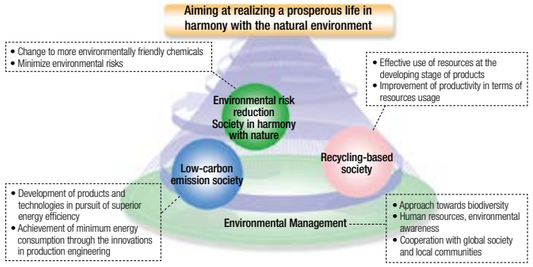
Environmental Initiatives

Vision for Environmental Activities

We have achieved the Fifth Environmental Action Plan and have launched the Sixth Environmental Action Plan in fiscal 2017.

Global Environmental Commitment

As one tenet under our Basic Philosophy, Toyota Industries works to contribute to regional living conditions and social prosperity and also strives to offer products and services that are clean, safe and of high quality. Accordingly, in February 2011, we established the Global Environmental Commitment, a specific environmental action guideline, to be shared and implemented throughout the Toyota Industries Group. The entire Toyota Industries Group comprising 165 companies in and outside Japan will dedicate concerted efforts to realizing a prosperous life in harmony with the natural environment.



Notional Diagram of Global Environmental Commitment

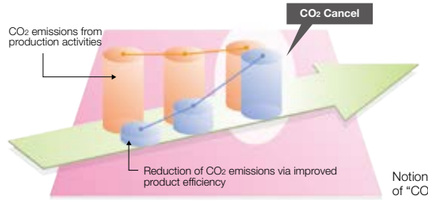
Achievement of the Fifth Environmental Action Plan

Toyota Industries completed its Fifth Environmental Action Plan covering the five years from fiscal 2012 to fiscal 2016.

We conducted activities according to the action items and targets laid out in the Fifth Plan. They included a 10% reduction in CO_2 emissions from major products to be developed during the period covered by the Fifth Plan; accomplishment of "CO_2 Cancel," our original concept to offset CO_2 emissions from production activities by reducing CO_2 emissions via improved product efficiency and other means; and improvement of environmental performance.

We successfully achieved all designated targets.

(See Five Years of Steady Progress on pages 56–57 and Summary of the Fifth Environmental Action Plan on pages 58–59 for details.)



Notional Diagram of "CO_2 Cancel"

CO_2 emissions from production activities
= Total CO_2 emissions from Toyota Industries' plants
Reduction of CO_2 emissions via improved product efficiency
= Total reduction in CO_2 emissions attained by major products which are manufactured at Toyota Industries' plants

Formulation of the Sixth Environmental Action Plan

Based on the Global Environmental Commitment that articulates our basic approach to environmental initiatives, we have formulated the Sixth Environmental Action Plan, a new five-year plan for the period from fiscal 2017 to fiscal 2021. The plan incorporates a far-sighted approach to creating a society with zero CO_2 emissions by 2050 with a view toward contributing to a society that realizes enriched lifestyles in harmony with the natural environment.

In formulating the new plan, we reviewed the results of activities under the Fifth Plan and specified key points as shown below on which to concentrate our efforts as the Toyota Industries Group in aggressively promoting the four action themes of the Global Environmental Commitment, namely, 1) establishing a low-carbon emission society; 2) establishing a recycling-based society; 3) reducing environmental risk and establishing a society in harmony with nature; and 4) environmental management.

(See the Sixth Environmental Action Plan on pages 60–61 for details.)

Key Points of the Sixth Environmental Action Plan

Challenge: Take on a challenge of reducing CO_2 emissions for a zero CO_2 society in 2050
- Develop products and technologies with the highest level of environmental performance
- Develop production engineering technologies with lower CO_2 emissions and utilize clean energy

Contribute: Contribute to a future society through technology development and resource utilization
- Develop technologies for the realization of a hydrogen-based society
- Promote measures against resource depletion by recycling waste

Give back: Nurture the natural environment and give back to nature
- Collaborate with all Toyota Group companies to promote activities of the Toyota Industries Group to promote greening activities
- Prepare and promote countermeasures against water depletion after determining water usage and wastewater amount

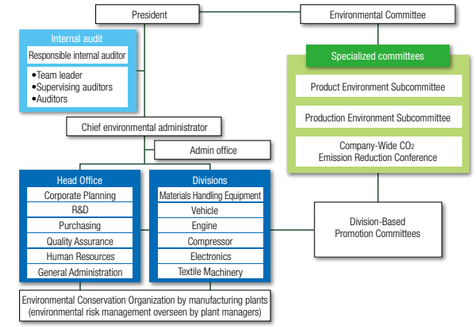
Structure to Implement Environmental Management

Positioning environmental response as one of its most crucial management issues, Toyota Industries is enhancing its environmentally oriented corporate management on a global basis through the promotion of consolidated environmental management.

Promotion of Environmental Management System

Toyota Industries has positioned environmental response as one of its most crucial management issues. To quickly reflect top management's decisions on business operations, Toyota Industries has established and been operating a Company-wide integrated environmental management system (EMS), with the president at the top.

■ **Environmental Management Structure**



In fiscal 2016, we continued to provide education to employees, including introductory courses for environmental management and environmental audits, in which the former is for cultivating required knowledge and the latter for gaining knowledge and techniques of internal audits. Proactive participation by department heads and others in managerial positions has enabled us to increase understanding of environmental management and develop internal auditors.

As a first attempt to enhance the quality of our audits, we invited an external institute to provide auditor education to supervising auditors engaging in internal audits.

Auditor education by an external institute

Environmental Audits

Toyota Industries implements annual internal environmental audits as well as external audits carried out by an independent third-party institute.

The external audit conducted in fiscal 2016 revealed no non-conformances. For matters pointed out in the audit to have the potential to cause non-conformances in the future, we will implement improvement measures and disseminate the relevant information to other plants to raise the overall level of environmental management.

We continued to conduct internal audits under the mutual, interdivisional audit system. In fiscal 2016, we strived to upgrade our auditing capabilities by organizing audit teams with the dual goals of fostering the development of auditors and increasing audit efficiencies. In the area of audits, our focus was placed on reducing environmental risks and improving environmental performance, and we successfully clarified how much each business division contributes to overall environmental management.

■ **Scope of Group-Wide Environmental Management** (As of March 31, 2016)

Non-production companies
Japan: 21
Outside Japan: 106

Europe
■ **Production companies: 6**
Toyota Material Handling Manufacturing Sweden AB (Sweden)
Toyota Material Handling Manufacturing Italy S.p.A. (Italy)
Toyota Material Handling Manufacturing France SAS (France)
L.T.E. Lift Truck Equipment S.p.A. (Italy)
TD Deutsche Klimakompressor GmbH (Germany)
Uster Technologies AG (Switzerland)

Asia
■ **Production companies: 8**
Toyota Industrial Equipment Vietnam Co., Ltd. (Vietnam)
Toyota Industries Engine India Private Limited (India)
Kirloskar Toyota Textile Machinery Pvt. Ltd. (India)
P.T. TD Automotive Compressor Indonesia (Indonesia)
Toyota Industry (Kunshan) Co., Ltd. (China)
TD Automotive Compressor Kunshan Co., Ltd. (China)
Yantai Shougang TD Automotive Compressor Co., Ltd. (China)
Tailift Material Handling Taiwan Co., Ltd. (Taiwan)

Japan
■ **Non-consolidated: 10 plants**
■ **Production companies: 13**
Aichi Corporation (Saitama)
Nishina Industrial Co., Ltd. (Nagano)
Takeuchi Industrial Equipment Manufacturing Co., Ltd. (Aichi)
HANDA Casting Company (Aichi)
Unica Co., Ltd. (Aichi)
Tokaiseiki Co., Ltd. (Shizuoka)
Altex Co., Ltd. (Shizuoka)
IZUMI MACHINE MFG. CO., LTD. (Aichi)
Nagao Kogyo Co., Ltd. (Aichi)
Miduho Industry Co., Ltd. (Aichi)
Iwama Loom Works, Ltd. (Aichi)
Tokyu Co., Ltd. (Aichi)
Hara Corporation (Gifu)

North America
■ **Production companies: 9**
Cascade Corporation (U.S.A.)
Indiana Hydraulic Equipment, Corp. (U.S.A.)
North Vernon Industry Corp. (U.S.A.)
Raymond-Muscatine Inc. (U.S.A.)
The Raymond Corporation (U.S.A.)
Toyota Industrial Equipment Mfg., Inc. (U.S.A.)
Michigan Automotive Compressor, Inc. (U.S.A.)
TD Automotive Compressor Georgia, LLC (U.S.A.)
Toyota Industries Compressor Parts America, Co. (U.S.A.)

Latin America
■ **Production company: 1**
Toyota Material Handling Mercosur Indústria Comércio de Equipamentos Ltda (Brazil)

Five Years of Steady Progress

Toyota Industries completed its Fifth Plan covering the five years from fiscal 2012 to fiscal 2016.

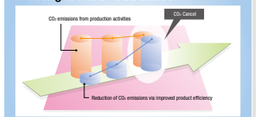
This section provides a digest of our efforts in the past five years taken from our previous *Toyota Industries Reports*.

Details of each topic are available at our corporate website.

- Establishing a Low-Carbon Emission Society
- Establishing a Recycling-Based Society
- Reducing Environmental Risk and Establishing a Society in Harmony with Nature
- Environmental Management

FY2012
(Ended March 31, 2012)

"Formulation of the Fifth Environmental Action Plan"
Working toward "CO_2 Cancel"



Toyota Industries Report 2012 P**62**

"Lecture on the environment (by Mr. Ukyo Katayama)"
What everyone can do now for the environment

Toyota Industries Report 2012 P**70**

"Wall greening activity received the Best Award in Aichi Green Curtain Contest"

Toyota Industries Report 2012 P**70**

"Introduction of internal eco-point system"
Selection of our corporate eco character

Toyota Industries Report 2012 P**70**

FY2013
(Ended March 31, 2013)

"A biotope to link people, nature and the local community"

Toyota Industries Report 2013 P**58**

"Won Biotope Award in the Fifth Biotope Commendation"

Toyota Industries Report 2013 P**61**

"Won silver prize of the Aichi Environmental Awards for serializing electric compressors"

Toyota Industries Report 2013 P**66**

"Received the Environment Minister's Award for global warming prevention activity"

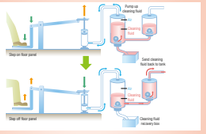
Toyota Industries Report 2013 P**68**

FY2014
(Ended March 31, 2014)

"Reinforcing activities to reduce peak power consumption by visualizing use of electricity"

Toyota Industries Report 2014 P**64**

"Recovering cleaning fluid by a mechanical pump"



Toyota Industries Report 2014 P**66**

"Enlightenment activities utilizing environmental AP cards"

Toyota Industries Report 2014 P**67**

"TMHE (consolidated subsidiary outside Japan) to publish its first social and environmental report"

Toyota Industries Report 2014 P**69**

FY2015
(Ended March 31, 2015)

"Toyota 1KD industrial diesel engine received Logistics Environmental Technology Development Award"

Toyota Industries Report 2015 P**67**

"Compiling and disseminating waste disposal know-how within Toyota Industries" Issued Waste Disposal Handbook

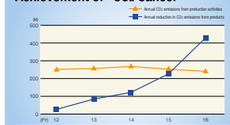
Toyota Industries Report 2015 P**69**

"Visualizing risk through piping inspections"

Toyota Industries Report 2015 P**70**

FY2016
(Ended March 31, 2016)

"Completion of the Fifth Environmental Action Plan"
Achievement of "CO_2 Cancel"

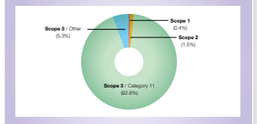


Toyota Industries Report 2016 P**63**

"Certification of environmentally friendly products"
19 items certified in 10 years

Toyota Industries Report 2016 P**63**

"Calculating greenhouse gas emissions in the supply chain"



Toyota Industries Report 2016 P**68**

"Tree-planting event held during Environment Month in India"

Toyota Industries Report 2016 P**69**

FY2017
(Ending March 31, 2017)

"Formulation of the Sixth Environmental Action Plan"
Taking on a challenge of creating a society with zero CO_2 emissions

Toyota Industries Report 2016 P**60**

Taking another step forward
under the Sixth Environmental Action Plan

Internally Used Posters on Energy Saving

Energy saving we all can do

Save energy to create a better future for children

Keep the environment clean for our future

A little care

Everyone to support the future earth

Details are available at our corporate website.

Toyota Industries Search

http://www.toyota-industries.com/

Summary of the Fifth Environmental Action Plan

We have achieved all targets for fiscal 2016.

Fifth Environmental Action Plan

With an eye to realizing a prosperous life in harmony with the natural environment through the establishment of a sustainable society, we formulated the Fifth Environmental Action Plan for the period from fiscal 2012 to fiscal 2016 and promoted activities according to the plan.

Through activities undertaken during these years, we have achieved all respective targets laid out in the plan.

■ Product Related

Fifth Environmental Action Plan Targets			FY2016 Achievements
Segments	**Action Policies**	**Specific Actions**	
Establishing a Low-Carbon Emission Society	Reduce CO_2 emissions by 10%*1 from major products to be developed during the period covered by the Fifth Plan		• Reduced CO_2 emissions by 17%
	In the Automobile-Related Business, promote electrification and develop technologies and products that will contribute to reduction of CO_2 emissions	• Improve energy efficiency of car air conditioners • Develop technologies to respond to electrification of vehicles • Develop technologies to enable weight reduction • Reduce energy loss • Develop new engines	<Automobile-Related Business> • Developed highly efficient electric car air-conditioning compressor <Materials Handling Equipment Business> • Improved energy efficiency of electric lift truck <Textile Machinery Business> • Developed technologies to reduce power consumption
	In the Materials Handling Equipment Business, develop technologies and products that will contribute to reduction of CO_2 emissions	• Improve fuel efficiency of internal-combustion lift trucks • Reduce energy loss in electric-powered lift trucks and improve energy efficiency of functional units	
	In the Textile Machinery Business, develop technologies and products that will contribute to reduction of CO_2 emissions	• Reduce energy use through lower air consumption • Reduce power use through lower load from windage loss • Reduce energy loss	
	In the R&D field, develop technologies for energy efficiency	• Develop new technologies that contribute to improved energy efficiency in automobiles	
Establishing a Recycling-Based Society	Implement initiatives to promote 3R (reduce, reuse and recycle) design for effective resource utilization	• Reduce use of resources through longer product life • Reduce use of resources through standardization, modularization and reduction of components • Reduce use of resources through weight and size reductions • Promote reuse of components and resources	• Developed plastic glazing rear window
Reducing Environmental Risk and Establishing a Society in Harmony with Nature	Reduce emissions to improve air quality in urban areas in all countries and regions	• Develop engines that meet future regulations	• Developed lift truck engines compliant with emissions regulations ahead of schedule
	Manage chemical substances contained in products	• Investigate chemical substances contained in products and manage switching over of SVHC*2 and other substances of concern to other substances	• Expanded the scope of substances of concern (investigated substances of concern contained in supplies)

■ Production Related

Fifth Environmental Action Plan Targets							FY2016 Achievements	Assessment
Segments	**Action Policies/Specific Actions**	**Subject**	**Scope**	**Control Items**	**Base Year (FY)**	**Targets**		
Establishing a Low-Carbon Emission Society	Promote energy reduction and energy conservation through innovative production technologies Reduce greenhouse gas emissions during production processes through energy JIT*3 Promoting measures to curb global warming	CO_2 emissions •Energy-derived CO_2 •5 gases*4 •CO_2 from logistics	Non-consolidated	Total emissions	2006	-18%	-22%	√
			Global	Eco efficiency*5	2006	1.27	1.34	√
			Non-consolidated			1.47	1.53	√
	Reduce CO_2 emissions through green logistics	CO_2 from logistics	Non-consolidated	Total emissions	1991	-20%	-35%	√
				Eco efficiency	2007	1.09	1.59	√
Establishing a Recycling-Based Society	Enhance resource productivity • Reduce use of timber-derived packaging materials • Reduce the volume of discarded materials by taking action at the source, such as improving yields and other measures • Promote internal reuse	Packaging material volume	Non-consolidated	Eco efficiency	2007	1.09	4.20	√
		Waste generation volume	In Japan	Eco efficiency	2013	1.01	1.14	√
			Non-consolidated			1.01	1.14	√
Reducing Environmental Risk and Establishing a Society in Harmony with Nature	Further reduce emissions of substances of concern Minimize environmental risks • Expand the use of a preliminary review system • Reduce risks related to wastewater • Appropriately manage chemical substances based on social conditions • Enhance risk communication with relevant organizations and local residents	VOC*6 emissions	Non-consolidated (automobile body)	Emission volume per unit of production	—	24 (g/m^2)	24 (g/m^2)	√

■ Promoting Environmental Management

Fifth Environmental Action Plan Targets		FY2016 Achievements
Action Policies	**Specific Actions**	
Reinforce CO_2 reduction activities for "CO_2 Cancel"	• Further reduce CO_2 emitted from production activities in plants • Aim to cancel out CO_2 emissions of Toyota Industries by reducing CO_2 emissions through improved efficiency in newly developed products	• Achieved "CO_2 Cancel"
Augment and promote consolidated environmental management	• Build a global environmental management system and promote related activities to: 1) Comply with environment-related laws and reduce environmental risks in each country 2) Achieve the highest-level environmental performance in each country • Aim for efficient and systematic corporate management by integrating and operating environmental management system and quality/safety management systems	• Strengthened environmental performance and environmental risk reduction measures of consolidated subsidiaries in and outside Japan
Enhance and promote environmental education and enlightenment activities	• Develop environmental specialists to lead internal environment-related activities • Strengthen internal environment-related activities and broaden family-friendly initiatives by planning and promoting enlightenment activities that can be carried out at home	• Conducted environmental awareness survey among employees, which scored 4.0 out of 5 points
Improve eco-conscious brand image	• Reinforce environmental activities according to the contents and results of Survey of Environmental Oriented Management Index to pursue higher brand image	• Certified the GENEO-Ecore as an environmentally friendly product
Augment activities related to protection of biodiversity	• Identify the impact of business activities on biodiversity and reinforce initiatives by defining specific goals • Contribute to biodiversity through conservation of forests and protection of rare species	• Conducted maintenance and management activities at Biotope of the East of Obu Station, which were jointly carried out with the local community • Held biotope tour for students
Promote sustainable plant activities	• Build a plant environment in harmony with nature by promoting energy reduction and energy conservation through innovative production engineering, by reducing energy loss and by using renewable energy and other means	• Continually reviewed energy strategy for the medium to long term

*1: Target products Toyota Industries develops and produces. The CO_2 reduction volume is calculated based on the method Toyota Industries determined using FY2011 levels as the baseline.
*2: Substances of Very High Concern
*3: Just In Time
*4: Greenhouse gases other than CO_2, including methane (CH_4), dinitrogen monoxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6)
*5: Eco-efficiency = Production efficiency in subject year / Production efficiency in base year
Production efficiency = Production indicator (Net sales or production volume, etc.) / Environmental impact of production activities
*6: Volatile Organic Compounds

Sixth Environmental Action Plan

We have formulated another five-year action plan for the period from fiscal 2017 to fiscal 2021.

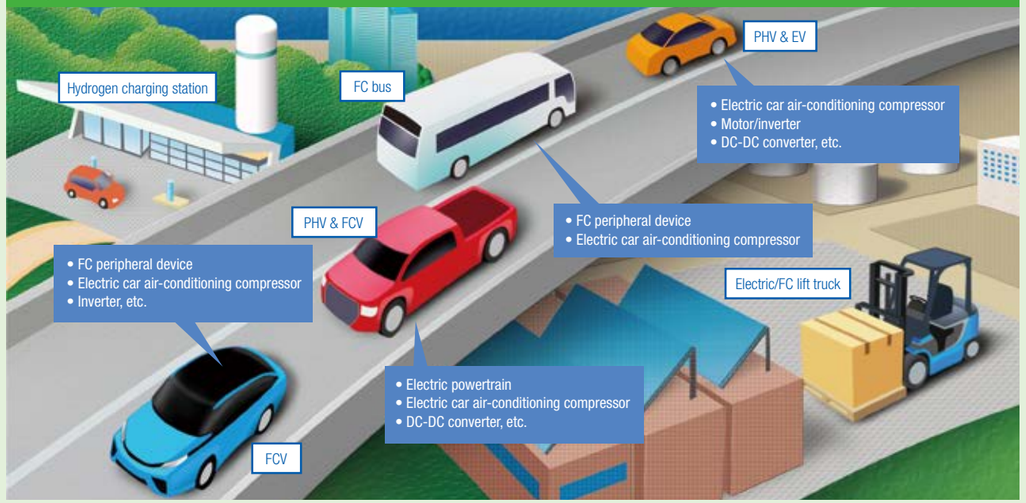
The Sixth Environmental Action Plan continues to focus on the four key areas specified in the Fifth Plan. These are: establishing a low-carbon emission society; establishing a recycling-based society; reducing environmental risk and establishing a society in harmony with nature; and promoting environmental management. Of these four areas, we place a particular emphasis on the establishment of a low-carbon emission society and implement initiatives specifically designed for the creation of a society with zero CO_2 emissions by 2050.

Action Themes	Segments	Action Policies	Primary Actions and Targets
Establishing a Low-Carbon Emission Society	**Products**	Reduce CO_2 emissions through product and technology development	• Develop technologies that contribute to an even greater level of energy efficiency • Develop products and technologies that respond to electrification • Develop technologies to enable weight reduction • Reduce energy loss • Develop technologies for the realization of a hydrogen-based society
	Production	Reduce CO_2 emissions from production activities	• Develop and introduce production engineering technologies with lower CO_2 emissions • Reduce CO_2 emissions by fully implementing improvement activities on a daily basis • Develop innovative CO_2 reduction technologies that utilize clean energy ■ Reduction of CO_2 emissions Global / Emission volume per unit of production*1 / 26% reduction vs FY06 level Non-consolidated / Emission volume per unit of production / 30% reduction vs FY06 level Non-consolidated / Total emissions / 10% reduction vs FY06 level • Manage greenhouse gases other than CO_2
	Logistics	Reduce CO_2 emissions from production-related logistics	• Improve transportation efficiency through such measures as modal shift and better cargo loading efficiency ■ Reduction of CO_2 emissions from logistics Non-consolidated / Emission volume per unit of production / 28% reduction vs FY07

—Example initiative for the creation of a zero CO_2 emission society—

Taking on a challenge of achieving zero CO_2 emissions from use of our products or vehicles equipped with our products

Image of an energy society with zero CO_2 emissions



Action Themes	Segments	Action Policies	Primary Actions and Targets
Establishing a Recycling-Based Society	**Products**	Implement initiatives to promote 3R (reduce, reuse and recycle) design for effective resource utilization	• Reduce use of resources through longer product life • Reduce use of resources through standardization, modularization and reduction of components • Reduce use of resources through development of technologies to enable weight reduction and downsizing • Promote reuse of components and resources
	Production	Promote measures against resource depletion by recycling waste	**Waste** • Reduce the volume of discarded materials by taking action at the source, such as improving yields and other measures • Promote internal reuse ■ Reduction of waste generation volume Japan consolidated / Waste generation volume per unit of production / 27% reduction vs FY06 level Non-consolidated / Waste generation volume per unit of production / 29% reduction vs FY06 level
		Promote effective resource utilization in production activities	**Packaging materials** • Reduce use of packaging materials **Water** • Monitor water input and output in each country/region and develop and promote appropriate measures

Action Themes	Segments	Action Policies	Primary Actions and Targets
Reducing Environmental Risk and Establishing a Society in Harmony with Nature	**Products**	Reduce emissions to improve air quality in urban areas in all countries and regions	• Develop engines that meet future regulations
		Manage chemical substances contained in products	• Investigate chemical substances contained in products and manage switching over of SVHC*2 and other substances of concern to other substances
	Production	Further reduce emissions of substances of concern	• Minimize the use of substances of concern by promoting efficient production activities ■ Reduction of VOC*3 emissions Non-consolidated (automobile body) / Emission volume per unit of production (g/m^2) / 36% reduction vs FY06 level (24 g/m^2)
	General	Augment activities related to protection of biodiversity	• Share the biodiversity guidelines across all Toyota Group companies and contribute to the expansion of a habitat for living organisms • Formulate and promote plans to link activities and bring more greenery by undertaking activities for conservation of biodiversity throughout the Toyota Industries Group, including at consolidated subsidiaries in and outside Japan

Action Themes	Segments	Action Policies	Primary Actions and Targets
Promoting Environmental Management	**General**	Augment and promote consolidated environmental management	• Build a global environmental management system and promote related activities to: Comply with environment-related laws in each country and region Formulate a medium-term plan based on visualization of environmental risks and conduct activities to prevent risks from occurring Enhance risk communication with relevant organizations and local residents Achieve the highest-level environmental performance in each country and region • Enforce strategic environmental management that integrates environmental activities and business activities
		Enhance education and enlightenment activities	• Extend the scope of Toyota Industries' enlightenment activities to consolidated subsidiaries in and outside Japan • Give back to society the outcomes of enlightenment activities
		Promote environmental activities in collaboration with business partners	• Ensure compliance with laws and regulations and improve environmental performance based on the Environmentally Preferable Purchasing Guidelines
		Improve eco-conscious brand image	• Pursue higher brand image through proactive information disclosure

*1: We manage emissions in each business by using either unit of production or unit of sales as a basic unit of emissions. The weighted average of reduction rates of all businesses is used as our management index.
*2: Substances of Very High Concern
*3: Volatile Organic Compounds
† Details of the Sixth Environmental Action Plan are available at:
http://www.toyota-industries.com/csr/environment/management/plan6.html/

Establishing a Low-Carbon Emission Society

We position the establishment of a low-carbon emission society as our most crucial environmental task. We have been working to reduce CO_2 emissions in our global business activities and at the same time accelerate our efforts to develop more environment-friendly products.

Summary

CO_2 Emissions (Production Activities)

FY2016 Results

Total emissions (non-consolidated)

22% reduction (vs FY06 level)

FY16 target: 18% reduction (vs FY06 level)

Eco-efficiency (global)

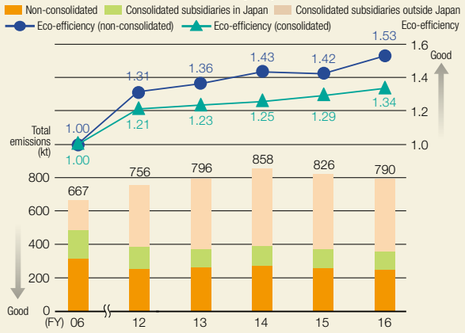
1.34 (FY06 = 1.00)

FY16 target: 1.27 (FY06 = 1.00)

Under the Fifth Plan, we set out to achieve a target of reducing total non-consolidated CO_2 emissions from production activities by 18% in fiscal 2016 compared with the fiscal 2006 level. In fiscal 2016, we attained a 22% reduction, exceeding the specified target, by saving power during summer and reducing peak power load, which continued from fiscal 2012, and by promoting joint activities among the manufacturing, production engineering and environment departments to reduce the amount of air used in production activities. As for the global eco-efficiency target of 1.27 (FY06 = 1.00), we made various efforts and attained a result well above the target. In the future, we will enhance activities toward achieving our new targets for fiscal 2021.

Initiatives for Establishment of a Low-Carbon Emission Society

CO_2 Emissions (Non-consolidated/Consolidated subsidiaries in and outside Japan)



Reducing CO_2 Emissions by Developing a Melting and Holding Furnace for Aluminum

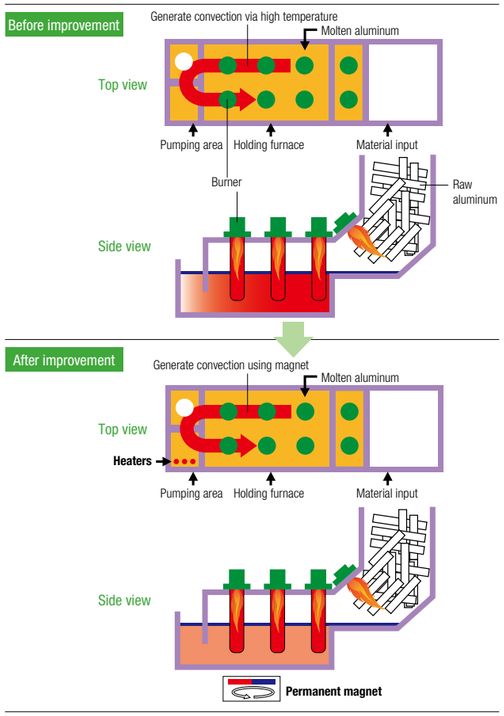
The Higashichita Plant, a production base of foundry parts and engines in Aichi Prefecture, has been working to reduce CO_2 emitted from the aluminum melting process.

Previously, a melting and holding furnace used for melting aluminum utilized thermal convection to create a unidirectional flow of molten aluminum and reduce temperature variations within the holding furnace, thus maintaining a constant quality level. However, this required an extra amount of fuel to raise the temperature to the level necessary to create thermal convection. At the same time, an increase in the generation of oxides had also caused a quality issue.

To address this problem, we developed a new melting and holding furnace that can reduce temperature variations in the holding furnace without using thermal convection. In the new furnace, the permanent magnet placed under the holding furnace rotates and generates induced electromotive force to create a flow of molten metal, while heaters added at the pumping area eliminates internal temperature variations.

As a result, the Higashichita Plant successfully cut down city gas consumption and reduced annual CO_2 emissions by about 440 tons. The generation of oxides was also reduced, leading to an improvement in quality.

Development of Melting and Holding Furnace



Summary

CO_2 Emissions from Products (Product Development)

FY2016 Results

Total emissions (non-consolidated)

17% reduction (vs FY11 level)

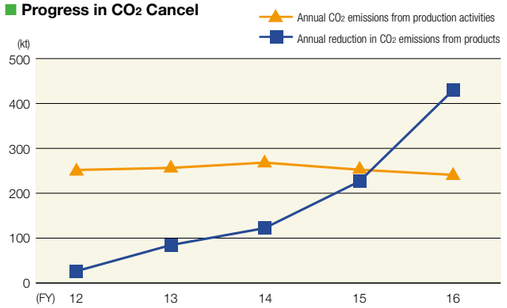
FY16 target: 10% reduction (vs FY11 level)

Under the Fifth Plan, we conducted activities to achieve a 10% reduction in CO_2 emissions from major products to be developed during the corresponding period. We succeeded in attaining this target by focusing on the development of products that satisfy the needs for increased energy savings, electrification and weight reduction based on the keywords of 3Es (Energy, Environmental protection and Ecological thinking).

Achievement of "CO_2 Cancel"

During the period covered by the Fifth Plan, we undertook a range of activities to reduce CO_2 emissions from production activities. These included visualization of energy loss; efforts to save power and reduce peak power load; installation of LED lighting; joint activities among the manufacturing, production engineering and environment departments to reduce the amount of air used in production activities; and energy-saving efforts in back-office sections. For improving product efficiency, we have developed highly efficient electric car air-conditioning compressors, improved efficiency of materials handling equipment (fuel efficiency for internal-combustion types and energy efficiency for electric types) and developed technologies to reduce power consumption of textile machinery. In this way, each business division proactively released energy-saving products to the market. In fiscal 2016, which was the final year of the Fifth Plan, we reduced 430,000 tons in CO_2 emitted from products, greatly exceeding 244,000 tons of CO_2 emitted from production activities, thus successfully achieving the designated target.

Progress in CO_2 Cancel



Certification of Environmentally Friendly Products

Toyota Industries has been proactively promoting development and design of eco-conscious products. As part of the efforts, we launched the Environmentally Friendly Product Certification System in fiscal 2007, which certifies products that possess exceptionally high environmental performance, and have been showcasing these products to the public. With the addition of one product in fiscal 2016, a total of 19 products have obtained certification under this system in 10 years since its launch. We will continue to promote the development of eco-conscious products in the future as well.

Product Certified in Fiscal 2016

GENEO-Ecore (8FBE10 – 8FBE20) compact electric lift truck with 1.0- to 2.0-ton capacity

Key features to reduce environmental impact

The lift truck is equipped with a newly developed high-efficiency AC motor, motor driver and hydraulic control system, which lead to a significant reduction in power consumption.

Approx. 17%* lower

power consumption (Approx. 20% longer operation)

* Compared with the previous model (The percentage of reduction may vary depending on operating conditions.)

Establishing a Recycling-Based Society

With a view to establishing a recycling-based society, we have been striving to reduce resource consumption and waste generation volume.

Summary

Waste Generation Volume (Production Activities)

FY2016 Results

Eco-efficiency (non-consolidated)

1.14 (FY13 = 1.00)

FY16 target: 1.01 (FY13 = 1.00)

Eco-efficiency (non-consolidated/consolidated subsidiaries in Japan)

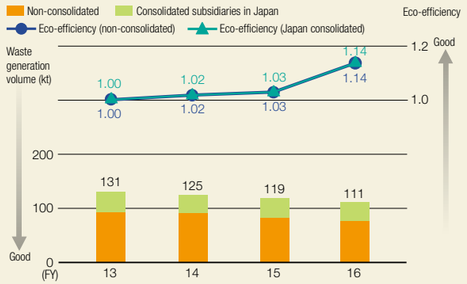
1.14 (FY13 = 1.00)

FY16 target: 1.01 (FY13 = 1.00)

In the Fifth Plan, through activities that engage our entire supply chain, we achieved eco-efficiency targets for waste generation volume both on a non-consolidated basis and for Toyota Industries and its consolidated subsidiaries in Japan. In the Sixth Plan, we will encourage effective utilization of resources, including internal reuse of waste, to attain the designated waste generation volume target per unit of production.

Initiatives for Establishing a Recycling-Based Society

■ Waste Generation Volume (Non-consolidated/ Consolidated subsidiaries in Japan)

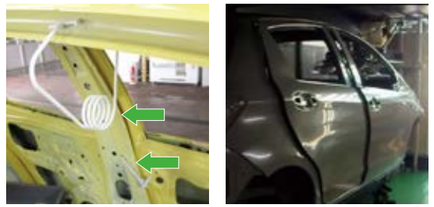


Reducing Paint Consumption with Better Coating Jigs

As part of efforts to reduce consumption of paint, the Nagakusa Plant, a production base of automobiles in Aichi Prefecture, refined coating jigs used in the automobile body painting process.

Coating jigs are attached to the automobile body to create space between the body and each door when applying paint. This space should be kept to a minimum, but conventional jigs create a rather wide gap and sometimes rub against the body, necessitating retouching. To solve the problem, a painting operator fabricated jigs by using commercially available parts and worked with a machinery manufacturer to repeatedly add modifications, finally coming up with jigs that create an 80% narrower space than conventional jigs. New jigs also offer a 10% improvement in the coating efficiency. Everyone at Toyota Industries will continue to maintain keen awareness for improvements in production activities to constantly manufacture better products.

Before improvement



After improvement

Registered utility model

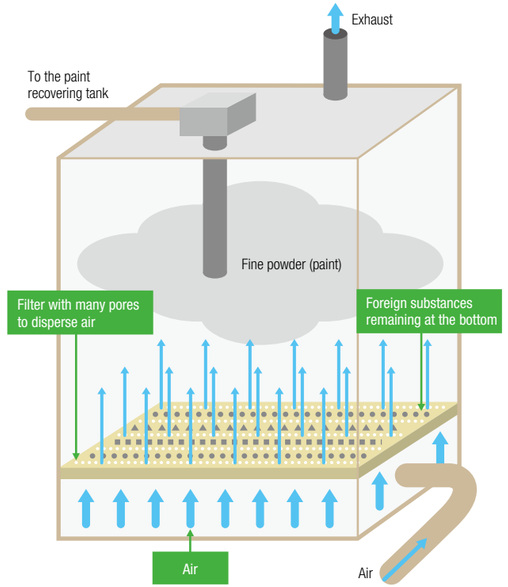
Showcasing continuous improvements on coating jigs

Reusing Paint to Reduce Waste Volume

The Takahama Plant, a production base of materials handling equipment in Aichi Prefecture, has been working to cut down its consumption of paint by creating a tank to separate the recovered paint into reusable paint and foreign substances.

A certain amount of powder paint is used to coat lift trucks. We already recover and reuse powder paint that did not settle on lift truck parts but had discarded the paint collected during the periodic cleaning of painting lines because it contained metal fragments and other foreign substances. After considering a way to reuse wasted paint, two operators teamed up to create a separation tank that uses air to separate powder paint and foreign substances. When air is sent into the box set with a pored filter, powder paint floats into the air and is recovered for reuse while foreign substances remain at the bottom of the box. They selected the optimum air pressure and diameter of the exhaust pipe through repeated tests. We have confirmed that the finished coating does not have any quality issues when using the collected paint after mixing it with new paint. As a result, the amount of paint discarded has been reduced to one-tenth of the previous amount. We believe that this device can be used for other production lines that use powder paint and will continue to expand our efforts to reduce the amount of resources used in products.

■ Separation Tank



Creators of the separation tank

Evolving *Karakuri* Pump

We have been promoting *kaizen* by *karakuri* initiatives to attain *kaizen* (improvement) by utilizing Japan's traditional, simple mechanical systems called *karakuri*, which do not require power generated by motors or other devices.

A *karakuri* pump conceived in 2013 is a case in point. As of October 2015, more than 200 units have been fielded in four of our production bases. The pump has been introduced at 10 consolidated subsidiaries and business partners as well.

One such consolidated subsidiary, Iwama Loom Works, Ltd., has devised its original *karakuri* pump, which does not require any in-house processing of parts and can be created by just assembling commercially available parts. As seen in this example, our *karakuri* pump is evolving at each company where it has been instituted.

Iwama Loom Works' *karakuri* pump evolved to eliminate parts processing

Reducing Environmental Risk and Establishing a Society in Harmony with Nature

We work to ensure the prevention of environmental incidents by fully enforcing the management of chemical substances in product development and production activities and systematically monitoring drainage systems.

Summary

VOC Emissions (Production Activities)

FY2016 Results

Emissions per unit of production (non-consolidated/automobile body)

24 g/m²

FY16 target: 24g/m²

Under the Fifth Plan, we set a fiscal 2016 target of attaining emission volume per unit of production below 24 g/m² for volatile organic compounds (VOCs) from the automobile body painting process and undertook activities accordingly. In fiscal 2016, which was the final year of the Fifth Plan, we continued our efforts to increase the recovery rate and enhance maintenance and management of thinner, a solvent used for cleaning. Consequently, emission volume per unit of production in fiscal 2016 was 24 g/m².

Status of Compliance with Environmental Laws

In fiscal 2016, there was one incident in which plant effluents exceeded standard values at a consolidated subsidiary within the Toyota Industries Group. The incident has been reported to the relevant authorities, and corrective measures have already been completed by the subsidiary concerned. Subsequent confirmations have also been made to ensure that there are no recurrences.

Toyota Industries carries out soil and groundwater surveys at its plants and performs purification when the survey results reveal that soil or groundwater contains substances exceeding standard values. We also disclose the progress of purification efforts in the corresponding *Toyota Industries Report* and at local community meetings.

In a voluntary soil and groundwater survey conducted at the Kariya Plant in Aichi Prefecture, we have confirmed that certain substances were above their standard values. We reported the incident to the Aichi prefectural government on December 22, 2015 and June 1, 2016 and disclosed the relevant information to the public.

In accordance with the results of the survey, we are implementing purification measures under the guidance of Aichi Prefecture while placing the highest priority on not to cause any inconvenience to local residents.

Measurement results are available at: https://www.toyota-shokki.co.jp/csr/environment/ (in Japanese)

Building a New Wastewater Treatment Facility Designed to Prevent External Leakage of Irregular Effluent Discharges in Case of a Disaster

At the Higashichita Plant in Aichi Prefecture, a wastewater treatment facility was situated in a location facing Kinuura Bay.

With measures against disasters, including earthquake and tsunami, becoming increasingly important, we built a new facility inland to prevent damage to and failure of the facility, which may result from disaster-induced collapse of seawalls and possible irregular effluent discharges on and off the premises.

In the new facility, treatment tanks are installed above ground, which makes it easier to inspect the exterior of the tanks and find cracks and other signs of potential leakage of irregular discharges. Moreover, these aboveground tanks have reduced the risk of effluent infiltration into the ground.

We have also raised the level of the wastewater treatment process itself by separating the plant's drainage into six routes and constantly monitoring the water quality at each route.

The lowered risk of facility failure due to disasters, including collapse of seawalls, provides an additional advantage in reducing the time required to restore production activities following a disaster.

Wastewater treatment facility

Yasuharu Arai
Group manager,
Risk Reduction Group, Environment Office,
Plant Engineering & Environment Dept.

(The position and department are as of March 31, 2016.)

We have finally completed the long-awaited relocation of the wastewater treatment facility after giving thorough consideration for ensuring early recovery after a disaster, installing treatment tanks above ground and improving the quality of wastewater treatment. We repeatedly conducted risk assessments with the relevant departments and concentrated on creating a safe, easy-to-manage facility as well as reducing environmental risks. We will continue to collaborate with the relevant departments and undertake improvements of the facility for even greater performance.

100-Day Campaign for Zero Environmental Irregularities and Potentially Serious Near-Accidents

Toyota Industries engages in awareness-raising activities to familiarize every employee with the details of environmental irregularities and potentially serious near-accidents that have occurred in the past and prevent similar incidents from occurring.

In fiscal 2016, we conducted a 100-day campaign for zero environmental irregularities and near-accidents using our original Environmental Accidental Pattern (AP) Cards*1.

During the campaign, the head of each department chose Environmental AP Cards that are most relevant to his or her departments and explained to employees the details of an incident shown on each card. Employees then created a collection of written declarations to be observed by each member as a reminder to prevent such incidents. By posting these declarations in the workplace for 100 days, we encouraged the establishment of an environment where employees caution each other, thereby raising their environmental and accident awareness.

*1: Environmental AP Cards provide an outline of and responsive action and procedures required for each incident along with points to keep in mind during the worst case scenario in which a similar incident occurs.

Separation of Drainage Systems to Prevent External Leakage of Irregular Effluent Discharges

As part of a measure to prevent external leakage of irregular effluent discharges, we have been making Company-wide efforts to separate drainage systems since fiscal 2012.

Separation of drainage systems means to discharge wastewater from production processes, initial rainwater*2, non-industrial wastewater and other rainwater off the premises after applying appropriate treatment depending on respective water qualities.

From fiscal 2015 to fiscal 2016, we conducted drainage system separation at two plants in Aichi Prefecture: the Kariya Plant, a home to the administrative departments of the Head Office as well as a development and production base of the Textile Machinery Division and Compressor Division; and the Kyowa Plant, a base for the Technology Development Department of the Head Office.

At both plants, rainwater and wastewater from production processes had been sent to the treatment facility using the same route. In separating drainage systems, we implemented the following measures.

1. Establish a route to send only the wastewater from production processes to the wastewater treatment facility
2. Install water quality monitoring equipment for rainwater to confirm that rainwater quality is suitable for release into public areas
3. Connect a drainage system of non-industrial wastewater of the Kyowa Plant to the public sewerage system

As a result, we have completed the separation of drainage systems at all plants in Japan.

*2: Rainwater at the beginning of rainfall. Contains dirt on roads and other surfaces and needs to be appropriately treated before it can be released externally.

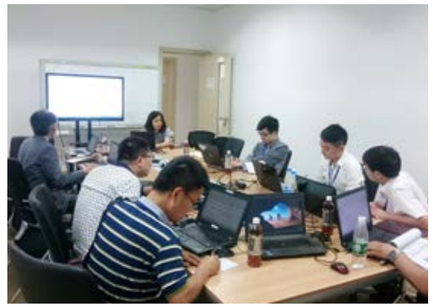
Strengthening Management of Chemical Substances

Many of the chemical substances needed for our production activities may cause adverse effects on the environment. Thus, appropriate management of chemical substances is crucial in ensuring safe handling and minimizing potential harmful effects.

To appropriately manage chemical substances contained in raw materials and products, we conducted a survey targeting 20 consolidated subsidiaries outside Japan to check the status of their management practices. Of these subsidiaries, we decided to provide relevant support to seven companies.

In fiscal 2016, we provided assistance to one subsidiary in urgent need of establishing a system to manage chemical substances.

In the future, we will provide support to the remaining six subsidiaries and continue to undertake activities to prevent violations of chemical substances regulations at production bases outside Japan.



Meeting with employees of a local production base

Post-meeting education on management of chemical substances

Environmental Management

Toyota Industries proactively discloses its initiatives for conservation of biodiversity and other environmental information.

Collaboration with the Aichi Prefectural Government's Environmental Initiative

Toyota Industries has been collaborating with the Aichi prefectural government in its initiative to foster the development of ecological networks within the entire prefecture.

In fiscal 2012, we joined the Chita Peninsula Ecological Network Council and have since been cooperating with diverse organizations, including the prefectural government, companies, NPOs, expert institutions and student organizations in promoting the creation of green zones closely linked to the local natural environment. In fiscal 2016, we joined another council, the Southern Nishi-Mikawa Ecological Network Council. We will continue to undertake initiatives that contribute to the formation of ecological networks through cooperation with other organizations.

Environmental Learning Using Our Biotope

In August 2015, we invited local children to our biotope, which we have developed and completed on Company-owned idle land in Obu City, Aichi Prefecture, and held a nature observation event to explore aquatic organisms along with the work to remove mud from the pond within the biotope. The children caught organisms living in the pond with landing nets, looked up their names in picture books and learned about non-native species as well as about the biotope itself. Some of them were delighted to see many fish in their neighborhood. We will continue to develop our biotope in the hope of contributing to conservation of the local ecosystem.

Observation event to explore aquatic organisms

Calculating Greenhouse Gas (GHG) Emissions in the Supply Chain

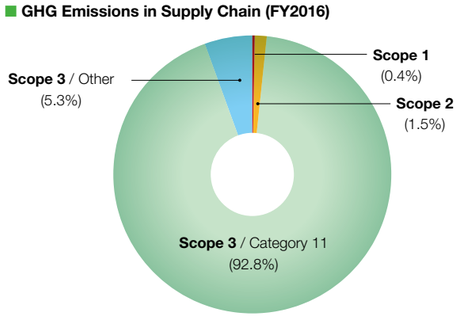
We recognize that measuring the three scopes defined by the GHG Protocol and turning the results into specific efforts to reduce CO_2 emissions are important in creating a low-carbon society. Scopes 1 and 2 are GHG emissions from our business activities, the former being direct emissions from our use of fossil fuels and the latter being indirect emissions from the use of purchased energy resulting from generation of electricity by power plants and other facilities.

Scope 3 emissions are indirect emissions associated with each product from the purchase of raw materials to end use by customers and disposal.

In the fiscal 2016 results, combined Scope 1 and 2 emissions accounted for 1.9% of the total emissions, with Scope 3 emissions reaching 98.1%. The largest source of emissions, which accounted for 92.8%, was Category 11 (Use of sold products) under Scope 3. This was because the figure included an estimate of future GHG emissions of our products (lift trucks, vehicles, engines, etc.) throughout their lifecycle (during use until disposal).

Going forward, we will continue to monitor GHG emissions within the entire supply chain and accordingly promote CO_2 emissions reduction activities.

GHG Emissions in Supply Chain (FY2016)



Emissions from Toyota Industries' business activities	Scope 1	Direct emissions from Toyota Industries through the use of fossil fuels, etc.
	Scope 2	Indirect emissions from the use of purchased energy resulting from generation of electricity by power plants, etc.
Emissions other than from Toyota Industries' business activities	Scope 3	Emissions associated with purchase of raw materials, end use of Toyota Industries' products by customers and disposal of products

Detailed data is available at:
http://www.toyota-industries.com/csr/environment/seisan/scope3.html

Proactive Disclosure of Environmental Information

Toyota Industries fosters environmental communication with our stakeholders through proactive disclosure of environmental information. In fiscal 2016, Toyota Industries obtained the disclosure score of 91 (against the full score of 100) and was evaluated to be in the performance band of C in the CDP* climate change survey.

Since fiscal 2015, we have been participating in the Ministry of the Environment's project for the establishment of a framework for disclosure of environmental information and examining the ideal way to disclose our environmental information. We will continue to upgrade our method of disclosure and contents to be disclosed.

* An international NGO undertaking a project through collaboration among institutional investors to call for disclosure of strategies against climate change issues and GHG emissions data to leading companies around the world

Activity Examples of Consolidated Subsidiaries (Outside Japan)

India

Tree-Planting Event Held during Environment Month

Kirloskar Toyota Textile Machinery Pvt. Ltd. (KTTM)
Subsidiary producing textile machinery

During Environment Month in June 2015, KTTM hosted various events to raise employees' awareness of environmental conservation. At one such event, employees planted trees on the company premises. This event is aimed at nurturing a truly natural (not man-made) forest by identifying indigenous trees, growing saplings and performing mixed and dense planting of primary species of trees. In this way, KTTM has already planted 5,000 saplings on its 1,600 m^2 land. KTTM plans to conduct this tree-planting activity on a periodical basis.

Planting an indigenous tree

Italy

Installation of Zero CO_2 Lighting

L.T.E. Lift Truck Equipment S.p.A. (LTE)
Subsidiary producing materials handling equipment parts

Based on the Toyoda Precepts and Toyota Industries' Vision 2020, LTE has been engaging in a number of activities with a focus on respect for the planet, such as reducing GHG emissions and promoting recycling.

When introducing new equipment, LTE conducts a thorough energy survey in accordance with ISO 50001 guidelines and environmental zero-impact measures before purchasing equipment with optimum performance.

LTE has also replaced lights of all plants with LED lighting to reduce electricity consumption.

Looking ahead, LTE plans to install a rooftop photovoltaic system to supply power to a certain portion of its lighting system, which is expected to reduce CO_2 emissions by 1.32 tons per year. As a result of these and other environmental initiatives, LTE obtained ISO 50001 certification in December 2014 and attained good results in the renewal evaluation held in December 2015.

Germany

Reducing Environmental Risks by Improving Method to Store Waste Oil

TD Deutsche Klimakompressor GmbH (TDDK)
Subsidiary producing car air-conditioning compressors

TDDK made improvements to the storage of waste oil leftover from production. Previously, this oil had been stored in ordinary containers with no special precautions. A thorough internal analysis concluded the waste oil to be a harmful substance because it is flammable and can pollute water. As a result, TDDK decided to install special oil storage tanks that are two-ply and equipped to prevent overfilling and leakage. Both audible and visual signals occur if spillage takes place. Improvements to the storage method brought about various benefits, including enhanced safety, fire protection and environmental protection.

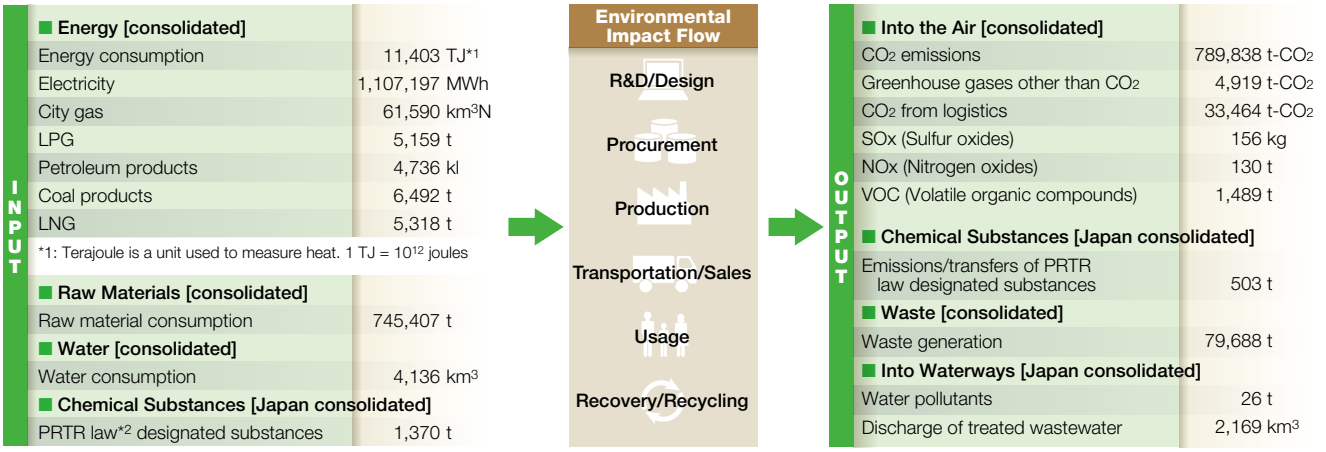
Before improvement

After improvement

Environmental Impact Flow and Environmental Accounting

In this section, we provide an overall picture of environmental impact resulting from our global business activities and report the results of environmental accounting (environmental conservation cost, environmental conservation benefits and economic benefits of environmental conservation initiatives).

Environmental Impact Flow



*2: Short for Pollutant Release and Transfer Register, the PRTR law is a scheme whereby businesses measure the release and transfer of PRTR designated pollutants and report their performance to the government. The government then compiles this data and releases it to the public.

Environmental Accounting and On-Site Verification

Fiscal 2016 Environmental Accounting*3

Scope of data collection: Toyota Industries Corporation
Period of data collection: April 1, 2015 – March 31, 2016

*3: Environmental accounting data is collected in compliance with the Ministry of the Environment's *Environmental Accounting Guidelines 2005 Edition.*

■ Environmental Conservation Cost (Millions of yen)

Category		FY2016		FY2015	
		Investment	Expenses	Investment	Expenses
Business area costs	Pollution prevention costs	525	147	944	189
	Global environmental conservation costs	716	3,156	528	4,301
	Resource recycling costs	113	193	132	160
Upstream/downstream costs		0	71	0	142
Management costs		6	166	3	221
Research and development costs		6	309	28	1,437
Social contribution activity costs		0	89	2	628
Environmental remediation costs		50	0	24	6
Total		1,416	4,131	1,661	7,084
		5,547		8,745	

■ Environmental Conservation Benefits

Environmental Impact	Comparison with Previous Fiscal Year
CO_2	5,564 t decrease
Generation of waste products	8,433 t decrease
Water	263,798 m^3 decrease

■ Economic Benefits of Environmental Conservation Initiatives (Millions of yen)

Item	Details	Amount
Revenue	Returns from sale of recycled waste products	3,850
Cost reduction	Energy cost reductions	1,169
	Cost reduction by resource savings (including reductions in amount of water use and wastewater treatment costs)	91
Total		5,110

On-Site Verification

Every year, Toyota Industries Head Office's Plant Engineering & Environment Department takes the initiative in conducting on-site verification of the accuracy and consistency of environmental data included in the *Toyota Industries Report*. The results for fiscal 2016 are as follows.

On-Site Verification Sites

Toyota Industries Corporation
- Kariya Plant (textile machinery and car air-conditioning compressors) and Nagakusa Plant

Consolidated subsidiaries in Japan
- Nishina Industrial Co., Ltd. and Tokaiseiki Co., Ltd.

Items to be Verified

1. Adequacy of the scope of data collection; validity of data collection and calculation methods; validity of internal verification
2. Trustworthiness and accuracy of collected/calculated data as well as data reported to the Head Office; accuracy of methods of reporting to the Head Office

Results

1. The verified sites retained original data (evidence) for all statistics, which were confirmed to be valid as was the method of data collection.
2. All discrepancies found during verification have been corrected after respective causes have been identified.
3. Considerations of improvements will be made for data collected using complex collection methods that may result in calculation errors.