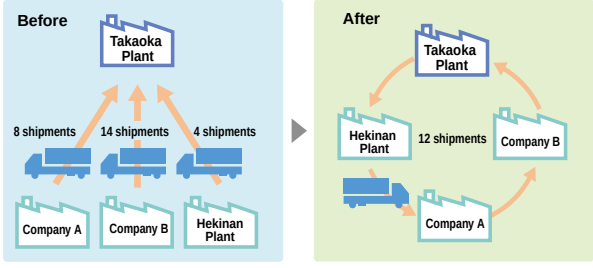


Case Study C Sharing Truck Shipments to Toyota Motor Corporation

Toyota Industries is attempting to optimize the efficiency of its deliveries to Toyota Motor Corporation's Takaoka Plant. Previously, Hekinan Plant had been scheduling its own independent deliveries to the Takaoka Plant. In November 2002, the Hekinan Plant began deliveries of combined shipments to the Takaoka Plant that included cargo from other companies. Consequently, the frequency of deliveries to the Takaoka Plant was reduced, which led to a concrete reduction in CO_2 emissions.

The Hekinan Plant is also in the process of similarly optimizing its deliveries to other plants owned by Toyota Motor Corporation. These changes are expected to result in a further reduction of 1.9 t-CO_2 in CO_2 emissions per month.

Optimized Deliveries to Takaoka Plant



Future Activities

In FY 2003, Toyota Industries will further reduce its CO_2 emissions by optimizing its transport activities through the initiatives shown above and by switching to alternative transportation methods.

Subsidiary Spotlight

Taikoh Transportation Co., Ltd.

Activities to Improve Logistics Efficiency

Taikoh Transportation Co., Ltd. is engaged in various efforts to prevent global warming by improving the efficiency of its logistics operations. The company has set a medium range goal of achieving a 6% improvement in the fuel economy of its transport fleet by FY 2006, compared with FY 2001 levels. As of FY 2002, Taikoh Transportation had already achieved a 3% improvement in the fuel economy of its fleet, which surpassed its 2% target for FY 2002.

As part of its efforts to improve the fuel economy of its fleet, the company has adopted "Digital Tachograph" driving assistance systems for its vehicles. The software-based system warns drivers when fuel is not being used optimally. Due to their effectiveness, the company has increased its rate of adoption for these systems, which are now installed in 61% of the company's fleet or 380 vehicles. Taikoh Transportation is also experimenting with other changes designed to improve its load efficiency and route efficiency.

"Digital Tachograph" Driving Assistance System

Reducing Packaging

Toyota Industries is taking a variety of steps to reduce packaging throughout the company, including the development of reusable packaging methods.

● Medium Range Goals and Major Objectives

Toyota Industries is reducing its packaging consumption used in the transport of products and parts destined for Japan and overseas. The company's Third Environmental Action Plan sets a goal of achieving a 20% reduction in packaging consumption by FY 2005, compared with FY 1995 levels. Toyota Industries is achieving this goal by constantly making small improvements using the Toyota Production System, which was originally formulated by Toyota Motor Corporation.

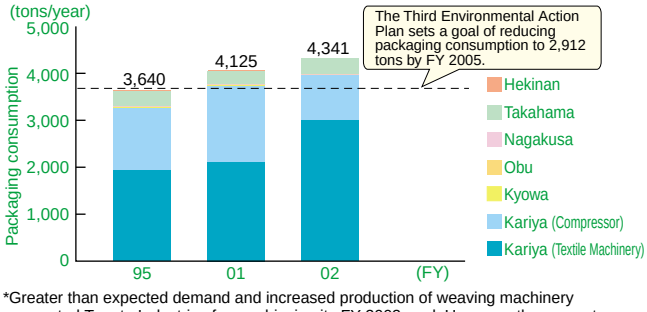
● FY 2002 Measures

Description	Measure	Plant
Change packaging method	• Switch from wood crates to reinforced cardboard boxes • Reduce packaging material consumption by modifying loading method for parts	Kariya Plant (Textile Machinery Division)
	• Switch to returnable packaging container	Takahama Plant Case Study (Toyota Material Handling Company)
Improve packaging method	• Reduce materials used in pallets	Kariya Plant (Textile Machinery Division)
	• Switch from cushioning materials to materials made from wood thinnings	Takahama Plant (Toyota Material Handling Company)

● FY 2002 Achievements

In FY 2002, Toyota Industries set a goal of achieving a 10% reduction in packaging consumption compared with the previous fiscal year. The company was unable to meet this objective due to extrinsic factors such as increased production of textile machinery. However, the company reduced its packaging consumption by 49% compared with FY 2001 levels, when measured on a production unit basis.

Packaging Consumption



*Greater than expected demand and increased production of weaving machinery prevented Toyota Industries from achieving its FY 2002 goal. However, the amount of packaging consumed per weaving machine produced decreased from 0.63 tons in FY 2001 to 0.31 tons per machine in FY 2002, a decrease of over 50%.
*Excludes data from the Higashichita Plant and Higashiura Plant, which started operations in FY 2001 and FY 2002, respectively.

Case Study Adoption of Returnable Packaging Containers

Annual packaging consumption reduction: 18 tons

As part of its operations, Toyota Industries' Takahama Plant distributes forklift truck parts to dealers in Japan and overseas. Previously, the Takahama Plant had been using cardboard packaging for its forklift truck parts used in Japan, which required excess packing in the form of cushioning materials to protect parts from external forces and wrapping to prevent stacks of boxes from tipping over.

In order to reduce its use of packaging materials, the Takahama Plant began to use returnable packaging containers to transport its forklift truck parts. Consequently, the Takahama Plant reduced its annual purchases of packaging, cushioning materials and wrapping products by 18 tons. The plant is gradually expanding use of its returnable packaging container, which is currently being used by 14 dealers and in 138 locations, primarily in the Chubu region of Japan.

Conventional Cardboard Boxes

New Returnable Packaging Containers

New Collapsible Returnable Packaging Containers

Future Activities

In FY 2003, Toyota Industries will continue its efforts to reduce its use of packaging. Measures will include switching from wood to cardboard packaging, expanding its program of using returnable packaging containers in Japan and continued efforts to reuse cardboard packaging.

Working with the Community

Toyota Industries is committed to working closely with local communities as a good corporate citizen, and is making every effort to practice information disclosure.

Guiding Principles for Corporate Citizenship

● Basic Philosophy

Toyota Industries is respectful of the people, culture, and traditions of each region and country in which it operates. It also works to promote economic growth and prosperity in those countries.

● Basic Perspective

While aiming toward corporate development and longevity, Toyota Industries strives to fulfill its role as a good corporate citizen so that the regions which provide a foundation for its corporate activities and its employees' lifestyles become more prosperous and pleasant. To accomplish this, Toyota Industries actively promotes cooperative support activities with the objective of contributing to society through the provision of human resources, facilities, and funds. Toyota Industries' employees, through activities such as volunteering, also endeavor to be of service to society.

● Community Dialog and Contributions to the Local Community in Japan

■ Meeting with Members of the Community

Toyota Industries holds regular meetings with members of the local community in order to provide information about the company's activities. These meetings are also used to relay up-to-date information about the company's approach to risk management and environmental conservation activities, including its efforts to reduce substances of concern and industrial waste.

In FY 2002, Toyota Industries held ten meetings with members of various local communities. By providing an opportunity for open dialog between Toyota Industries and local communities, local residents have been able to voice their opinions about the company and its activities, which has led to the implementation of new environmental efforts by the company.

Community Dialog Meeting Sponsored by Seven Firms Belonging to the Toyota Group

■ Commencement of Operations at Higashiura Plant

Toyota Industries' Higashiura Plant began operations in July 2002. The Higashiura Plant was constructed based on the concept of harnessing natural energy sources to achieve harmony with the surrounding environment. The plant uses a clean energy system that makes use of alternative energy sources such as solar power generation and wind power generation. Other environmental considerations include the extensive use of greenspace, which covers 47.8% of the site. The Higashi-ura Plant was specifically designed to showcase the possibilities of an environmentally friendly plant and is involved in ongoing efforts to increase awareness of the plant's environmental efforts in the local community and among other corporations it does business with.

Information Board Describing Environmentally Friendly Features of Higashiura Plant

Site View of Higashiura Plant

■ Environmental PR Activities at Community Events

In October 2002, Toyota Industries participated in the Environmental Festa in Obu 2002 event, which was held in Obu City, Aichi Prefecture. The company was represented by the Nagakusa Plant, Kyowa Plant and Obu Plant, all of which are located in Obu City.

At this event, Toyota Industries provided information about environmental activities being implemented throughout the company, as well as information about specific plant efforts such as zero emissions measures at the Nagakusa Plant. Products such as panels and recycled products were exhibited.

Distributing Samples of Natural Compost from the Obu Plant and Kyowa Plant (Environmental Festa in Obu 2002)

■ Volunteer Clean-Up Activities

Each of Toyota Industries' plants has established regular clean-up events where company employees volunteer their time to clean up areas around the plants where they work. In addition, Toyota Industries held a company-wide clean-up event on August 10, 2002, which was attended by approximately 1,400 employees. In FY 2002, Toyota Industries' plants held ten clean-up events with the participation of approximately 1,730 employees. After collecting the garbage, the volunteers took the time to separate the waste, which helped to stress the importance of waste separation among the company's employees.

Employees at Clean-up Event

Subsidiary Spotlight

Kirloskar Toyoda Textile Machinery Ltd.

Working in Harmony with the Local Environment

Kirloskar Toyoda Textile Machinery Ltd. is located in Kirloskar, India. The company's facilities are situated in a rural environment including a national park that is a habitat for the endangered Indian elephant. In line with the environmental sensitivity of its location, the company has made a strong effort to promote activities based in harmony with nature. These activities include aggressive efforts to plant trees and to expand the use of greenspace within the company's facilities. The company has also used a portion of the plant's 2,000 m² greenspace area to plant enough mango trees to provide fruit for all of the company's 200 employees.

Mango Orchard on Grounds of Kirloskar Toyoda Textile Machinery Ltd.

●PR Activities and Outside Recognition

■ Web Site and Environmental PR Advertisements

Toyota Industries is using the Internet and environmental PR advertisements to communicate its environmental conservation efforts to the public. The company's environmental Web site was launched in April 2002 and is regularly updated to provide useful, timely information.

In addition, Toyota Industries took out an advertisement in the April 2003 edition of the *Nikkei Ecology* publication that described the company's group-wide environmental management system and its environmental conservation activities.

Environmental Web Site
www.toyota-industries.com/environment

Nikkei Ecology
(April 2003 Edition)

■ Assessment by Rating Institute for Sustainable Management

The Rating Institute for Sustainable Management is a non-profit organization that assesses the social contribution of corporations from the perspective of creating a sustainable society. Toyota Industries recently participated in a preliminary survey conducted by the Rating Institute for Sustainable Management that was designed to rate the sustainable management of various firms. The survey covered three major areas of sustainable management including corporate philosophy, environmental activities and corporate ethics.

On February 26, 2003, the Rating Institute for Sustainable Management announced that Toyota Industries was one of 72 leading eco-friendly corporations in its survey. In addition to highlighting the company's achievements, the survey also helped Toyota Industries to identify areas of its sustainable management that could be improved so that the company can continue to be a leader in the field of sustainable management.

■ Donations to Environmental and Nature Conservation Efforts

In FY 2002, Toyota Industries made financial contributions to three organizations, including contributions to the Keidanren Nature Conservation Fund and to beautification efforts directed at the Meiji Agricultural Irrigation Infrastructure in Kariya City, Aichi Prefecture.

Spotlights

Exhibition of Environmentally Conscious Products at Tokyo Motor Show 2002

In FY 2002, Toyota Industries participated in the commercial vehicles exposition at the 36th Tokyo Motor Show 2002, which was held from October 29 to November 3 at the Makuhari Messe in Chiba Prefecture. The company's booth provided technical information about the company's electrically driven car air-conditioning CO_2 compressor and other environmentally conscious products.

Toyota Industries Booth at Tokyo Motor Show 2002

1st Japan Sustainable Management Award

On March 14, 2003, Toyota Industries was awarded the Excellent Sustainable Management Award by the Japan Sustainable Management Award Committee, which is chaired by Professor Ryoichi Yamamoto of the University of Tokyo.

The Japan Sustainable Management Awards are designed to honor firms that have an outstanding track record in their efforts to promote environmental management that is harmonious with both the environment and economic vitality. The awards include the Sustainable Management Pearl Award grand prize and five Excellent Sustainable Management Awards. Toyota Industries received the latter prize in recognition of its environmental management activities at the Kariya Plant, which include the development of a CO_2 compressor and its track record in maintaining an open dialog with the local community. The receipt of this award will serve as a further impetus for Toyota Industries to promote sustainable management practices throughout the company.

1st Japan Sustainable Management Awards Ceremony

Safety and Health Management

Toyota Industries is dedicated to a proactive approach to safety and health management, and to providing a safe and healthy workplace environment for all employees.

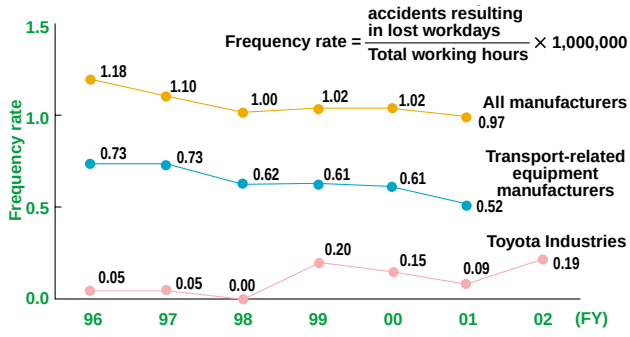
Each employee of Toyota Industries is a valuable asset to the company, and the company takes seriously its responsibility to ensure the safety and health of all its employees. Toyota Industries is aggressively carrying out measures that are designed to provide a safe, pleasant and healthy workplace environment for all employees of the company.

● Employee Safety and Health

Toyota Industries is involved in various activities to improve safety and health such as training its employees to behave safely in the workplace, improving the safety of machinery and establishing an occupational safety and health management system for its employees. These activities have led to an occupational accident rate that is below the industry average.

In the future, Toyota Industries will continue to promote its occupational safety and health management system in conjunction with carrying out risk assessments. These activities will help the company to achieve the goal of zero workdays lost due to on-the-job accidents.

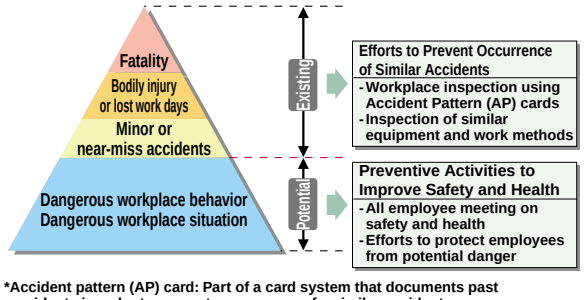
On-the-Job Accidents



■ Preventing Accidents at Work

Toyota Industries is involved in ongoing efforts to avoid near-miss accidents and accidents that may lead to lost workdays, bodily injury or fatality. The company is further involved in preventive measures to improve safety and health, which are designed to eliminate potentially dangerous workplace behavior and situations that may be dangerous to employees.

Measures to Prevent Occupational Accidents



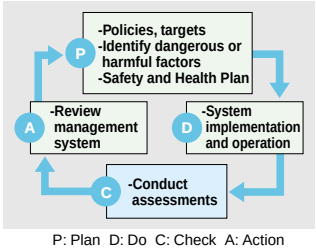
*Accident pattern (AP) card: Part of a card system that documents past accidents in order to prevent recurrences of a similar accident.

■ Occupational Safety and Health Management System

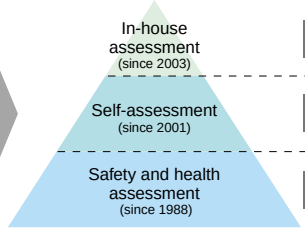
Toyota Industries is working to establish its own occupational safety and health management system for the benefit of its employees. This system further helps to improve the company's management quality by raising its standards for safety and health management and reducing the cost of occupational accidents. Toyota Industries has taken a multi-layered approach for its safety and health management system by deploying the system at the supervisor, managerial and business unit levels, with an emphasis on the labor-intensive activities of the company.

In FY 2002, Toyota Industries conducted an assessment of its safety and health management system at the managerial level, which is based on its safety and health management system for supervisors that was originally established in FY 1988. In the future, the company will continue to enhance its occupational safety and health management system, including at the department level.

Occupational Safety and Health Management System



P: Plan D: Do C: Check A: Action

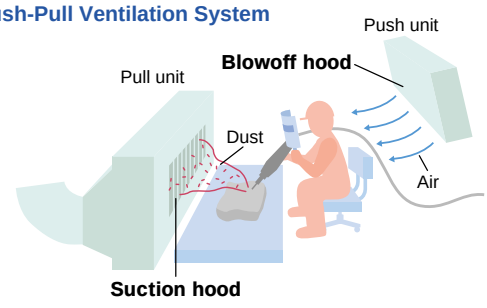


		FY 2002 Activity	FY 2003 Goal
Department level	In-house assessment	Discuss and prepare manual documentation	Introduce new efforts
Section level	Self-assessment	Conduct assessments using checklists	Continue to conduct assessments
Workplace level	Safety and health assessment	Implement new assessment items Conduct assessments by section managers	Continue to conduct assessments by section managers

■ Creating a Comfortable Workplace Environment

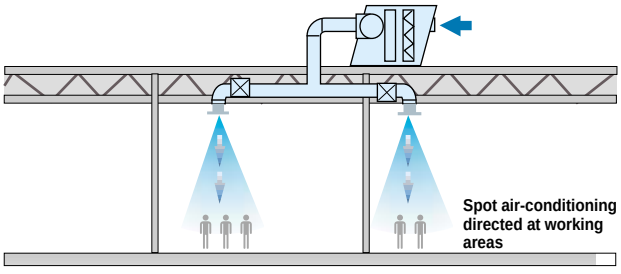
Toyota Industries is making every effort to provide a healthy and pleasant workplace for all its employees. The company is implementing measures to reduce noise, dust and other elements that can lead to illness such as welding fumes. Toyota Industries is also improving the human engineering aspect of its workplaces in order to make them more comfortable for employees, such as protecting employees from heat and reducing the burden of labor tasks.

Push-Pull Ventilation System



The push-pull ventilation system prevents excess dust inhalation by employing a pull unit that sucks in dust and a push system to supply air.

Barrier-Zone Air-Conditioning System



Barrier-zone air-conditioning systems provide spot air-conditioning to improve comfort for employees and reduce energy consumption. Human engineering assessments are conducted to identify locations where spot air-conditioning is needed.
Plants with barrier-zone air conditioning system: Kariya, Obu, Nagakusa, Takahama, Hekinan, Higashiura

● Promoting Employee Health

Toyota Industries is involved in a variety of efforts aimed at promoting both the mental and physical well-being of its employees, using a balanced approach that is also advocated by Japan's Ministry of Health, Labor and Welfare. Information about the company's activities to improve employee health is available through its corporate intranet.

Programs include health improvement seminars that are geared toward various age levels and wellness education aimed at preventing illnesses among employees. The company has also held seminars on preventing lower back pain, the most recent of which was attended by 128 employees. A survey conducted after the most recent seminar found that 80% of the attendees experienced some improvement after having attended the seminar.

Toyota Industries also holds events such as quit smoking campaigns and group walks that are designed to encourage its employees to quit smoking and exercise regularly.

Toyota Industries is striving to ensure the mental well-being of its employees by focusing on education, so that the company can rapidly identify employees who may need counseling or therapy. Toyota Industries also offers regular medical checkups for all of its employees. In FY 2002, the company created the "Hot Communication Card" for its employees, which encourages employees to greet each other and provides useful medical contact information.

Major Activities to Promote Employee Health

	Activities	
Health education	Health Improvement Seminar	For employees aged 30, 35, 45 and 50
	Prime Plan	For employees aged 40-49
	White Plan	For employees aged 55-59
	Challenge Course	Lifestyle-related illness education
	Lower Back Pain Prevention Seminar	Preventive measures for lower back pain
	Mental health education	Education for managers
Events	Quit Smoking Marathon	Encourage employees to quit smoking
	Walks/hikes	Encourage exercise with family participation

Lower Back Pain Prevention Seminar

Health Management Information on Corporate Intranet

Hot Communication Card

Spotlight Adoption of Company Uniforms Made From Recycled Plastic Bottles

As part of its green purchasing activities, Toyota Industries began purchasing company uniforms made from recycled plastic bottles in February 2003. The uniforms satisfy the Green Purchasing Network's guidelines regarding purchases of uniforms, office clothing and work clothes, while also offering the same price and comfort as the previous uniforms. In addition, Toyota Industries began collecting used uniforms for recycling into materials such as the insulation used in automobiles. The program has been publicized in the company's in-house magazine in order to increase awareness among employees.

FY 2002 Environmental Data

■ Toyota Industries Group Group-Wide Environmental Data

Category	Environmental Performance Index			Unit	Toyota Industries Non-consolidated*	Domestic Subsidiaries	Overseas Subsidiaries	Total
Input	Raw materials	Metals	Ferrous	t	141,163	144,248	NA	285,411
			Non-ferrous	t	113,333	88,157		201,490
			Total	t	254,496	232,405		486,901
		Nonmetals	Resins	t	36	116		152
			Inorganic compounds	t	0	282		282
			Total	t	36	398		434
		Water	Industrial water	km^3	1,594	26		1,620
			Municipal water	km^3	611	71		682
			Well water	km^3	1,696	2,117		3,813
			Total	km^3	3,901	2,214		6,115
		Chemical substances	Toxic materials	t	4,537	1,602		6,139
			PRTR-designated substances	t	2,517	272		2,789
		Packing materials	Wood	t	2,938	55		2,993
			Cardboard	t	1,299	348		1,647
			Plastics	t	80	41		121
			Other	t	24	7		31
		Office supplies	Copy paper	t	136	42		178
	Energy	Purchased electric power		MWh	386,966	278,309	142,275	807,550
		City gas		km^3N	56,225	15,597	4,024	75,846
		LPG		t	113	1,496	805	2,414
		A heavy oil		kl	365	119	1,251	1,735
		Kerosene		kl	1,779	220	—	1,999
		Coke		t	8,297	—	—	8,297
		Gasoline		kl	258	216	—	474
		Light oil		kl	368	75	323	766
	Electric power generated	Co-generation		kWh	81,352	—	—	81,352
		Solar-generated		kWh	84	—	—	84
		Wind-generated		kWh	1	—	—	1
Output	Greenhouse gases	Production activities	CO_2	kt-CO_2	292	138	141	571
			CH_4	kt-CO_2	—	—	—	0
			N_2O	kt-CO_2	—	0.5	—	0.5
			HFC	kt-CO_2	7	0	0	7
			PFC	kt-CO_2	9	0	—	9
			SF_6	kt-CO_2	—	1	—	1
			Total	kt-CO_2	308	139.5	141	588.5
		For logistics functions	Gasoline and other fuels	t-CO_2	2	1	NA	3
			Logistics	t-CO_2	6,922	2,015		8,937
			Total	t-CO_2	6,924	2,016		8,940
	Air pollutants	SOx		m^3N	854	50	604	1,508
		NOx		m^3N	34,854	7,525	6,108	48,487
		VOC		t	1,591	448	154	2,193
	Water pollutants	Wastewater		km^3	3,183	1,555	NA	4,738
		COD		t	17	2		19
		Nitrogen		t	14	4		18
		Phosphorous		t	0.1	0.1		0.2
	PRTR-designated substances	Released	Air	t	623	43		666
			Water	t	0.5	1		1.5
			Soil	t	—	—		0
		Transferred	Waste	t	94	211		305
			Sewage	t	—	—		0
	Waste	Reusable materials		t	73,733	8,538	15,298	97,569
		Recycled by third party		t	39,808	7,729	2,122	49,659
		Intermediate processing by third party		t	597	2,030	7,121	9,748
		Direct landfill		t	6,175	29	2,289	8,493
		On-site storage		t	0	—	4	4
		Recycling rate		%	85	79	18	73
		Non-industrial waste		t	1,821	187	NA	2,008
		Industrial waste subject to special control		t	19,720	11		19,731
	Hazardous substances	PCB storage	Condensers	Units	510	66		576
			Transformers	Units	0	2		2
			Other	Units	400	—		400

*Includes the performance of TIBC Corporation.

■ PRTR-Designated Substances Released and Transferred (Domestic Production Facilities)

Unit: kg

Category	Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
				Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
Toyota Industries	1	Zinc compounds (water-soluble)	15,584	—	224	—	—	224	3,744	—	3,744	—	—	11,616
	16	2-Aminoethanol	4,240	—	13	—	—	13	3,134	—	3,134	—	1,093	—
	25	Antimony	6,465	—	—	—	—	—	—	—	—	53	—	6,412
	30	Bisphenol-A epoxy resin	7,845	—	—	—	—	—	1,347	—	1,347	—	—	6,498
	40	Ethylbenzene	77,100	39,760	—	—	—	39,760	76	—	76	15,930	930	20,403
	43	Ethylene glycol	910,544	1,570	—	—	—	1,570	1,617	—	1,617	—	—	907,357
	63	Xylene	738,424	439,575	—	—	—	439,575	33,316	—	33,316	95,285	27,256	142,992
	68	Chromium and chromium (III) compounds	58,198	1	—	—	1,805	1,806	—	—	—	7,588	—	48,805
	101	2-Ethoxyethyl acetate	2,083	2,083	—	—	—	2,083	—	—	—	—	—	—
	176	Organic tin compounds	2,615	—	—	—	—	—	—	—	—	—	104	2,511
	177	Styrene	2,265	—	—	—	—	—	—	—	—	—	—	2,265
	198	Hexamethylenetetramine	4,950	—	—	—	—	—	—	—	—	—	—	4,950
	207	Copper salts (water-soluble, except complex salts)	2,957	—	30	—	—	30	1,449	—	1,449	—	—	1,478
	224	1,3,5-trimethylbenzene	13,941	8,097	—	—	—	8,097	12	—	12	5,822	10	—
	227	Toluene	353,442	130,368	—	—	—	130,368	14,346	—	14,346	14,675	7,535	186,517
	230	Lead and its compounds	4,034	—	—	—	—	—	—	—	—	2,028	—	2,006
	231	Nickel	25,708	2	—	—	—	2	—	—	—	4,785	1,104	19,817
	232	Nickel compounds	4,469	—	55	—	—	55	3,147	—	3,147	—	276	991
	299	Benzene	6,560	148	—	—	—	148	—	—	—	—	—	6,413
	304	Boron and its compounds	1,098	—	22	—	—	22	1,076	—	1,076	—	—	—
	307	Poly (oxyethylene) alkyl ether	6,287	—	102	—	—	102	3,774	—	3,774	—	102	2,309
	309	Poly (oxyethylene) nonylphenyl ether	1,283	—	—	—	—	—	—	—	—	—	—	1,283
	310	Formaldehyde	27,153	1,120	—	—	—	1,120	26,033	—	26,033	—	—	—
	311	Manganese and its compounds	185,994	—	49	—	7,623	7,672	567	—	567	78,817	—	98,938
	346	Molybdenum and its compounds	54,429	—	—	—	—	—	—	—	—	977	—	53,452
Domestic Subsidiaries	16	2-Aminoethanol	8,961	—	19	—	—	19	8,843	—	8,843	—	99	—
	40	Ethylbenzene	1,326	1,326	—	—	—	1,326	—	—	—	—	—	—
	43	Ethylene glycol	100,657	—	302	—	—	302	98,745	—	98,745	—	1,611	—
	63	Xylene	31,668	27,525	—	—	—	27,525	—	—	—	—	—	4,143
	109	2-Diethylaminoethanol	28,759	—	86	—	—	86	28,213	—	28,213	—	460	—
	227	Toluene	18,844	14,112	—	—	—	14,112	—	—	—	—	—	4,732
	283	Fluorine compounds, water-soluble chlorides	80,796	242	566	—	—	808	75,221	—	75,221	—	4,767	—
	311	Manganese and its compounds	1,329	—	—	—	—	—	—	—	—	44	—	1,285

■ Profiles of Subsidiaries Described in This Environmental Report

Company	Established	Capital	Employees	Major businesses	Headquarters	Web site
TIBC Corporation	1998	3,250 million yen	250	Manufacture and sales of plastic package substrate for IC chipsets	Aichi, Japan	www.tibc.co.jp
Tokyu Co., Ltd.	1941	135 million yen	272	Manufacture and sales of compressor components and industrial machinery	Aichi, Japan	www.tokyu-jp.com
Advanced Logistics Solutions Co., Ltd.	2002	100 million yen	27	Planning of distribution systems and operation of distribution centers	Aichi, Japan	—
Nishina Industrial Co., Ltd.	1939	100 million yen	253	Manufacture and sales of oil hydraulic equipment (industrial equipment and construction machinery)	Nagano, Japan	www.valley.ne.jp/chance/nishina
Tokaiseiki Co., Ltd.	1939	98 million yen	224	Manufacture and sales of compressor components	Shizuoka, Japan	http://ns.toukai-seiki.co.jp
ST Liquid Crystal Display Corp.*	1997	50,000 million yen	940	Manufacture of LCD panels	Aichi, Japan	www.stlcd.co.jp
Taikoh Transportation Co., Ltd.	1943	83 million yen	1,033	Trucking, car maintenance, warehousing	Aichi, Japan	www.taikoh.co.jp
BT Industries Group	1946	560 million SEK	7,613	Manufacture and sales of warehouse equipment	Mjölby, Sweden	www.bt-industries.com
Michigan Automotive Compressor, Inc.	1989	146 million US$	874	Manufacture and sales of car air-conditioning compressors and magnetic clutches	Michigan, US	www.michauto.com
Toyota Industrial Equipment Mfg., Inc.	1988	60 million US$	537	Manufacture and sales of industrial equipment and spare parts	Indiana, US	—
TD Deutsche Klimakomprssor GmbH	1998	20.452 million EUR	195	Manufacture and sales of car air-conditioning compressors and magnetic clutches	Straßgräbchen, Germany	—
Kirloskar Toyoda Textile Machinery Ltd.	1995	2,116.2 million Rs.	277	Manufacture and sales of spinning frames, manufacture and painting of car parts	Bangalore District, India	—
Toyota Industrial Equipment, S.A.	1995	9 million EUR	251	Manufacture and sales of industrial equipment and spare parts	Ancenis Cedex, France	—
ACTIS Manufacturing, Ltd. LLC	2001	2 million US$	41	Manufacture of aftermarket automotive air-conditioning compressors, manufacture of supplies	Texas, US	—

*ST Liquid Crystal Display Corp. is accounted for as an affiliate by the equity method.

Kariya Plant

Textile Machinery Division
Compressor Division

Address: 2-1, Toyoda-cho, Kariya, Aichi
Employees: 1,720
Main products: Textile machinery, car air-conditioning compressors

■ Environmental Impact Mass Balance

INPUT

Purchased electric power	82,646MWh	Coke	—
City gas	6,356km^3	Water	587km^3
LPG	—	Chemical substances: Toxic materials	84t
		Chemical substances: PRTR-designated substances	110t
A heavy oil	365 kl	Packaging	3,984t
Kerosene	2kl	Paper	44t

OUTPUT

Air	Greenhouse gas emissions	CO_2	45kt-CO_2
		Other	13kt-CO_2
	NO_x		4,070m^{3}N
	SO_x		0.1m^{3}N
Water	Total waste emissions		733km^3
	COD		4,103kg
	Nitrogen		2,264kg
	Phosphorous		29kg

Waste	Recycled by third party	1,440t
	Intermediate processing by third party	133t
	Direct landfill	—
	Recycling rate	92%
	Non-Industrial waste	416t

■ PRTR*1

Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
			Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
1	Zinc compounds (water-soluble)	1,097	—	25	—	—	25	202	—	202	—	—	870
40	Ethylbenzene	10,357	8,675	—	—	—	8,675	76	—	76	—	—	1,606
63	Xylene	81,838	72,966	—	—	—	72,966	750	—	750	—	—	8,122
224	1,3,5-trimethylbenzene	1,169	1,157	—	—	—	1,157	12	—	12	—	—	—
227	Toluene	12,710	891	—	—	—	891	3	—	3	—	—	11,816
299	Benzene	543	51	—	—	—	51	—	—	—	—	—	493
307	Poly (oxyethylene) alkyl ether	2,465	—	—	—	—	—	2,465	—	2,465	—	—	—

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NO_x (ppm)	Boiler	104	73
		120	38
		144	54
		150	44
		171	71
		237	70
	Gas turbine	50	43
Particulate matter (g/m^{3}N)	Boiler	0.1	0.002
		0.2	0.02
	Gas turbine	0.05	0.003

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.8-8.6	7.9	6.7	7.1
BOD	25 (20)	11.2	1.4	5.0
COD	—	9.8	0.2	5.6
SS	30 (20)	3.8	N.D.	0.7
N-hexane extractable material	5	2.0	N.D.	0.4
Phenol	5	N.D.	N.D.	N.D.
Copper	1	0.022	0.002	0.010
Zinc	5	0.200	N.D.	0.034
Soluble iron	10	0.300	0.068	0.126
Soluble manganese	10	0.062	0.015	0.03
Chromium	2	0.040	N.D.	0.003
Nitrogen oxide	(15)	4.08	1.48	3.09
Phosphorous	(2)	0.14	N.D.	0.04
Cadmium	0.1	0.005	N.D.	0.001
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.020	N.D.	0.005
Hexavalent chromium	0.5	N.D.	N.D.	N.D.
Arsenic	0.1	0.002	0.001	0.002
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	10	0.13	N.D.	0.03
Fluorine	8	0.35	N.D.	0.17

*1 PRTR: Unit: kg/year Dioxins: mg-TEQ/year
- The volume removed represents the quantity of PRTR-designated substances that have been converted into another substance through incineration, neutralization, decomposition or chemical reaction.
- The consumption volume represents the quantity of PRTR-designated substances that have been converted into another substance due to some type of reaction and has been used in or attached to a product which leaves the plant site.
- None of the company's production sites discharge sewage.

Takahama Plant

TOYOTA Material Handling Company

Address: 2-1, Toyoda-cho, Takahama, Aichi
Employees: 1,440
Main products: Forklift trucks, material handling systems

■ Environmental Impact Mass Balance

INPUT

Purchased electric power	26,790KWh	Coke	—
City gas	6,430km^3	Water	375km^3
LPG	—	Chemical substances: Toxic materials	49t
		Chemical substances: PRTR-designated substances	340t
A heavy oil	—	Packaging	344t
Kerosene	—	Paper	41t

OUTPUT

Air	Greenhouse gas emissions	CO_2	23kt-CO_2
		Other	—
	NO_x		3,801m^{3}N
	SO_x		—
Water	Total waste emissions		163km^3
	COD		708kg
	Nitrogen		732kg
	Phosphorous		16kg

Waste	Recycled by third party	952t
	Intermediate processing by third party	90t
	Direct landfill	—
	Recycling rate	91%
	Non-Industrial waste	70t

■ PRTR*1

Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
			Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
1	Zinc compounds (water-soluble)	1,362	—	29	—	—	29	1,087	—	1,087	—	—	246
40	Ethylbenzene	4,758	2,141	—	—	—	2,141	—	—	—	—	—	2,617
43	Ethylene glycol	10,786	—	—	—	—	—	—	—	—	—	—	10,786
63	Xylene	245,094	172,241	—	—	—	172,241	30,252	—	30,252	29,451	—	13,150
177	Styrene	2,265	—	—	—	—	—	—	—	—	—	—	2,265
227	Toluene	74,529	40,733	—	—	—	40,733	14,299	—	14,299	274	—	19,224
299	Benzene	879	47	—	—	—	47	—	—	—	—	—	833

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NO_x (ppm)	Boiler	120	79
	Gas turbine	35	31
	Oven	184	33
Particulate matter (g/m^{3}N)	Boiler	0.1	0.006
	Oven	0.2	0.018

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.8-8.6	7.6	6.5	7.1
BOD	25 (20)	5.1	0.2	3.4
COD	—	14.5	0.8	4.4
SS	30 (20)	6.6	N.D.	1.0
N-hexane extractable material	5	2.5	N.D.	0.6
Phenol	1	N.D.	N.D.	N.D.
Copper	1	0.023	0.004	0.011
Zinc	5	0.200	N.D.	0.059
Soluble iron	5	0.650	0.096	0.172
Soluble manganese	5	0.159	0.037	0.075
Chromium	2	0.040	N.D.	0.007
Nitrogen oxide	(15)	9.76	0.18	4.50
Phosphorous	(2)	0.58	N.D.	0.10
Cadmium	0.1	0.005	N.D.	0.001
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.020	N.D.	0.006
Hexavalent chromium	0.5	0.01	N.D.	0.01
Arsenic	0.1	0.007	N.D.	0.004
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	10	0.10	N.D	0.03
Fluorine	8	0.31	0.01	0.20

*2 Air: Control values are based on the emissions standards stated in the Air Pollution Control Law and prefectural ordinances. Actual measurements show the maximum value for measurements taken.
*3 Water: Unit measurements are in mg/l, excluding pH. Control values are based on the emissions standards stated in the Water Pollution Prevention Law and prefectural ordinances. The control value in parentheses is the daily average.
pH: Hydrogen Ion Concentration BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand SS: Suspended Solids N.D.: Not Detected (less than specified amounts).

Kyowa Plant

Corporate Technical Center, Mechatronics Engineering Sub-Division, TIBC Corporation

Address: 8, Chaya, Kyowa-cho, Obu, Aichi
Employees: 918
Main products: Electronic equipment, manufacturing equipment, press dies

■ Environmental Impact Mass Balance

INPUT

	Kyowa	TIBC
Purchased electric power	28,298KWh	32,282KWh
City gas	2,478km^3	4,681km^3
LPG		—
A heavy oil		—
Kerosene		—

		Kyowa	TIBC
Coke			—
Water			927km^3
Chemical substances	Toxic materials	5t	3,345t
	PRTR-designated substances	7t	37t
Packaging		5t	—
Paper		16t	2t

OUTPUT

Air	Greenhouse gas emissions	CO_2	38kt-CO_2
		Other	—
	NO_x		4,156m^{3}N
	SO_x		—
Water	Total waste emissions		908km^3
	COD		1,725kg
	Nitrogen		6,755kg
	Phosphorous		27kg

		Kyowa	TIBC
Waste	Recycled by third party	351t	25,285t
	Intermediate processing by third party	44t	123t
	Direct landfill	0t	—
	Recycling rate	89%	99.5%
	Non-Industrial waste	161t	

■ PRTR*1

Category	Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
				Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
Kyowa	63	Xylene	1,994	1,994	—	—	—	1,994	—	—	—	—	—	—
	227	Toluene	1,175	1,175	—	—	—	1,175	—	—	—	—	—	—
	230	Lead and its compounds	4,034	—	—	—	—	—	—	—	—	2,028	—	2,006
TIBC	16	2-Aminoethanol	3,147	—	13	—	—	13	3,134	—	3,134	—	—	—
	207	Copper salts (water-soluble, except complex salts)	2,957	—	30	—	—	30	1,449	—	1,449	—	—	1,478
	231	Nickel	1,656	—	—	—	—	—	—	—	—	—	1,104	552
	232	Nickel compounds	2,486	—	3	—	—	3	2,207	—	2,207	—	276	—
	304	Boron and its compounds	1,098	—	22	—	—	22	1,076	—	1,076	—	—	—
	310	Formaldehyde	26,050	17	—	—	—	17	26,033	—	26,033	—	—	—

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NO_x (ppm)	Boiler	120	90
		142	65
	Gas turbine	35	23
Particulate matter (g/m^{3}N)	Boiler	0.1	0.012
		0.3	N.D.
	Gas turbine	0.05	N.D.

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.8-8.6	7.5	6.5	6.8
BOD	25 (20)	3.7	0.1	1.4
COD	—	4	0.4	1.9
SS	30 (20)	6.4	0.1	1.2
N-hexane extractable oil	2	1	0.1	0.2
Phenol	5	N.D.	N.D.	N.D.
Copper	1	0.109	0.018	0.055
Zinc	5	0.65	N.D.	0.24
Soluble iron	10	0.45	0.083	0.12
Soluble manganese	10	0.115	0.003	0.038
Chromium	2	0.04	N.D.	0.003
Nitrogen oxide	(15)	11.28	3.6	7.44
Phosphorous	(2)	0.1	N.D.	0.03
Cadmium	0.1	0.005	N.D.	0.001
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.02	N.D.	0.006
Hexavalent chromium	0.5	N.D.	N.D.	N.D.
Arsenic	0.1	0.03	N.D.	N.D.
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	10	0.29	0.01	0.09
Fluorine	8	0.48	0.04	0.19

*1 PRTR: Unit: kg/year Dioxins: mg-TEQ/year
- The volume removed represents the quantity of PRTR-designated substances that have been converted into another substance through incineration, neutralization, decomposition or chemical reaction.
- The consumption volume represents the quantity of PRTR-designated substances that have been converted into another substance due to some type of reaction and has been used in or attached to a product which leaves the plant site.
- None of the company's production sites discharge sewage.

Nagakusa Plant

Vehicle Division

Address: 9-2, Yamaguchi, Nagakusa-cho, Obu, Aichi
Employees: 2,140
Main products: Automobiles

■ Environmental Impact Mass Balance

INPUT

Purchased electric power	46,798MWh	Coke	—
City gas	15,409km^3	Water	990km^3
LPG	113km^3	Chemical substances: Toxic materials	548t
		Chemical substances: PRTR-designated substances	1,432t
A heavy oil	—	Packaging	7t
Kerosene	1,770kl	Paper	13t

OUTPUT

Air	Greenhouse gas emissions	CO_2	52kt-CO_2
		Other	3kt-CO_2
	NOx		10,605m^{3}N
	SOx		—
Water	Total waste emissions		737km^3
	COD		8,169kg
	Nitrogen		2,241kg
	Phosphorous		37kg

Waste	Recycled by third party	2,295t
	Intermediate processing by third party	—
	Direct landfill	—
	Recycling rate	100%
	Non-Industrial waste	931tons

■ PRTR*1

Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
			Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
232	Nickel compounds	1,983	—	52	—	—	52	940	—	940	—	—	991
299	Benzene	4,229	2	—	—	—	2	—	—	—	—	—	4,226
1	Zinc compounds (water-soluble)	13,125	—	170	—	—	170	2,455	—	2,455	—	—	10,500
16	2-Aminoethan	1,093	—	—	—	—	—	—	—	—	—	1,093	—
30	Bisphenol-A epoxy resin	7,845	—	—	—	—	—	1,347	—	1,347	—	—	6,498
40	Ethylbenzene	59,305	28,921	—	—	—	28,921	—	—	—	15,930	930	13,523
43	Ethylene glycol	689,734	1,570	—	—	—	1,570	—	—	—	—	—	688,164
63	Xylene	389,547	188,066	—	—	—	188,066	2,314	—	2,314	65,834	27,256	106,077
101	2-Ethoxyethyl acetate	2,083	2,083	—	—	—	2,083	—	—	—	—	—	—
176	Organic tin compounds	2,615	—	—	—	—	—	—	—	—	—	104	2,511
224	1,3,5-trimethylbenzene	12,772	6,940	—	—	—	6,940	—	—	—	5,822	10	—
227	Toluene	240,833	86,271	—	—	—	86,271	26	—	26	14,401	7,535	132,599
307	Poly (oxyethylene) alkyl ether	2,565	—	102	—	—	102	52	—	52	—	102	2,309
310	Formaldehyde	1,103	1,103	—	—	—	1,103	—	—	—	—	—	—
311	Manganese and its compounds	3,070	—	48	—	—	48	567	—	567	—	—	2,455

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NOx (ppm)	Boiler	142	99
		144	110
		171	71
	Gas turbine	80	79
	Oven	184	120
		218	110
		237	N.D.
Particulate matter (g/m^{3}N)	Boiler	0.2	0.002
		0.25	0.003
		0.3	0.004
	Gas turbine	0.05	0.005
	Oven	0.1	0.009
		0.2	0.014
		0.4	N.D.

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.8-8.6	7.0	6.2	6.6
BOD	25 (20)	5.9	0.2	1.9
COD	—	17.7	7.1	11.0
SS	30 (20)	14.8	1.6	6.6
N-hexane extractable material	5	1.3	N.D.	0.6
Phenol	5	N.D.	N.D.	N.D.
Copper	1	0.017	0.001	0.007
Zinc	5	0.45	0.10	0.229
Soluble iron	5	0.450	0.099	0.156
Soluble manganese	5	0.150	0.021	0.065
Chromium	2	0.040	N.D.	0.003
Nitrogen oxide	(15)	4.22	1.6	3.04
Phosphorous	(2)	0.67	N.D.	0.05
Cadmium	0.1	0.005	N.D.	0.001
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.020	N.D.	0.005
Hexavalent chromium	0.5	0.01	N.D.	0.01
Arsenic	0.1	0.003	0.001	0.002
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	10	0.09	N.D.	0.03
Fluorine	8	0.66	0.22	0.40

*2 Air: Control values are based on the emissions standards stated in the Air Pollution Control Law and prefectural ordinances. Actual measurements show the maximum value for measurements taken.
*3 Water: Unit measurements are in mg/l, excluding pH. Control values are based on the emissions standards stated in the Water Pollution Prevention Law and prefectural ordinances. The control value in parentheses is the daily average.
pH: Hydrogen Ion Concentration BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand SS: Suspended Solids N.D.: Not Detected (less than specified amounts).

Obu Plant

Compressor Division

Address: 1-1, Ebata-cho, Obu, Aichi
Employees: 383
Main products: Parts for car air-conditioning compressors

■ Environmental Impact Mass Balance

INPUT

Purchased electric power	43,481MWh	Coke		649t
City gas	8,302km^3	Water		479km^3
LPG	—	Chemical substances	Toxic materials	56t
			PRTR-designated substances	66t
A heavy oil	—	Packaging		—
Kerosene	2kl	Paper		4t

OUTPUT

Air	Greenhouse gas emissions	CO_2	38kt-CO_2
		Other	—
	NO_x		4,831m^{3}N
	SO_x		758m^{3}N
Water	Total waste emissions		388km^3
	COD		1,785kg
	Nitrogen		1,125kg
	Phosphorous		—

Waste	Recycled by third party	1,804t
	Intermediate processing by third party	86t
	Direct landfill	1,099t
	Recycling rate	60%
	Non-Industrial waste	60t

■ PRTR*1

Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
			Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
63	Xylene	5,074	4,193	—	—	—	4,193	—	—	—	—	—	881
68	Chromium and chromium (III) compounds	17,885	1	—	—	—	1	—	—	—	3,355	—	14,530
198	Hexamethylenetetramine	4,950	—	—	—	—	—	—	—	—	—	—	4,950
227	Toluene	1,288	245	—	—	—	245	—	—	—	—	—	1,042
231	Nickel	6,202	2	—	—	—	2	—	—	—	4,702	—	1,498
307	Poly (oxyethylene) alkyl ether	1,257	—	—	—	—	—	1,257	—	1,257	—	—	—
309	Poly (oxyethylene) nonylphenyl ether	1,283	—	—	—	—	—	—	—	—	—	—	1,283
311	Manganese and its compounds	20,616	—	—	—	—	—	—	—	—	566	—	20,050
346	Molybdenum and its compounds	7,320	—	—	—	—	—	—	—	—	—	—	7,320

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NO_x (ppm)	Boiler	120	58
Particulate matter (g/m^{3}N)	Boiler	0.1	0.004

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.8-8.6	7.4	6.5	7.0
BOD	25 (20)	7.4	0.6	2.7
COD	—	11.0	1.6	4.6
SS	40 (30)	7.6	N.D.	2.2
N-hexane extractable material	2	0.8	N.D.	0.2
Phenol	1	0.01	N.D.	0.01
Copper	1	0.031	0.002	0.012
Zinc	5	0.450	0.001	0.120
Soluble iron	10	0.400	0.065	0.129
Soluble manganese	10	0.112	0.015	0.053
Chromium	2	0.004	N.D.	0.004
Nitrogen oxide	(15)	6.2	0.7	2.9
Phosphorous	(2)	N.D.	N.D.	N.D.
Cadmium	0.05	0.005	N.D.	0.001
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.003	N.D.	0.006
Hexavalent chromium	0.5	0.02	N.D.	0.01
Arsenic	0.1	0.004	0.004	0.004
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	10	0.06	N.D.	0.03
Fluorine	8	0.53	0.01	0.19

*1 PRTR: Unit: kg/year Dioxins: mg-TEQ/year
- The volume removed represents the quantity of PRTR-designated substances that have been converted into another substance through incineration, neutralization, decomposition or chemical reaction.
- The consumption volume represents the quantity of PRTR-designated substances that have been converted into another substance due to some type of reaction and has been used in or attached to a product which leaves the plant site.
- None of the company's production sites discharge sewage.

Hekinan Plant

Engine Division

Address: 3, Hama-cho, Hekinan, Aichi
Employees: 1,369
Main products: Engines (for use in automobiles and material handling equipment)

■ Environmental Impact Mass Balance

INPUT

Purchased electric power	51,754MWh	Coke		—
City gas	10,010km^3	Water		299km^3
LPG	—	Chemical substances	Toxic materials	48t
			PRTR-designated substances	248t
A heavy oil	—	Packaging		1t
Kerosene	—	Paper		12t

OUTPUT

Air	Greenhouse gas emissions	CO_2	36kt-CO_2
		Other	—
	NO_x		5,811m^{3}N
	SO_x		—
Water	Total waste emissions		104km^3
	COD		292kg
	Nitrogen		123kg
	Phosphorous		14kg

Waste	Recycled by third party	1,553t
	Intermediate processing by third party	81t
	Direct landfill	—
	Recycling rate	95%
	Non-Industrial waste	172t

■ PRTR*1

Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
			Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
40	Ethylbenzene	2,680	23	—	—	—	23	—	—	—	—	—	2,657
43	Ethylene glycol	210,024	—	—	—	—	—	1,617	—	1,617	—	—	208,407
63	Xylene	13,538	98	—	—	—	98	—	—	—	—	—	13,440
227	Toluene	20,943	1,003	—	—	—	1,003	18	—	18	—	—	19,922
299	Benzene	909	48	—	—	—	48	—	—	—	—	—	861

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NO_x (ppm)	Boiler	120	57
	Gas turbine	35	16
Particulate matter (g/m^{3}N)	Boiler	0.1	0.004
	Gas turbine	0.05	0.002

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.8-9.0	8.0	7.1	7.4
BOD	—	3.7	0.3	1.4
COD	20 (15)	6.7	1.1	2.8
SS	25 (20)	2.6	0.1	0.6
N-hexane extractable material	2	0.9	0.1	0.2
Phenol	1	N.D.	N.D.	N.D.
Copper	1	0.029	0.003	0.010
Zinc	3	0.200	N.D.	0.042
Soluble iron	3	0.111	0.039	0.083
Soluble manganese	5	0.102	N.D.	0.024
Chromium	2	0.040	N.D.	0.003
Nitrogen oxide	(15)	4.96	N.D.	1.18
Phosphorous	(2)	0.48	N.D.	0.13
Cadmium	0.1	N.D.	N.D.	N.D.
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.020	N.D.	0.006
Hexavalent chromium	0.5	N.D.	N.D.	N.D.
Arsenic	0.1	0.002	N.D.	0.002
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	230	0.06	N.D.	0.03
Fluorine	15	0.44	0.03	0.17

*2 Air: Control values are based on the emissions standards stated in the Air Pollution Control Law and prefectural ordinances. Actual measurements show the maximum value for measurements taken.
*3 Water: Unit measurements are in mg/l, excluding pH. Control values are based on the emissions standards stated in the Water Pollution Prevention Law and prefectural ordinances. The control value in parentheses is the daily average.
pH: Hydrogen Ion Concentration BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand SS: Suspended Solids N.D.: Not Detected (less than specified amounts).

Higashichita Plant

Engine Division

Address: 4-15, Nittou-cho, Handa, Aichi
Employees: 380
Main products: Foundry parts

■ Environmental Impact Mass Balance

INPUT

Purchased electric power	68,112MWh	Coke		7,648t
City gas	1,990km^3	Water		118km^3
LPG	—	Chemical substances	Toxic materials	111t
			PRTR-designated substances	277t
A heavy oil	—	Packaging		—
Kerosene	5kl	Paper		4t

OUTPUT

Air	Greenhouse gas emissions	CO_2	56kt-CO_2
		Other	—
	NO_x		1,250m^{3}N
	SO_x		96m^{3}N
Water	Total waste emissions		51km^3
	COD		230kg
	Nitrogen		267kg
	Phosphorous		2kg

Waste	Recycled by third party	6,028t
	Intermediate processing by third party	40t
	Direct landfill	5,076t
	Recycling rate	54%
	Non-Industrial waste	9t

■ PRTR*1

Ordinance No.	Chemical Substance	Amount Handled	Released Volume					Transferred Volume			Volume Recycled	Volume Removed	Consumption Volume
			Air	Water	Soil	On-site Landfill	Total	Waste	Sewage	Total			
25	Antimony	6,465	—	—	—	—	—	—	—	—	53	—	6,412
63	Xylene	1,339	17	—	—	—	17	—	—	—	—	—	1,322
68	Chromium and chromium (III) compounds	40,313	—	—	—	1,805	1,805	—	—	—	4,233	—	34,275
227	Toluene	1,964	50	—	—	—	50	—	—	—	—	—	1,914
231	Nickel	17,850	—	—	—	—	—	—	—	—	83	—	17,767
311	Manganese and its compounds	162,308	—	1	—	7,623	7,624	—	—	—	78,251	—	76,433
346	Molybdenum and its compounds	47,109	—	—	—	—	—	—	—	—	977	—	46,132

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NO_x (ppm)	Boiler	120	16
Particulate matter (g/m^{3}N)	Boiler	0.1	0.003
	Smelting furnace	0.05	0.011

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.0-9.0	8.0	6.6	7.5
BOD	—	10.3	0.3	1.6
COD	25 (20)	7.9	0.5	4.5
SS	30 (20)	7.8	N.D.	2.3
N-hexane extractable material	5	1.0	N.D.	0.2
Phenol	5	N.D.	N.D.	N.D.
Copper	1	0.028	0.002	0.011
Zinc	5	0.650	N.D.	0.379
Soluble iron	10	0.250	0.089	0.120
Soluble manganese	10	0.135	0.003	0.046
Chromium	2	0.040	N.D.	0.004
Nitrogen oxide	15	7.68	0.18	5.22
Phosphorous	2	0.10	N.D.	0.04
Cadmium	0.1	0.005	N.D.	0.001
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.020	N.D.	0.005
Hexavalent chromium	0.5	0.01	N.D.	0.01
Arsenic	0.1	N.D.	N.D.	N.D.
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	230	0.23	N.D.	0.09
Fluorine	15	1.44	N.D.	0.87

*1 PRTR: Unit: kg/year Dioxins: mg-TEQ/year
- The volume removed represents the quantity of PRTR-designated substances that have been converted into another substance through incineration, neutralization, decomposition or chemical reaction.
- The consumption volume represents the quantity of PRTR-designated substances that have been converted into another substance due to some type of reaction and has been used in or attached to a product which leaves the plant site.
- None of the company's production sites discharge sewage.

Higashiura Plant

Compressor Division

Address: 1-1, Shimomeotosaka, Ogawa, Higashiura-cho, Chita-gun, Aichi
Employees: 64
Main products: Parts for car air-conditioning compressors

■ Environmental Impact Mass Balance

INPUT

Purchased electric power	6,805MWh	Coke		—
City gas	569km^3	Water		126km^3
LPG	—	Chemical substances	Toxic materials	291t
			PRTR-designated substances	—
A heavy oil	—	Packaging		—
Kerosene	—	Paper		—

OUTPUT

Air	Greenhouse gas emissions	CO_2	4kt-CO_2
		Other	—
	NO_x		330m^{3}N
	SO_x		—
Water	Total waste emissions		99km^3
	COD		315kg
	Nitrogen		119kg
	Phosphorous		—

Waste	Recyled by third party	100t
	Intermediate processing by third party	—
	Direct landfill	—
	Recycling rate	100%
	Non-Industrial waste	2t

■ Air*2 (Complying with the Air Pollution Control Law, Prefectural Ordinances)

Item	Equipment	Control Value	Actual Measurement (Maximum)
NO_x (ppm)	Boiler	120	38
Particulate matter (g/m^{3}N)	Boiler	0.1	N.D.

■ Water*3 (Complying with the Water Pollution Prevention Law, Prefectural Ordinances)

Item	Control Value	Actual Measurement		
		Maximum	Minimum	Average
pH	5.8-8.6	8.0	6.9	7.4
BOD	25 (20)	6.0	N.D.	1.7
COD	—	12.0	0.2	3.2
SS	30	13.4	N.D.	4.4
N-hexane extractable material	2	1.4	N.D.	0.3
Phenol	1	N.D.	N.D.	N.D.
Copper	1	0.015	0.002	0.007
Zinc	5	0.500	0.050	0.254
Soluble iron	10	1.100	0.073	0.328
Soluble manganese	10	0.080	N.D.	0.017
Chromium	2	0.040	N.D.	0.003
Nitrogen oxide	(15)	3.12	0.48	1.21
Phosphorous	(0.5)	N.D.	N.D.	N.D.
Cadmium	0.05	0.005	N.D.	0.001
Total cyanide	1	N.D.	N.D.	N.D.
Lead	0.1	0.020	N.D.	0.008
Hexavalent chromium	0.3	N.D.	N.D.	N.D.
Arsenic	0.1	N.D.	N.D.	N.D.
Total mercury	0.005	N.D.	N.D.	N.D.
Selenium	0.1	N.D.	N.D.	N.D.
Boron	10	0.08	N.D.	0.02
Fluorine	8	0.42	0.01	0.15

*2 Air: Control values are based on the emissions standards stated in the Air Pollution Control Law and prefectural ordinances. Actual measurements show the maximum value for measurements taken.
*3 Water: Unit measurements are in mg/l, excluding pH. Control values are based on the emissions standards stated in the Water Pollution Prevention Law and prefectural ordinances. The control value in parentheses is the daily average.
pH: Hydrogen Ion Concentration BOD: Biochemical Oxygen Demand COD: Chemical Oxygen Demand SS: Suspended Solids N.D.: Not Detected (less than specified amounts).

Environmental Activity History

Date	Toyota Industries Milestones	Worldwide Trends
1971	Safety, Health, and Environment Department established	Environment Agency established
1984	Use of trichloroethylene fully phased out at all production plants	
1987		Montreal Protocol on Substances that Deplete the Ozone Layer is adopted
1992		United Nations Conference on Environment and Development (Earth Summit) is held.
1993	Mar. - Environmental plan (First Environmental Action Plan) established - Environmental Committee established - CFC Reduction Subcommittee established - Waste Reduction Subcommittee established - Communications and Public Relations Subcommittee established - Recycling Subcommittee established - Energy Subcommittee established Apr. Hekinan Plant receives a special award at the 12th Aichi Prefecture Greenery Competition Sep. Hekinan Plant receives an award at the 12th National Greenery Promotion Convention sponsored by the Japan Greenery Research and Development Center	Basic Environment Law*1 enacted
1994		Ozone Layer Protection Law amended, Basic Environment Plan enacted
1995	Feb. Use of trichloroethane fully phased out at all production plants Aug. Name of CFC Reduction Subcommittee changes to Chemical Management Subcommittee Sep. Hekinan Plant receives a Greenery Award from the Chubu Bureau of Economy, Trade and Industry	
1996	Jan. Name of Recycling Subcommittee changes to Product Technology Subcommittee Plant Environmental Committees established May Second Environmental Action Plan (FY 1996 to FY 2000) established Aug. Use of organic chloride-based solvents fully phased out at all production plants	ISO 14000 series of international standards enacted Air Pollution Control Law amended
1997	Aug. Name of Chemical Management Subcommittee changes to Pollution Prevention Subcommittee Oct. Nagakusa Plant acquires ISO 14001 certification	Kyoto Protocol adopted Law for Promotion of Sorted Collection and Recycling of Containers and Packaging goes into effect, Waste Management and Public Cleansing Law amended Law Concerning Promotion of the Use of New Energy and Environmental Impact Assessment Law enacted
1998	Oct. Kariya Plant (Compressor Division) acquires ISO 14001 certification Dec. Takahama Plant acquires ISO 14001 certification	
1999	Mar. Use of HCFCs during the manufacturing of electronic equipment fully phased out Jun. Toyota Industrial Equipment Mfg., Inc. (USA) acquires ISO 14001 certification (first consolidated overseas production facility to be certified) Nov. Hekinan Plant acquires ISO 14001 certification Dec. First Environmental Report published Report on PRTR pilot project (FY 1998) published	Law Concerning the Promotion of the Measures to Cope with Global Warming goes into effect, Law Concerning the Rational Use of Energy amended, Law Concerning Reporting, etc. of Release to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (PRTR Law), and Law Concerning Special Measures Against Dioxins enacted
2000	Jan. Kyowa Plant acquires ISO 14001 certification (subsidiary TIBC Corporation, situated adjacentto the Kyowa Plant, also acquires certification) Feb. Name of Waste Minimization Subcommittee changes to Resource Utilization Subcommittee Mar. Obu Plant acquires ISO 14001 certification Aug. Third Environmental Action Plan (FY 2001 to FY 2005) established Oct. Kariya Plant (Textile Machinery Division) acquires ISO 14001 certification	
2001	Mar. Guidelines on Reducing Substances of Concern, Recyclable Design Guidelines, and Environmentally Preferable Purchasing Guidelines issued Apr. Disclosure of environmental conservation activities related to the soil and underground water (trichloroethylene) Jul. North American compressor remanufacturer ACTIS established Oct. - Kariya Plant (headquarters) acquires ISO 14001 certification - Acquisition of ISO 14001 extended to the technical departments of Textile Machinery and Compressor divisions Nov. Tokyu Co., Ltd. acquires ISO 14001 certification (first consolidated domestic production facility to be certified)	The Basic Law for Establishing the Recycling-based Society enacted Waste Management and Public Cleansing Law amended Law for Promotion of Effective Utilization of Recyclable Resources and Law on Promoting Green Purchasing enacted Ministry of the Environment established Ministry of the Environment issues Environmental Reporting Guidelines (FY 2000 Version) Law for Promotion of Effective Utilization of Recyclable Resources amended, Waste Management and Public Cleansing Law and Law on Promoting Green Purchasing go into effect
2002	Feb. - Communications and Public Relations Subcommittee begins to serve as General Secretariat for environmental activities - Guidelines for evaluating the environmental impacts of products issued Mar. ISO 14001 certification acquired by all consolidated-overseas production facilities Apr. Environmental section of Toyota Industries' Web site established Dec. Toyota Industries' electrically driven CO_2 compressor is installed in fuel-cell hybrid vehicles developed by Toyota Motor Corporation	
2003	Jan. Toyota Industries Group Corporate Commitment to the Environment issued Feb. - Toyota Industries receives the Outstanding Energy Conservation Equipment Award for Excellence sponsored by ST Liquid Crystal Display Corporation and the Japan Association of Refrigeration and Air-Conditioning Contractors - Second edition of Environmentally Preferable Purchasing Guidelines issued Mar. Kariya Plant receives the Excellent Sustainable Management Award under the Japan Sustainable Management Award commendation system	The European Union's end-of-life vehicle (ELV) directive adopted Automobile Recycling Law enacted; Fluorocarbons Recovery and Destruction Law goes into effect Ministry of the Environment issues Environmental Accounting Guidelines (2002 Version)

Period covered by 1st Action Plan

Period covered by 2nd Action Plan

Period covered by 3rd Action Plan

*1 All "Laws" noted are Japanese laws.

Environmental Glossary

■ Glossary of Terms Used in This Report

Term	Definition
Alternative refrigerants	Alternative refrigerants such as hydrofluorocarbons (HFCs) were developed to replace chrolo-fluorocarbon (CFCs) based refrigerants, which cause ozone layer depletion. Toyota Industries uses the alternative refrigerant HFC-134a, which has now also been identified as contributing to global warming.
Automobile Recycling Law	Japanese law that stipulates the recycling of end-of-life vehicles.
Biological Oxygen Demand (BOD)	Demand for oxygen produced by pollutants suspended in water necessary for the pollutants to broken down by microorganisms. The BOD factor indicates the level of water pollution caused by organic substances.
Chemical Oxygen Demand (COD)	Amount of oxygen required to break down organic substances suspended in water, using a chemical such as an oxidizing agent or potassium permanganate. The COD factor indicates the level of organic pollution caused in lakes, rivers and oceans.
Chlorofluorocarbons (CFCs)	Production and use of chlorofluorocarbons has been banned since 1995 due to their contribution to ozone layer depletion.
Cogeneration system	System that uses gas turbines and engines to generate electricity, while simultaneously utilizing heat generation to supply hot water and fuel.
Endocrine disruptors	Substances that have been discovered to have a detrimental effect to the human body and animals. PCBs and dioxins have been identified as endocrine disruptors, although little is known about the mechanism by which they affect humans and animals.
End-of-life vehicle (ELV) directive	Directive issued by the European Union that mandates the reduced use of substances of concern and improved recyclability for end-of-life vehicles.
Eutrophication	Release of substances containing nitrogen and phosphorous into lakes and rivers from household wastewater and industrial wastewater, leading to the multiplication of plankton and microbes that affect water quality.
Functional unit	Reference unit for measuring the quantified performance based on a unit of measurement such as the number of units manufactured or net sales. Used to measure environmental factors such as energy consumption, water consumption and VOC emissions
Green procurement, green purchasing	Green procurement and green purchasing refer to the prioritized purchase of products and services that have less impact on the environment. Relevant legislation in Japan includes the Law on Promoting Green Purchasing, which was passed in 2000. At Toyota Industries, "green procurement" is used to refer to the procurement of raw materials and other items used to manufacture products. Purchasing of stationery and other office-related products is separately referred to as "green purchasing."

Term	Definition
ISO 14001	International standard for environmental management systems. Utilizes a Plan, Do, Check, Action (PDCA) cycle to improve environmental activities.
Lead-free	Absence of lead from products and parts.
Life cycle assessment (LCA)	Assessment of the total environmental impact of a product starting with the raw materials and extending to the manufacturing, transport, product use and product disposal. Life cycle assessments are conducted by measuring the substances consumed at each stage of the product life cycle.
Nitrous Oxides (NOx)	Compounds consisting of nitrogen and oxygen. NOx are produced during incineration of petroleum and coal. NOx are a cause of air pollution and acid rain.
Occupational safety and health management system	Management system that utilizes a Plan, Do, Check, Act (PDCA) cycle to manage the safety and health of employees.
Pollutant Release and Transfer Register (PRTR)	System in which chemical substances that are harmful to persons or ecosystems are tracked by producers to determine the level of release into the environment, or the amount transferred to other locations as part of industrial waste. The data are submitted to government authorities, which track the total emissions and transfer of pollutants. PRTR data are made available to the public by government authorities. Japan's PRTR Law was passed in July 1999.
Risk management	Risk management is used to forecast accidents and risks in order to establish appropriate countermeasures and systems for dealing with accidents. Examples of risk management include measures designed to prevent global pollution caused by substances of concern.
Sulfur oxides (SOx)	Sulfur oxides are produced during boiler and other incineration of fuel sources that contain sulfur. SOx are a cause of air pollution and acid rain.
Suspended solid (SS) concentration	Concentration of a substance suspended in water. Higher SS concentrations equate to poor water quality.
Sustainability	Concept of achieving growth and development of society without sacrificing the lifestyle standards of future generations.
Volatile Organic Compounds (VOCs)	Refers to chemical substances found in paint and other solvents.
Zero emissions of landfill waste	Defined by Toyota Industries as a 95% or greater reduction in direct landfill waste compared with FY 1998 levels, and a greater reduction in indirect landfill waste compared with FY 1999 levels.

■ Definitions of Environmental Conservation Costs (see p.13)

Environmental Conservation Categories		Definition
Business area costs	Pollution prevention	Investments and costs incurred by the construction of facilities and other measures aimed at preventing the seven typical types of pollution: air pollution, water contamination, soil contamination, noise pollution, vibration, land subsidence and foul odors.
	Global environmental conservation	Investments and costs incurred by measures dealing with global-scale environmental issues such as global warming and ozone layer depletion.
	Resource recycling	Costs incurred by equipment investments and other measures aimed at resource recycling.
Upstream/downstream costs		Investments and costs incurred by measures aimed at reducing the upstream and downstream environmental impact of the company's business activities.
Management costs		Costs incurred by indirect measures such as those aimed at reducing environmental impact. Examples include community dialog activities and environmental PR activities.
R&D costs		Investments and costs incurred by research and development conducted so that the company can provide environmentally friendly products to its customers.
Social activity costs		Costs incurred by environmental activities taking place in the community, which are not directly related to the company's business activities.
Environmental damage costs		Investments and costs incurred by countermeasures aimed at addressing damage caused to the environment.

■ Definitions for Industrial Waste and Zero Emissions (p.34-35)

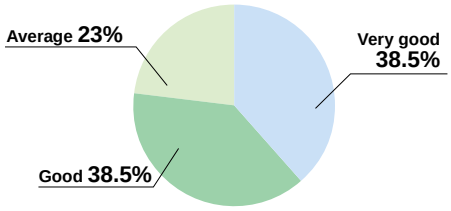
				Waste Processing Category		
				Landfill Waste		Recycling
				Direct	Indirect	
				Waste that is directly disposed in landfills without intermediate processing such as crushing or incineration	Waste that is subjected to intermediate processing such as crushing or incineration before being disposed in landfills	Waste that is recycled after intermediate processing
Waste	Waste that requires costs on disposal	Industrial waste	Waste produced from business activities	A	B	C
		Non-industrial waste	Other waste not categorized as industrial waste (including paper scraps, wood scraps and waste plastic producer from non-business activities)		D	E
Reusable materials	Waste materials that yield gain on disposal			F		

- A+B+C=Industrial waste generated (managed using targets set by Environmental Action Plan)
- A+B=Final disposal of industrial waste
- $\frac{C}{A+B+C}$ =Recycling rate
- Zero emissions of direct landfill waste: 95% or greater reduction in direct landfill waste (A) compared with FY 1998 levels
  Zero emissions of indirect landfill waste: 95% or greater reduction in indirect landfill waste (B) compared with FY 1999 levels

Reaction to Environmental Report 2002

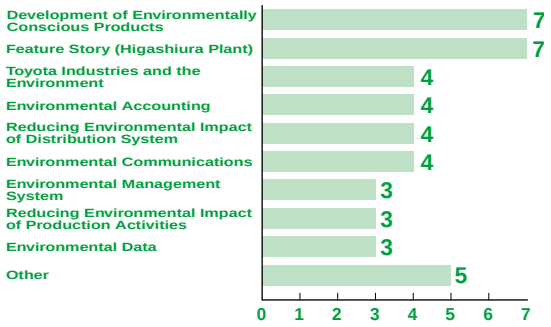
13 respondents sent in responses to the questionnaire regarding the Environmental Report 2002 (2,500 copies published in Japanese, 500 copies in English). The following describes their responses and shows how the feedback obtained was incorporated into Environmental Report 2003.

About the Environmental Report



* The response options "Fair" and "Poor" were also provided, but none of the respondents marked those options.

Articles that respondents found especially valuable (multiple responses allowed)



Incorporating Feedback into the Environmental Report 2003

Items that received positive comments and that will remain in the report

- Efforts were compiled according to each stage of operations (development, production, etc.), making the report easy to read.
- Efforts were described in detail, with specific examples.
- The environmental impact data for each plant was shown; it seems that efforts have been made to promote communications with the local residents near the plants.
- The PRTR data for all plants was organized in a manner that was easy to understand.

Suggestions for improvement and Toyota Industries' responses

- **The actual performance report is important, but it would be exciting to hear more about the activities planned for the long term.**
  ▶ The emphasis placed on reporting sample activities sometimes made it difficult to get a sense of the big picture, so we added the basic objectives and intermediate goals of each activity.

- **Some sections were difficult for the layperson to understand.**
  ▶ We did our best to eliminate specialized terminology to enable the largest possible audience to comfortably read the report, and also added footnotes and a glossary at the end of the report.

- **The Action Plans should include specific goals for a few more criteria.**
  ▶ We will take this recommendation into account in our future activities. We actively strove to provide figures indicating our "FY 2002 Achievements."

Editorial Note

Thank you for reading our Environmental Report 2003.

This report was intended to make our environmental conservation activities as easy to understand as possible. Please take a moment to complete the included questionnaire sheet, where you can let us know what you thought about the report and provide suggestions for improvement. Your comments will be taken into consideration in the preparation of future environmental reports as well as in our environmental conservation activities.

Our Web site now has a section devoted specifically to environmental issues. For more information on our environmental activities, please visit us on the Web.

Publication History (Annually since 1999)

FY 2002 Report

FY 2001 Report

Environmental reports published since 1999 are available on the Web (in pdf format) at:

www.toyota-industries.com/environment

Next report to be published July 2004.

(English Translation)

Independent Review Report

June 18, 2003

Tadashi Ishikawa
President, Toyota Industries Corporation

We, ChuoAoyama PwC Sustainability Research Institute Corporation, have been asked to carry out a review of the Environmental Report 2003 (the "Report"), which is the responsibility of Toyota Industries Corporation (the "Company"). The objective of this review is to provide an independent opinion on:
-Whether the data collection and aggregation process used to compile the Report were conducted in a reasonable manner in accordance with the Company's policies and rules; and
-Whether the data and information included in the Report were consistent with the supporting documents obtained and tested during our review.

Currently, there are no generally acceptable standards for assurance engagements of environmental reporting. Therefore, we have referred to emerging practices and guidance to perform this review.

We conducted review procedures at the Corporate Center and Business Support Center ("CO/BS"), the Kyowa Plant and the Hekinan Plant. Our review procedures are based on a test basis. Our opinion expressed in this report has its basis only within the scope of the review procedures we conducted.

At CO/BS, we conducted the following procedures to assess the processes, used by CO/BS to compile the Report, of collecting and aggregating information reported from the sites or subsidiaries in and outside the country, which includes:
-Analytical procedures;
-Inquiries of persons responsible for the preparation of the data both at CO/BS and sites we visited; and
-Inspection of data obtained and reconciliation of the data to supporting documents filed both at CO/BS and sites we visited.

At other sites, we conducted the following procedures to assess the processes, used by the sites to prepare reporting to CO/BS, of collecting and aggregating data reported from each department, which includes:
-Analytical procedures;
-Inquiries of persons responsible for the preparation of the data; and
-Inspection of data obtained and reconciliation of the data to supporting documents filed at each department.

Also, there are no generally acceptable standards for environmental reporting, which we can refer to in performance of our review. Therefore, the Report is the responsibility of, and has been prepared voluntarily by, the Company.

On the basis of the above work, we have reached the following opinion:
-The data collection and aggregation processes used to compile the Report were conducted in a reasonable manner in accordance with the Company's policies and rules; and
-The data and information included in the Report were consistent with the supporting documents obtained and tested during our review, and no significant errors which should have been corrected were identified as a result of our test.

ChuoAoyama PwC Sustainability Research Institute Corporation
(ChuoAoyama Audit Corporation Group)

If you have any questions or opinions regarding the content of this report or Toyota Industries' environmental conservation activities, please feel free to contact the Environmental Office of our Safety, Health & Environment Department.

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