

2012

Environmental Initiatives

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Interview An Interview with the Chief Environmental Administrator



-Our Future Energy Management-

Aiming to Build a "Smart Factory"

The shutting down of nuclear power plants following the Great East Japan Earthquake on March 11, 2011 marked a significant turning point in Japan's national energy strategy. Reflecting these circumstances, energy management has become an increasingly critical management issue for companies. We asked Masafumi Kato, Senior Managing Director and chief environmental administrator*, about Toyota Industries' future approach to energy management.

A co-generation system simultaneously produces Feature

electricity and heat from natural gas and other fuel sources. With the capability to effectively reuse the generation is considered as one promising option for Toyota Industries' future energy strategy.



Exterior of co-generation facility (Kariya Plant, Aichi Prefecture)

Looking Back on Initiatives in Fiscal 2012

The nuclear power plant outage following the Q massive earthquake resulted in a tight power supply in Japan. In the Chubu region where Toyota Industries' plants are located, power savings also became an urgent task as the nuclear reactors at the Hamaoka nuclear power plant were temporarily shut down. How do you sum up the initiatives undertaken during this period?

Kato: Toyota Industries consumes a considerable amount of energy in its business activities, and we naturally regarded the task of saving power as a key responsibility. In fiscal 2012, we defined a target of reducing our peak electricity consumption by 5% year-on-year and made Company-wide efforts to save power. We needed to do everything we could.

Firstly, we introduced weekend shifts along with other companies in the entire automobile industry. We then implemented a broad range of power-saving measures at our plants and offices. All employees made concerted efforts to successfully achieve targets and fulfill our responsibility to society.

Examples of Our Power-Saving Efforts

Power Saving through the Introduction of Weekend Shifts

During the summer of 2011, the entire auto industry in Japan worked Saturdays and Sundays and took Thursdays and Fridays off in order to save electricity and help power companies reduce peak power load.



Preparation for Power-Saving Request under **Emergency Supply-Demand Adjustment** Contract with CHUBU Electric Power Co., Inc.

Created a prioritized list of equipment to shut down when a power-saving request is made from the power company in case of tight supply, and developed standardized shutdown procedures.

Conducted training on equipment shutdown using the standardized procedures to ensure power is saved as requested.

Do you feel employees' energy consciousness has changed through these initiatives undertaken during fiscal 2012?

Kato: Yes, it has. But from now on, we must do more than just saving electricity. We need to redefine our energy strategy itself. Before the earthquake, we had focused on the kind of electrification beneficial in terms of both costs and CO₂ emissions factor for electricity*. After the earthquake, we began to reconsider a more flexible energy management system that does not rely on a single energy source.

* Amount of CO₂ emitted to generate a unit of electricity

Future Energy Strategy

What energy strategy is Toyota Industries considering for the future?

Kato: In the future, we must manage energy wisely. That is, we must wisely generate, wisely use and wisely store energy. Construction of a "smart factory," which applies this way of thinking to energy management at plants, is something we should pursue. This entails building a



mechanism to efficiently and alternately supply renewable energy and energy produced by a highly efficient power generation system in accordance with varying levels of demand within a plant.



What specific steps should be taken?

Kato: The first step is to wisely generate energy. At Toyota Industries, this will involve the use of co-generation systems, renewable energy sources and biomass. We will begin with expanding the use of co-generation systems.

In our previous efforts to promote electrification, we had a plan to eventually reduce the use of co-generation systems, as these offered less advantage in lowering CO₂ emissions. Following the turning point, however, we conducted an assessment from a more comprehensive

viewpoint, covering such areas as less CO₂ emissions, reduction of peak power consumption, energy savings and disaster prevention (use as an emergency power source). The results revealed that co-generation systems do provide sufficient advantages, and we have made a drastic shift in our energy policy.

Co-generation systems also offer excellent energy efficiency because we can use these systems when necessary and utilize their waste heat to produce steam and hot water.

Nevertheless, I believe that the use of renewable energy sources will be the key enabler for our approach to wisely generating energy.

Keeping pace with the general trend toward the increased use of renewable energy, we will introduce and expand the use of solar and wind power as important energy sources while paying close attention to technological developments.

We are also switching from fossil fuels to biomass fuels. As part of this effort, we started using biocoke, a solid biomass fuel, in fiscal 2012. (See page 66 for more details.)

In addition, we are also keeping our eves on the development of a new energy generated by using waste heat.



Envisioned Image of "Smart Factory"



How will Toyota Industries wisely use the resulting energy?

Kato: Changes in energy supply sources will likely entail more complex energy management at plants. For instance, renewable energy is weather dependent, whereby the supply amount fluctuates with changes in weather conditions. Also, an optimum supply source may vary depending on where power is used within a plant. Wisely using energy means to find an optimum combination of energy sources and maximize the advantages of each.

Currently, on-site supervisors determine how we use energy based on the production status and other factors. An increase in available energy options entails more complex management, and manual control is limited in achieving reductions in CO₂ emissions and costs. It is imperative that we set up a system to totally manage energy use in each facility.

Wisely using energy is possible when we build a system that can save energy by automatically selecting the optimum energy source based on weather conditions, production status and other input data.



Light duct and light control system (Takahama Plant, Aichi Prefecture)





Solar power generation and wind power generation (Technical Learning Center, Aichi Prefecture)

To use electricity when necessary, it will be important to wisely store electricity.

Kato: Yes. The word "storing" reminds us of electricity storage technology. But fuel cells, which are capable of generating electricity anywhere, can also be regarded as an effective means to wisely storing energy. We have been conducting a feasibility test of fuel-cell lift trucks with an eye to using them as another source of electricity.

By combining technologies to wisely generate, wisely use and wisely store energy, we will work to build an optimum energy management system and realize a "smart factory."



Fuel-cell lift truck





Solar power generation (TD Deutsche Klimakompressor GmbH*, Germany) * A subsidiary producing car air-conditioning compressors.

Vision for Environmental Activities

Structure to Implement Environmental Management

Toyota Industries works with consolidated subsidiaries in and outside Japan to promote environmental activities on a global scale. We aim to realize a prosperous life in harmony with the natural environment through the establishment of a sustainable society.

Positioning environmental response as one of its most crucial management issues. Toyota Industries is enhancing its environmental governance through the promotion of consolidated environmental management.

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, we established the Global Environmental Commitment, a specific environmental action guideline, to be shared and implemented throughout the Toyota Industries Group.

We will dedicate Group-wide efforts to realizing a prosperous life in harmony with the natural environment by carrying out activities aimed at "establishing a low-carbon emission society." "establishing a recycling-based society" and "reducing environmental risk and establishing a society in harmony with nature" as our way of "promoting environmental management."

Working toward "CO₂ Cancel"

"CO2 Cancel" is Toyota Industries' original concept that aims to offset CO₂ emissions from production activities at plants by reducing CO₂ emissions via improved product efficiency and other means. We have adopted this approach as a new environmental target under the Fifth Environmental Action Plan that covers the period from fiscal 2012 to fiscal 2016.

[Establishment of Original Standards]

In fiscal 2012, we developed an original approach to apply to products with different features to calculate CO₂ reduction volume for each product.

[Future Activities]

The shutting down of nuclear power plants is likely to induce a change in the CO₂ emission factor for electricity and a considerable fluctuation in production volume in Japan as we shift production operations to overseas bases. From fiscal 2013 onward, we will clarify our target of when to accomplish "CO2 Cancel" based on these changes and promote activities accordingly.



Notional Diagram of Global Environmental Commitment



Notional Diagram of "CO2 Cancel"

- CO₂ emissions from production activities = Total CO₂ emissions from Tovota Industries' plants
- Reduction of CO₂ emissions via improved product efficiency = Total reduction in CO₂ emissions attained by major products which are manufactured at Toyota Industries' plants

Steps to Accomplishing "CO2 Cancel"

- 1 Establish parameters to calculate CO₂ reduction volume for each product
- 2 Provide an estimate of when to accomplish "CO2 Cancel" based on the results of preliminary calculations
- 3 Specify targets (including when to accomplish "CO2 Cancel")
- 4 Promote activities to achieve these targets
- 5 Achieve these targets
- 6 Define higher targets (e.g., "CO₂ Double Cancel")

Status of Our Environmental Management System

Toyota Industries has positioned environmental response as one of its most crucial management issues. To guickly 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.

We have also assigned the positions of responsible internal auditor and chief environmental administrator, two key roles in our EMS, to executives, in an effort to strengthen governance from an environmental perspective.

Environmental Management Structure



Scope of Group-Wide Environmental Management (As of March 31, 2012)

Non-production companies Japan: 24 Outside Japan: 92

North America

Production companies: 8

The Raymond Corporation (U.S.A.)

Raymond-Muscatine Inc. (U.S.A.)

North Vernon Industry Corp. (U.S.A.)

Cullman Casting Corporation (U.S.A.)

Toyota Industrial Equipment Mfg., Inc. (U.S.A.)

Indiana Hydraulic Equipment, Corp. (U.S.A.)

Michigan Automotive Compressor, Inc. (U.S.A.)

TD Automotive Compressor Georgia, LLC (U.S.A.)

Europe Production companies: 5 BT Products AB (Sweden Toyota Industrial Equipment, S.A. (France) CESAB Carrelli Elevatori S.p.A. (Italy) L.T.E. Lift Truck Equipment S.p.A. (Italy) TD Deutsche Kl

Asia



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 2012 revealed seven non-conformances. We have already completed measures to correct them and disseminated the relevant information to other plants to prevent recurrence.

As for internal audits, we were able to reduce the average number of non-conformances per department from 0.86 in fiscal 2011 to 0.77. To improve the quality of internal audits, we are undertaking efforts to develop the capabilities of auditors by conducting education programs such as introductory courses for environmental management and environmental audits. As a result, the number of internal auditors increased to 110 as of March 31, 2012.

Human Resources Development

As one task under the Global Environmental Commitment, our basic policy concerning environmental activities, we have been undertaking efforts to foster the development of environmental specialists who can think and act on their own for the environment. In doing so, we have clarified the environment-related knowledge and skills required for each job category and rank, and accordingly, built an environmental education program.

We designate every June as Environment Month and engage in various activities, such as holding environmental events and running articles on environment-related topics in our in-house newsletters to raise environmental awareness among employees as well as their families.

Production companies: 4

TD Automotive Compressor Kunshan Co., Ltd. (China Toyota Industry (Kunshan) Co., Ltd. (China) Kirloskar Toyoda Textile Machinery Pvt. Ltd. (India) Zheijang Aichi Industrial Machinery Co., Ltd. (China)

Japan

Non-consolidated: 10 plants Production companies: 14 Aichi Corporation (Saitama) TIBC Corporation (Aichi) Altex Co., Ltd. (Shizuoka) IZUMI MACHINE MFG, CO., LTD, (Aich Iwama Loom Works, Ltd. (Aichi Tokaiseiki Co., Ltd. (Shizuoka) Tokyu Co., Ltd. (Aichi) Nagao Kogyo Co., Ltd. (Aichi) Miduho Industry Co., Ltd. (Aichi) Nishina Industrial Co. 1 td. (Nagano) HANDA Casting Company (Aichi) Unica Co., Ltd. (Aichi) Hara Corporation (Gifu) Mino Tokyu Co., Ltd. (Gifu)

Fifth Environmental Action Plan

Under the Fifth Environmental Action Plan (fiscal 2012 - fiscal 2016), we will strive to upgrade our environmental management and actively promote initiatives to achieve fiscal 2013 targets.

Progress in the 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 have devised the Fifth Environmental Action Plan for the period from fiscal 2012 to fiscal 2016, promoting activities according to the plan.

Establishing a Low-Carbon Emission Society

Commonto	Action Delicios/Crossific Actions		FY2013 Targets					FY2012 Achievements		
Segments	Action Policies/Specific Actions		Subject		Scope	Control Items	Base Year (FY)	Targets	Achievements	Page
	Reduce CO ₂ emissions by 10% ^{*1} from major products to be developed during the period covered by the Fifth Plan									
In the Automobile-Related Business, promote electrification and develop technologies and products that will contribute to reduction of CO emissions •Develop technologies to respond to electrification of vehicles •Improve energy efficiency of car air conditioner •Develop technologies to enable weight reduction			-2						 <automobile-related business=""></automobile-related> Developed highly efficient variable- displacement compressor Developed highly efficient electric compressor Developed the world's largest*³ panoramic roof made of plastic glazing <materials business="" equipment="" handling=""></materials> Developed energy-efficient electric lift 	
	In the Materials Handling Equipment Business, develop technologies and products that will contribute to reduction of CO2 emissions •Reduce energy loss in electric-powered lift trucks In the Textile Machinery Business, develop								 Textile Machinery Business> Developed energy-efficient, resource- saving electronic shedding device for air-jet looms 	
	technologies and products that will contribute to reduction of CO ₂ emissions •Reduce energy loss									P66/67
	Promote energy reduction and energy conservation through innovative production			Non- consolidated Global		Total emissions	1991	-10% (FY09-13 average)	-17%	
	technologies •Promote visualization of energy loss •Further promote Company-wide reduction	со	2 emissions					1.15	1.27	
Production	activities and accelerate thorough, horizontal deployment	•Er de	nergy- erived CO2 gases*4		Non- consolidated			1.32	1.43	
	Develop innovative technologies to reduce CO2 emissions	•CC	Õ2 from gistics		Consolidated subsidiaries in Japan	Eco-efficiency*5	2006	1.02	1.11	
	 Promoting measures to curb global warming Promote horizontal deployment of technologies to curb global warming 	5			Consolidated subsidiaries outside Japan			1.05	1.22	
Logistics	Reduce CO ₂ emissions through green logistics •Promote modal shift •Produce the number of transportation vehicles] [CO2 from	No	on-	Total emissions	1991	-15%	-37%	
LOGISTICS	by promoting mixed transport among business		logistics	cc	onsolidated	Eco-efficiency	2007	1.06	1.24	

Establishing a Recycling-Based Society

ſ	Sogmonto				FY2013 Targets	FY2012 Achievements					
	Seyments	Action Folicies/Specific Actions	Subject Scope		Control Items	Base Year (FY)	Targets	Achievements	Page		
	Products	Implement initiatives to promote 3R (reduce, reuse and recycle) design for effective resource utilization	*2						Developed resource-saving DC-DC converter Developed energy-efficient, resource-		
		•Reduce use of resources through weight and size reductions					saving electronic shedding device for air-jet looms				
		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	Packaging Non- naterial volume consolidated		Eco-efficiency	2007	1.06	4.10	P68	
	Draduation		Waste generation	In Japan				1.13	1.61		
	Production				Non- consolidated	Eco-efficiency	2006	1.12	1.20		
					Consolidated subsidiaries			1.16	2.54		

In fiscal 2012, which marked the first year of our five-year plan, we were able to exceed targets for fiscal 2013.

In fiscal 2013, we will start defining even higher targets for fiscal 2016 with a view toward further reducing environmental impact while working to attain the targets for fiscal 2013.

Reducing Environmental Risk and Establishing a Society in Harmony with Nature

Cogmonto	Action Policies/Specific Actions			FY2013 Targets	FY2012 Achievements			
Seyments	Action Policies/Specific Actions	Subject	Scope	Control Items	Base Year (FY)	Targets	Achievements	Page
	Reduce emissions to improve air quality in urban areas in all countries and regions •Develop engines that meet future regulations						Developed diesel engines with low emissions	
Products	Manage chemical substances contained in products • Investigate chemical substances contained in products and manage switching over of SVHC* ⁶ and other substances of concern to other substances			*2	Held training seminars for business partners for creating substances of concern database			
Production	Further reduce emissions of substances of concern •Reduce emissions of substances of concern mainly from painting processes Minimize environmental risks •Expand the use of a preliminary review system •Reduce risks related to wastewater •Enhance risk communication with relevant organizations and local residents	VOC ⁺⁷ emission	Non- consolidated (automobile body)	Emission volume per unit of sales	_	24 (g/m²)	25 (g/m²)	P69

Promoting Environmental Management

Commonto	Action Dolicios/Crossific Actions	FY2013 Targets				FY2012 Achievements		
Seyments	Action Policies/Specific Actions	Subject	Scope	Control Items	Base Year (FY)	Targets	Achievements	Page
	Reinforce CO ₂ reduction activities for "CO ₂ Cancel" •Further reduce CO ₂ emitted from production activities in plants •Reduce CO ₂ emissions by achieving improved efficiency in newly developed products Aim to cancel out CO ₂ emissions of Toyota Industries through these two activities						•Duly considered the definition of "CO2 Cancel" and established the parameters to calculate CO2 reduction volume	P62
	Augment and promote consolidated environmental management •Build a global environmental management system and promote related activities to: - Comply with environment-related laws and reduce environmental risks in each country - Achieve the highest-level performance in each country						 Held meeting for consolidated subsidiaries in Japan Disseminated information regarding plant-related laws and regulations Confirmed compliance through check sheets 	P63
General	Enhance and promote environmental education and enlightenment activities •Develop environmental specialists to lead internal environment-related activities		*8				Held lecture on the environment Introduced internal eco-point system	
	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						•Won the best award at the Aichi Green Curtain Contest for wall greening activities •Introduced super environmentally friendly products on website	
	Augment activities related to protection of biodiversity •Identify the impact of business activities on biodiversity and reinforce initiatives by defining specific goals						 Promoted plan for establishing a biotope 	P70/71
	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						 Formulated mid- to long-term energy strategies 	

*1: Target products Toyota Industries develops and produces. The CO₂ reduction volume is calculated based on the method Toyota Industries determined using FY2011 levels as the baseline.

- *2: Details undisclosed due to confidential information and other reasons
- *3: As of March 31, 2012; survey by Toyota Industries
- *4: Greenhouse gases other than CO2, including methane (CH4), dinitrogen monoxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SFe) *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: Substances of Very High Concern *7: Volatile Organic Compounds
- *8: Specific targets are set separately and progress achieved is disclosed via the Company Website or Toyota Industries Report and other media.

Establishing a Low-Carbon Emission Society

We position the establishment of a low-carbon emission society as one of our most crucial environmental tasks. We have been working to reduce CO₂ emissions by improving product efficiency through technological innovation, encouraging energy saving and less consumption of energy during production activities and promoting green logistics.

Internal Award Program to Recognize Environmental Improvement Activities

In fiscal 2011, Toyota Industries established an internal award program to recognize excellent environmental improvement activities undertaken at production sites and offices. The program's purposes are to share best practices to raise the level of environment-related activities throughout the Company.

In fiscal 2012, with the intent to further motivate employees to take action, we reviewed the system to assess the process of activities from a broader perspective. We received applications from each business division such as measures to reduce CO₂ emissions and save power. Four projects were selected to receive either a "Best Practice Award" or "Excellent Practice Award."

We will continue to refine our award program to encourage more environmental improvement activities and contribute to the generation of excellent ideas.



On-site assessment



Internal Award Program: Best Practice Award

Reduction of CO₂ Emissions through Introduction of Biocoke

The Engine Division accounts for 37% of Toyota Industries' total CO₂ emissions generated, with its main emission source being the incineration of coal coke in the cast iron melting process.

In order to reduce CO₂ emitted from the melting process, the Engine Division rolled out an initiative to replace coal coke with biocoke, which has a zero CO₂ emissions factor.

In fiscal 2012, which was the first year of the initiative, we aimed to replace 4% of coal coke with biocoke and to reduce annual CO₂ emissions by 500 tons.

Biocoke is a solid biofuel produced by heating and compressing biomass such as wood chips from thinned trees or tea grounds thrown away by beverage manufacturers. It is an excellent fuel substitute because of its carbon neutrality*, but provides less heating power for the melting process and a lower amount of carbon needed in the resulting molten metal compared with coal coke, making it difficult to maintain the quality of our products.

To compensate for the insufficient heating power, we increased the amount of biocoke used in the melting process. To solve the problem of an insufficient amount of carbon, we added petroleum coke, which contains roughly the same amount of carbon as coal coke, and determined the optimal mix through a number of operational tests.

These efforts resulted in a reduction in annual CO₂ emissions by 650 tons, which exceeded the target.

* Carbon neutrality refers to the concept that the amount of CO₂ generated by incinerating a plant is offset by the amount of CO₂ absorbed by the plant through photosynthesis in the process of its growth, thus causing no increase/decrease in the amount of CO₂ in the atmosphere.

Production of Biocoke



Internal Award Program: Best Practice Award

Reduced Airflow in Vehicle Painting Line to Reduce Energy Consumption

In a vehicle painting line, we generate a downward airflow at a constant speed to prevent unnecessary dispersion of the sprayed paint.

We worked to reduce the amount of airflow in order to reduce energy consumption.

We first moved the spray nozzles closer to the vehicle body and adjusted the discharge pressure and amount to reduce dispersion. We then set the amount of airflow at a level sufficient to prevent the paint from being sprayed on the next vehicle body on the line, thereby reducing the amount of airflow by about 60%.

Consequently, we successfully reduced annual CO₂ emissions by approximately 270 tons.



Applying the minimum required amount of downflow and still being able to maintain the level of quality

New Electronic Shedding Device with Excellent Energy-Saving Performance

An air-jet loom electronic shedding device creates a vertical space between the raised and lowered warp threads through which to insert weft yarn. It allows the weaving of complex-patterned fabrics by controlling the timing of the raising or lowering of warp threads.

In May 2011, Toyota Industries developed a new electronic shedding device that offers an excellent energysaving feature while maintaining the same level of weaving performance as conventional electronic shedding devices.

This new device is equipped with an improved decelerator and motor, which improves performance during high-speed operation. At the same time, by recovering energy generated in the deceleration process, power consumption of the new device has been reduced by more than 10%.



JAT710 air-jet loom equipped with the optionally available electronic shedding device



vironmental Initiatives Establishing a Low-Carbon Emission Sc

Establishing a Recycling-Based Society

With a view to contributing to the establishment of a recycling-based society, we have been reducing our resource consumption through the promotion of 3R (reduce, reuse and recycle) design and improvement of resource productivity.

Internal Award Program: Excellent Practice Award

Recovery and Reuse of Steam Drainage Water*1 from Washing Equipment

Toyota Material Handling Japan (TMHJ), responsible for Toyota Industries' Materials Handling Equipment Business, reduced the amount of water used in the pre-paint washing process.

Previously, steam was used to heat washing water to maintain its temperature at a constant level. Drainage water liquefied from used steam had been disposed of as wastewater. However, the results of a water quality analysis revealed that this drainage water retained the level of quality suitable for use as washing water. TMHJ consequently decided to recover and reuse it as washing water.

This helped TMHJ reduce annual consumption of water provided by public water supply by about 4,000 m³. As hot recycled water of approximately 80°C is added to the washing water, less steam is required for the heating process, leading to a reduction in annual CO₂ emissions by about 50 tons.

*1: Hot water liquefied from steam, which occurs when heat is removed from steam in the heating process

Greater Resource Efficiency for DC-DC Converters

A DC-DC converter is primarily used on hybrid vehicles (HV) to downconvert the high voltage used for the drive motor to a level suitable for operating lights, wipers, horns and other auxiliary devices.

In December 2011, we developed an approximately 44% lighter DC-DC converter with smaller components and fewer parts compared with our existing DC-DC converters. A fewer number of fastening screws resulted in an easier-to-dismantle structure, contributing to higher recycling efficiency. The new DC-DC converter is fitted in the Aqua (Prius c in North America), a hybrid vehicle by Toyota Motor Corporation.



Reduction of Waste by HANDA Casting Company

HANDA Casting Company, a consolidated subsidiary in Japan that produces foundry parts for lift trucks, reduced the amount of waste generated in the shot blasting process used to apply surface treatment to counterweights*2.

Used blasting sand generated from this process contains pulverized steel shots (pieces of iron) or iron powder. Because of these contents, it was not suitable for recvclina.

In fiscal 2011, through a joint project with a manufacturer. HANDA Casting succeeded in separating these impurities from used blasting sand and reduced the annual amount of waste by approximately 480 tons. *2: A weight installed in the rear of a lift truck to maintain balance with the cargo load



Initiatives for Establishing a Recycling-Based Society



Reducing Environmental Risk and Establishing a Society in Harmony with Nature

We have been striving to reduce emissions of substances of concern by implementing thorough management of chemical substances in product development and production activities.

Internal Award Program: Excellent Practice Award

Environmental Improvement through Adoption of a New Piston Coating Method

We apply resin coating to pistons, a car air-conditioning compressor part, to ensure smooth piston movement and airtightness.

The conventional method, which sprays resin on the entire piston, causes resin to spread and settle on unnecessary portions of the piston and on jigs, using more resin and energy than necessary.

In 1998, we started introducing a roll coating method that uses rollers to transfer resin onto a piston surface. This method only applies coating where necessary, resulting in the reduction of the required amount of resin and thus the usage of chemical substances.

By fiscal 2012, we adopted the roll coating method in all our 14 coating lines. Compared with the conventional spraying method, annual VOC (volatile organic compound) emissions were reduced by about 249 tons and annual emissions of PRTR (Pollutant Release and Transfer Register) law designated substances decreased by approximately 42 tons.

A reduction in air consumption and elimination of drying furnaces also reduced annual CO2 emissions by about 4,600 tons.



Study Sessions for Business Partners on Management of Chemical Substances

Toyota Industries uses a chemical substance management system to accumulate data on materials used and chemical substances contained in all of its products for the purpose of confirming applicability when new regulations come into effect in a country or region.

An appropriate applicability check requires compilation of accurate data. Since fiscal 2007, we have been carrying out activities to help our business partners that create their own databases to understand the importance of chemical substances management and holding study sessions on how to compile accurate data

These activities have proven effective in raising awareness for the proper management of chemical substances



Study session for business partners

among business partners throughout our supply chain and been contributing to the establishment of a safe society not affected by any harmful substances.

Soil and Groundwater Pollution Countermeasures

Toyota Industries carries out surveys and purification of soil and groundwater contaminated from the past use of trichloroethylene. We regularly report the survey results to local government authorities and provide information at local community meetings. As measures to prevent pollution from substances covered by the Soil Contamination Countermeasures Law as well as from grease and oils, we have drilled observation wells at all plants to conduct regular checks.

Trichloroethylene Readings

Plant	FY2008	FY2009	FY2010	FY2011	FY2012
Kariya Plant	0.99	0.67	0.67	0.41	0.38
Kyowa Plant	0.79	0.72	0.34	0.41	0.48

Weighted average concentration in groundwater (mg/l)

Status of Compliance with Environmental Laws

In fiscal 2012, there was one instance in which effluents from the plant exceeded standard values at one subsidiary within the Toyota Industries Group. This 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.

We will step up our efforts to prevent environmental risks by sharing information on environment-related incidents throughout the Toyota Industries Group, including their causes and countermeasures taken. We will also continue to augment Group-wide efforts to minimize environmental impact by conducting contingency training for emergency situations and other proactive measures.

Environmental Management

Toyota Industries promotes the development of human resources capable of taking their own initiative regarding the environment in order to carry out activities specified under the Fifth Environmental Action Plan and achieve its targets.

Eco Character **ECOROP**

"ECOROP" is our corporate eco character selected from 112 character designs solicited from employees. A water droplet and leaves symbolize the environment, and the word "ECO" is positioned on its forehead to resemble our corporate logo.



In addition to Company-wide events, individual plants held various events, and many employees have joined the eco-point program.

According to the results of a guestionnaire on this program, approximately 85% of Toyota Industries' employees responded that they have become more environmentally aware through these activities.

We will carry out continuous activities to maintain employees' interest in environmental issues and encourage them to take environment-conscious actions both in the workplace and at home.

We will also work to refine the program to contribute to the conservation of the environment in surrounding areas.

Voice of Program Organizer

We have rolled out this program to encourage employees and their families to take environment-conscious actions with a sense of enjoyment. We will continue to plan events and activities in which they can participate easily to help each person increase his or her environmental awareness



Program organizers in the Plant Engineering & Environment Department handing out leaflets to promote the eco-point system

Lecture on the Environment





Workshor

In fiscal 2012, we

invited Mr. Ukyo Katayama, formerly an F1 driver and now an alpinist, as a lecturer, and Professor Noriyasu Kunori of Toyama Prefectural University as an interviewer to talk about what everyone can do now for the environment. About 170 employees attended the lecture.

Mr. Katavama spoke about matters such as what made him think about environmental issues and how he decided to take personal action in his everyday life.

A workshop was held at the end of the lecture, and each participant wrote down on paper a personal declaration of one environmentally friendly action each will take. We pasted these sheets together to create the shape of a tree and named it Kizuki-no-Ki (a tree of small realizations). Some participants declared that they would strive for eco-driving and others decided to be a role model for their children. Through this workshop, we

realized that everyone's small actions will become a big force in protecting the environment.



Kizuki-no-Ki made up of participants' declarations

Wall Greening Activity Received the Best Award in Aichi Green Curtain Contest

For the purpose of saving electricity during the summer and raising the environmental awareness of employees, the Kariya Plant (Aichi Prefecture) carried out a "wall greening" project to grow a shady "green" curtain, seven meters high and 90 meters wide, to cover a wall of its office building.

In June 2011, about 200 employees participated in an event to plant morning glory seedlings. We devised ways to continuously gain employees' attention, including posting records of the morning glories' growth on the Intranet, thereby successfully raising their environmental awareness. The curtain of morning glories effectively reduced the amount of electricity used by air conditioners by about 10%.

This project was highly praised by external organizations and received the Best Award in the Factory Category in the Aichi Green Curtain Contest sponsored by Aichi Prefecture.

We will continue this wall greening project, extending activities to other plants.



Employees planting morning glory seedlings

Introduction of Internal Eco-Point System

To raise environmental awareness among employees and their families, Toyota Industries introduced an internal eco-point system in April 2011. Under the slogan "Let's lead a more ecological lifestyle," the program gives ecopoints to employees and their families who make improvement proposals for protecting the environment or participate in lectures and other environmental events. These points can be exchanged for eco-friendly products.

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Activities in Fiscal 2012 (Examples)



tricity" event (Nagakusa Plant, Aichi Prefecture



Water sprinkling activities to lower surface temperature (Kariya Plant, Aichi Prefecture)

TIEM Received Environmental Award

Toyota Industrial Equipment Mfg., Inc. (TIEM), a U.S.based subsidiary producing lift trucks, was awarded The 2011 Indiana Governor's Award for Environmental Excellence.

This award is given to companies carrying out business activities and decision-making based on excellent environmental strategies. TIEM, recognized for its numerous achievements through five years of continuous environmental improvement activities, received this award for the third time.

Results of TIEM's Five-Year Environmental **Improvement Activities**

Achievements included reducing VOC emissions by 55%, air pollutant emissions by 34%, industrial waste generation by 62% and water consumption by 24%



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	_]			
INPUT		Env	ironmental Impact Flow	V	OUTPUT	
Energy [consolidated]	Total consumption 9,800 TJ*1 Electricity 980,640 MWh City gas 77,977 km³N LPG 4,105 t Petroleum products 5,178 kl Coal products 6,346 t LNC 5,70 t		R& <u>D/Des</u> ign Procurement		Into the Air [consolidated]	CO2724,338 t-CO2 Greenhouse gases other than CO23,329 t-CO2 CO2 from logistics34,028 t-CO2 SOX (Sulfur oxides)
	*1: Terajoule is a unit used to measure heat.		Production		Chemical Substances	Emissions/transfers of PRTR law designated substances 781 t
Raw Materials [consolidated]	Raw material consumption576,355 t	$\left \right\rangle$	Transportation/	\geq	Waste [consolidated]	Waste generation
Water [consolidated]	Water consumption6,035 km ³		Sales		[Japan consolidated]	Discharge of treated wastewater 2,510 km ³
Chemical Substances [Japan consolidated]	PRTR law* ² designated substances1,726 t *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 diffe or delenge it to		Usage			
	government then complies this data and releases it to the public.		Recycling			

Environmental Accounting and On-Site Verification

■ Fiscal 2012 Environmental Accounting^{*3}

Scope of data collection: Toyota Industries Corporation **TIBC** Corporation

Data collection period: April 1, 2011 - March 31, 2012 *3: Environmental accounting data is collected in compliance with the Ministry of the

Environment's Environmental Accounting Guidelines 2005 Edition.

Environmental Conservation Cost

Environmental Conservation Cost (Millions of yen)						
	Cotogony	FY2	012	FY2011		
	Galegory	Investment	Expenses	Investment	Expenses	
	Pollution prevention costs	257	1,028	246	1,371	
Business area costs	Global environmental conservation costs	345	3,264	233	2,872	
	Resource recycling costs	32	721	20	562	
Upstream/downstream costs		-	49	6	4	
Management costs		263	1,231	2	1,130	
Research and development costs		3	1,260	3	152	
Social contribution activity costs Environmental remediation costs Total		-	8	4	13	
		3	9	-	9	
		903	7,570	514	6,113	
		8,4	73	6,62	6.627	

Environmental Conservation Benefits

Environmental Impact	Comparison with Previous Fiscal Year
CO2	7,735 t decrease
Generation of waste products	2,004 t increase
Water	95,934 m ³ decrease

Economic Benefits of Environmental Conservation Initiatives (Millions of ven)

		(
ltem	Details	Amount
Revenue	Returns from sale of recycled waste products	4,656
Cost reduction	Energy cost reductions	49
	Cost reduction by resource savings (including reductions in amount of water use and wastewater treatment costs)	(19)
Total		4,686

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 2012 are as follows.

[On-Site Verification Sites]

Obu Plant:	Production of car air-conditioning
	compressor parts
Morioka Works:	Production of automotive parts
Tokaiseiki Co., Ltd.:	Production of parts for car
	air-conditioning compressors
	and engines
Items to be Verifie	dì

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 reported to the Head Office

[Results]

- 1. The verified sites retained original data (evidence) for all statistics, which were confirmed valid as were the scope and 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.