

TOYOTA MOTOR CORPORATION

# Environmental Report



# Environmental Report 2011

## Editorial Policy

Considering the importance of environmental issues to Toyota, the Environmental Report for this year and beyond will be compiled independently from the Sustainability Report, going back to the starting point when its first issue was published in 1998. The report so far has been published for experts who have particular interests or needs regarding Toyota's environmental activities but the target audience has now been expanded so that it can provide more readable, general-interest articles.

More specifically, the content is structured in two separate sections — for reading, and facts & figures — so that readers can first understand the outline by reading articles and then deepen their understanding by learning the circumstances, facts, figures and background information.

Incidentally, the "reading" section has been further divided into (1) Special Features, (2) Summary, (3) Topics and (4) Examples of Kaizen Initiatives in Japan and Overseas, the aims of which are summarized along with those of the Facts & Figures section in the table below.

Cover design features the year 2011 and the Prius  $\alpha$ .

The Great East Japan Earthquake occurred on March 11 amid the preparatory work for this report. The editor considered various proposals and finally decided to feature Toyota's environmental actions in facing the disaster taken from the standpoint of a corporate citizen that shares the same concerns and efforts as society. The report also focuses more on such approaches as eco-driving, energy saving and resource conservation in consideration of changes in societal interests since the disaster. Furthermore, based on the idea that it is necessary to strengthen the commitment to advancement because this is such a difficult time, more coverage is devoted to next-generation environmental vehicles and so on. We hope this report effectively conveys Toyota's commitment.

Finally, Toyota Motor Corporation reiterates its heartfelt sympathy for everyone who suffered the recent tragedy, wishes to express its heartfelt condolences to the victims and hopes for the earliest possible recovery of the disaster-stricken area. It is every Toyota employee's wish to be a small part of this effort.

### ["Reading" Section: Configuration and Objectives]

Category	Objective	Editorial Outline	Page
Special Feature	Presenting the corporate vision and direction of Toyota along with Top Message	<ul style="list-style-type: none"> <li>Developing the Prius <math>\alpha</math>: An eco-car gains meaning only with market penetration</li> <li>Strategies for next-generation eco cars</li> <li>Reducing the environmental impact by pursuit of efficiency (Central Motor Co., Ltd. Miyagi Plant)</li> </ul>	04~05 06~07 08~09
Summary	Reviewing Toyota's activities as well as progress in FY2010	<ul style="list-style-type: none"> <li>Summary of Toyota's initiatives on the environment</li> <li>FY2010 key environment data</li> </ul>	10~11 12~13
Topics	Covering social concerns about the Great East Japan Earthquake, eco-driving, Toyota's new models, the International Year of Forests and other topics from the period 2010-2011	<ul style="list-style-type: none"> <li>Disaster prevention and environmental measures related to earthquakes</li> <li>Eco-driving</li> <li>Thoughts on the environment from Chief Engineers of FY2011 new models (the Ractis, Vitz, FJ Cruiser and CT200h)</li> <li>Toyota's thoughts and initiatives on afforestation</li> </ul>	14~15 16~17 18~21 22~23
Examples of Kaizen Initiatives in Japan and Overseas	Providing examples of <i>kaizen</i> initiatives (in energy/global warming, recycling of resources, substances of concerns and atmospheric quality) to share knowledge with society and promote environmental initiatives	<ul style="list-style-type: none"> <li>Initiatives in CO<sub>2</sub> emission reduction in logistics (Japan)</li> <li>Eco-informational tour at dealer (Japan)</li> <li>Reducing CO<sub>2</sub> at plant (Thailand)</li> <li>Biodiversity education program in cooperation with NGO (France), and other initiatives</li> </ul>	24 27 29 31

### [Facts & Figures Section: Configurations and Objectives]

Objective	Editorial Outline	Page
<ul style="list-style-type: none"> <li>Organizing qualitative information such as quantitative data and progress reports to complement the "reading" section</li> <li>Including public scientific evidence and data on the cover page of each section to explain why this theme is important and relevant to issues such as energy and global warming</li> </ul>	•Energy/Global warming	32~35
	•Recycling of resources	36~39
	•Substances of concern	40
	•Atmospheric quality	41
	•Environmental management	42~47
	•Environmental philosophy and policies	48~55
	•Environmental data	56~59

**Period Covered** From April 2010 to March 2011.

For major ongoing initiatives, the most recent status update in 2011 has been included.

**Scope of Report** Toyota Motor Corporation's (TMC) own initiatives and those of its overseas consolidated subsidiaries, as well as the progress of consolidated environmental management in Japan and overseas.

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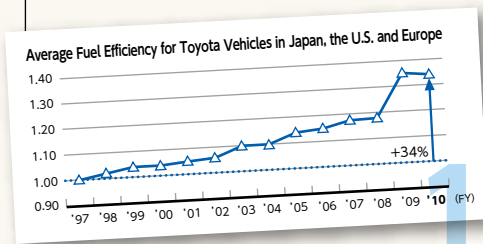


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# Rewarded with a Smile by Exceeding Your Expectations

I would like to begin by offering thanks for the continued support and understanding of all of our stakeholders. In addition, on behalf of everyone at Toyota I would like to express my wishes for the restful peace of all those we lost to the Great East Japan Earthquake, and to offer our sincerest sympathies to all who have suffered through this great tragedy.

When I reflect on the past year, I am touched by the support offered by so many of our customers and stakeholders as we dealt with the ongoing effects of the global financial crisis, as well as product quality and safety issues. I offer my sincerest gratitude.

Learning from these experiences, I continued to ask myself, “What kind of company do we want Toyota to be? What kind of company should Toyota be?” I realized that Toyota should strive to be a company that people choose, and that people are happy to have chosen. The Global Vision we announced in March is strongly imbued with these ideas. The Great East Japan Earthquake struck two days after we announced our Global Vision. Our employees entered the stricken areas in the immediate aftermath of the earthquake and began providing support, working together with local residents to reconstruct and restore communities. Upon viewing the situation after the disaster, our support teams assessed the situation, quickly worked out what was best for the communities and immediately set about their tasks accordingly. This represents the very spirit of Toyota’s “power of the workplace”— an asset built up

and handed down through 70 years of Toyota history. Priority was given to rescuing and preserving life, then to the restoration of the communities, with restarting production only considered after the situation stabilized.

The Toyota rescue teams made quick, difficult decisions on the spot. “Our biggest priority in rescue is saving human lives,” they said. “After that, we can see about recovery and getting manufacturing back on line.” These teams were able to make swift decisions and go into action immediately. This on-the-spot decision-making is typical of Toyota, and it is part of the storehouse of know-how and assets we have accrued over the 70 years of our existence. I was proud of these Toyota people.

This disaster also presented us with a chance to rethink the very concept of automobiles. Right after the quake, we heard from people in the area saying “Even though gasoline is in short supply, our Prius gives us the mobility we need,” and “While the electric power was out, we could charge our cell phones and watch TV for information without even turning the engine on,” and “The light from our cell phone is not very bright, but it was so comforting in the dark of the disaster area.” I recognized anew the importance of promoting and expanding our future development efforts.

Humankind faces urgent issues concerning both the global environment and energy. In short, if automobiles are to remain a vital mode of transportation for people and soci-

ety over the next century, developing the next generation of environmental vehicles is the most important thing we can do.

At Toyota, we will naturally hone our hybrid technologies, and in 2012, we will market plug-in hybrids that can be charged from household current and electric vehicles as well. In other words, we have programs that address the entire spectrum of automotive power.

We also announced a tie-up with Microsoft Corporation in April and one with Salesforce.com in May. At Toyota, we believe we can achieve a low-carbon, energy-efficient motorized society by fusing automotive, home and information technology. We're confident this will accelerate our transformation into the mobile society of the future.

We will keep striving to be a company that is rewarded with a smile by exceeding expectations of customers the world over. All our efforts focus on that goal, and we hope we can count on your continued support.



September 2011

President  
Toyota Motor Corporation

Chairman  
Toyota Environment Committee

## An Eco-car Gains Meaning only with Market Penetration Aiming for Greater Expansion in Use of Hybrid Cars by Matching a Variety of Lifestyles

The new Prius  $\alpha$  maintains vaunted Prius concern for the environment but adds extra space and greater ease of operation. With the introduction of Prius  $\alpha$ , hybrid vehicles gain additional flexibility and take us to the verge of an era in which hybrids are the normal choice in automobiles.



### To increase social acceptance of hybrid cars with Prius in the lead

The Prius is always at the forefront of Japanese hybrid vehicles, and plays a significant role in expanding the hybrid vehicle market. On the other hand, HV penetration has grown by market since the first-generation Prius was introduced and as consumers purchased HVs with new technologies. As the Prius went through its second and third generations, society became more aware of hybrid vehicles and gained considerable knowledge about them. This led to significant increases in HV sales. In fact, the Prius led new car sales in both 2009 and 2010. The cumulative number of Prius units sold exceeds 1 million in Japan and 3.1 million worldwide. In addition, including the Prius  $\alpha$ , there are now 16 hybrid vehicles models on the market. In other words, eco cars are becoming

mainstream vehicles.

Moving forward with the times, we developed the Prius  $\alpha$  to be a completely different vehicle from the original Prius. Our objective: a spacious and versatile hybrid car. That meant an affordable price, yet great fuel efficiency and comfortable space — all fused into a beautiful form. The Prius  $\alpha$  sets a new standard as an exclusive, spacious HV.

Toyota Development Center No.1 Chief Engineer Hiroshi Kayukawa, expressed his thoughts on the development policy of the Prius  $\alpha$ : “The car satisfies diversified user lifestyles while providing a comfortable, inviting space for families. They can view it as an expression of their own philosophy and basic values and feel good about their car-buying choice.”



**First-generation Prius (1997)**  
10-15 test drive mode  
**28.0km/L**



**Third-generation Prius (2009)**  
10-15 test drive mode  
**38.0km/L**

**Second-generation Prius (2003)**  
10-15 test drive mode  
**35.5km/L**

## Good environmental performance, plus more versatility

The Prius  $\alpha$  features the same 1.8L THSII HV system as other Prius models. But the battery for the 7-seat model was changed from nickel-metal hydride to the smaller, lighter lithium-ion type, which could then be placed beneath the center console to allow the addition of a third row of seats. Of course, just as with nickel-metal hydride batteries, lithium-ion batteries have to be recovered and recycled properly when their useful life is over. To accomplish that, we are building a lithium-ion battery recovery and recycling system, which is based on the current collection route and assumes the development of the appropriate technologies. In addition to steps taken with the HV system, environmental considerations include reducing vehicle weight in every way possible and minimizing aerodynamic drag, which reduces CO<sub>2</sub> emissions. We also use TSOP\*, a thermoplastic resin that is known for its superior recyclability, in bumpers, instrument panels and so on. And the air-conditioning registers are made of Bio-PET that uses plant-derived material. Therefore, while maintaining the high environmental performance of the Prius, we increased luggage room by 195L (from 5-seat models) or provide seating for seven. Because the Prius  $\alpha$  is more roomy than its predecessor, it can hold more luggage or carry more passengers, and thus appeal to a wider range of customers.

\* Toyota Super Olefin Polymer (TSOP)



Plastic panoramic roof



Lithium-ion batteries in the center console

## Enabling owners to choose Prius $\alpha$ without sacrificing anything was our challenge

Hiroshi Kayukawa, the man in charge of design and engineering, talked about some of the difficulties in the development process: "Our challenges included reducing weight everywhere possible and achieving both spaciousness and high fuel efficiency. We used a plastic panoramic roof and we worked extra hard to reduce the weight of every component, from frames to interior panels. We were also able to meet two opposing requirements — a wide, spacious cabin and excellent aerodynamics. The idea was that customers should be able to choose a hybrid, specifically the Prius  $\alpha$ , without having to sacrifice anything."

Although delayed by the Great East Japan Earthquake, the Prius  $\alpha$  was officially announced in May 2011.

When development was finished, Kayukawa said, "I feel we have perfected a hybrid vehicle that has plenty of space and is versatile, and is a fusion of fuel efficiency, space and styling at a very high level, and we achieved that level 14 years after the first-generation Prius was launched."

The hybrid market, which was pulled along by the Prius, will reach a new phase with the introduction of Prius  $\alpha$  models. The percentage of hybrids among all automobiles sold will rise, and hybrids will become the "common" cars of the not-too-distant future.



Prius  $\alpha$  Chief Engineer  
Toyota Development Center No.1  
**Hiroshi  
Kayukawa**

Column

### Hybrids Prove Their Value in Times of Disaster

On March 11, 2011, the Great East Japan Earthquake struck suddenly and viciously. But even in times of disaster such as this, Prius proves the value of its good fuel economy. We received this e-mail from a person in Kobe: "When the Great East Japan Earthquake hit, we could not get in touch with our parents there. If we went by air, we couldn't take supplies for the victims, so we rented a Prius and safely reached Kesennuma City. There was no fuel available in the stricken area, so we had to make the round trip from Niigata to Kesennuma without refueling. Without the Prius, it would have been impossible." At the disaster site, we heard someone say, "Our Estima HV had an electric appliance charging outlet, so we were able to recharge our cell phones, and we were even able to cook our emergency meals while the power was out."



Estima HV  
AC 100 volt  
1,500W  
accessory outlet

# Future Eco Cars, Hybrids and Technology to Link People, Cars and Homes with Smart Grids

At Toyota, we think that achieving market penetration of eco cars is the best thing we can do for the environment. Aiming at actualizing a low-carbon society, we will strive to make conventional engines more fuel efficient, use hybrid technology as a key technology in developing eco cars, improve performance, lower costs and broaden the lineup of eco cars available to the public. Further, we will work to incorporate smart grids into our people-car-home linkage.



## Promoting eco car development with hybrids as a core technology

On November 18, 2010, Toyota held a joint press conference on environmental technology at MEGA WEB to promote understanding of the various ideas and programs behind Toyota's next-generation eco-cars. The presentation, made by Executive Vice President Takeshi Uchiyamada, explained approaches to environmental technologies, including reducing consumption of fossil fuels by promoting the use of alternative energies such as electricity, eco car development plans aimed at CO2 reduction and progress in R&D on next-generation secondary batteries. Specifically:

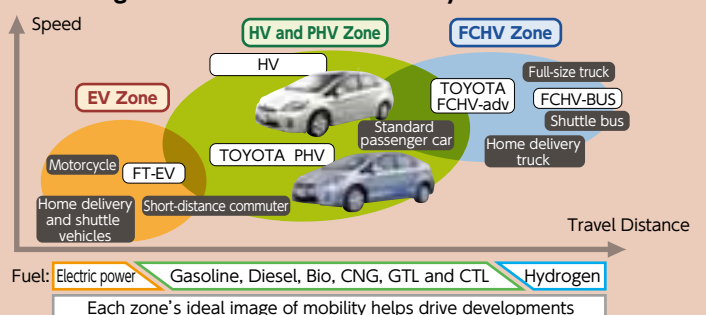
- (1) Toyota will have 11 HV eco car models on the market by the end of 2012, which will represent a significant lineup expansion.
- (2) Among the 11 HV models will be one subcompact with the aim of 40km/L fuel efficiency under the 10-15 mode.
- (3) Toyota will begin marketing a Plug-in HV (PHV) based on the Prius in early 2012. The sales target will be 50,000 units per year.
- (4) Toyota will introduce EVs based on the IQ model in Japan and Europe, in addition to the U.S., in 2012. The

aim is to sell several thousand per year.

- (5) Toyota is developing fuel cell HVs (FCHVs) and hopes to achieve a reasonable price around 2015, when we expect that the hydrogen supply infrastructure will be in place.

Development of solid-state and metal-air batteries to use as secondary batteries in eco cars that use electric propulsion will be further advanced and picking up speed.

### Zone Images of Next Generation Mobility





## Initiatives in the smart grid: linking people, cars and homes with ICT

Toyota sees cars, telecommunications and homes as part of its business scope and has ongoing projects in each sector. Now, so that the community can deal with the electrification of transportation via plug-in hybrids and electric vehicles, Toyota is using the know-how built up in its businesses to develop a smart grid that can “realize reductions in CO<sub>2</sub> emissions by optimizing the use of energy.”

As eco cars shift toward PHVs and EVs, it will be important to shift the timing of their recharges away from peak power consumption hours.

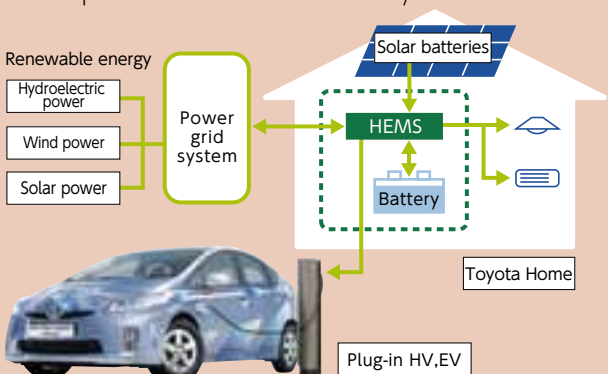
In addition to being modes of transportation, PHVs and EVs can also be considered energy storage devices, something we should not ignore.

This bares the possibility that, in the future, cars can link with homes to achieve the most efficient use of renewable energy, and this could well help to bring about CO<sub>2</sub> minimum communities that are in tune with renewable energy, which would contribute significantly toward a low-carbon society.

In October 2010, with this in mind, Toyota organized a demonstration project at Rokkasho-mura in Aomori Prefecture that seeks to supply electricity with zero in-and-out balance CO<sub>2</sub>. It aims at reducing energy consumption by making energy visible and creating a minimal amount of CO<sub>2</sub> in generating, consuming and self-supporting renewable energy as well as operating PHVs and managing their recharging, plus overall management of the electricity supply grid.

Other projects along this line are under way in Toyota City in Japan, Boulder Colorado, U.S.A, and Strasbourg, France, all aimed at finding ways to move toward a low-carbon society.

Toyota is also putting a good deal of effort into developing the Toyota Smart Center, an IT system we hope will help achieve a low-carbon society.



Developing HEMS with electricity storage capabilities, with solar power generation and vehicle charging included

## Toyota started out as a venture business and we're looking to revive that entrepreneurial spirit

If we are to move ahead with the development of eco cars and environmental awareness, we must think outside the conventional framework and we must link to a broad spectrum of our stakeholders. Toyota has tied up with the three venture-rooted businesses listed below. When Toyota first started manufacturing cars, we too were a venture business. And we feel that by tying up with these new businesses, we can revive the entrepreneurial spirit of our venture business days. We are looking forward to the results.



At the press conference to announce a business partnership with Tesla Motors, Inc. on May 21, 2010

### Major Tie-ups and Outlines of Their Businesses

Tie-up	Objectives and outlines of businesses
Tesla Motors, Inc.	Toyota partnered with Tesla with an eye on developing more electric vehicles. We developed a RAV4EV that utilizes the Tesla system. This EV will be marketed in the U.S. in 2012.
Microsoft Corporation	Toyota reached a basic agreement with Microsoft Corporation to build a global cloud platform for Toyota's next-generation telematics. Microsoft's Windows Azure TM will be used in the development of telematics services for the PHVs and EVs scheduled to be marketed in 2012.
Salesforce.com	We partnered with Salesforce.com to jointly develop a social network for automobiles called Toyota Friend. It will be part of the services offered with PHVs and EVs marketed in 2012.

Column

## Sales of 67 Smart Houses Started in June 2011 as Part of the Demonstration Project under Way in Toyota City

A smart house manages the linkage of household appliances, the family car and solar power generation capabilities to achieve more efficient use of household energy. Toyota Housing Corporation developed the smart houses to the concept of “Zero CO<sub>2</sub> Emissions from House and Car,” and their systems manage energy saving, energy generation and energy storage to achieve those goals.

At the Toyota City demonstration project, Toyota has enlisted the cooperation of various appliance manufacturers to develop the Home Energy Management System (HEMS), a system that controls all facilities and appliances in the house. It even has batteries to store electric power. In the Vehicle to Home (V to H) function, once the PHV has been charged, that power can also be used in the house.



Smart House demonstration project model home from Toyota Housing Corporation

## Built New High-efficiency Energy-conserving Plant with Compactness, Flexibility and Harmony

The Miyagi Plant of Central Motor Co., Ltd., was built under the concepts of compactness, flexibility and harmony, and represents a fusion of wisdom and revolutionary manufacturing technology. Efficiency and concern for the environment resulted in a reduction of 30% in energy use. Not satisfied at creating the most efficient, most flexible manufacturing systems in Japan, the plant employed new environmental technologies and took new systems to ever higher states of perfection so it can serve as the technology transfer point for emerging economies. The Miyagi Plant was damaged during the Great East Japan Earthquake, but is now back on line and leads the way in showing the world what Japanese *monozukuri* really means.



### First new domestic plant in 18 years seeks to redefine Japanese *monozukuri*

The grand opening of Central Motor's (wholly owned Toyota consolidated subsidiary) Miyagi Plant in Ohira Village, Miyagi Prefecture, was held on February 16, 2011. When Toyota closed its Kamata Plant in 1950, some of the employees got together to organize Central Motor, which sub-contracted production of Toyota vehicles, assembling them at Sagami-hara in Kanagawa Prefecture. The plant in Sagami-hara became outmoded, with aging equipment that needed to be replaced, so the company decided to build a new plant in Tohoku and moved its headquarters there as well. The Miyagi Plant is the first new Toyota Group plant in Japan in 18 years, and it has a production capacity of 120,000 units per year. It will produce compact cars such as the Yaris and Corolla, and it represents a fusion of new Toyota manufacturing technology and Central Motor

wisdom and know-how. The plant will be Toyota's model compact car production point for other Toyota operations worldwide. Toyota Chairman Fujio Cho, who attended the Grand Opening Ceremonies, said, "Our mission is to preserve Japanese *monozukuri*."



Grand Opening Ceremony

### A Compact, Flexible Plant that Achieves High Efficiency and helps Protect the Environment by Using 30% Less Energy

When designing and building the plant, the concept was to make the facilities as compact and efficient as possible while maintaining production flexibility. Efficiency and the environment, specifically energy use and CO<sub>2</sub> reduction went hand-in-hand with efficiency.

The body painting and assembly processes were rethought and redesigned to shorten the assem-

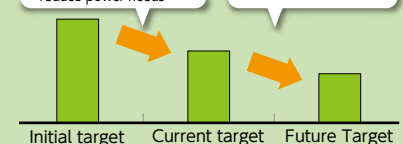
**New methods, compact processes and facilities throughout the plant reduce CO<sub>2</sub> emissions**

**-30%**

- Line size reduced with new paint process
- Plant building made more compact
- High-efficient equipment reduce power needs

**-30%**

- Green Electricity Activity
- Adoption of high-efficiency co-generation
- Plant trees, greenery to offset CO<sub>2</sub> emissions



bly lines and make the plant more compact. In the new assembly process, no vehicles are suspended from the ceiling by hangers, which reduced building and installation costs. At the same time, roof heights were changed from 7 to 6 meters, lower than normal, reducing plant and equipment costs. On the assembly line, certain components such as engines and chassis are installed from the side. Compared to conventional assembly lines, the distance between units was shortened, assembly of front and rear portions is done at the same time and the overall assembly line is 35% shorter. With these innovations, the floor area of the Miyagi Plant is 15% smaller than other plants with the same production capacity, and the interior volume of the plant is fully 30% less. As a result, it takes much less energy to air-condition the facilities. New paints that dry quicker enabled reduction of the painting booth and baking oven sizes so they use less energy, too. In fact, when all the energy-saving steps were calculated, the Miyagi Plant showed a 30% savings in energy compared to other plants of the same capacity.

These advances in manufacturing technology came as a result of fusing technology with wisdom and know-how, which is continued as the plant goes on line. Central Motor's employees have always worked at *kaizen* activities, improving equipment and procedures on a daily basis. After the Lehman Shock, when production dropped by some 30%, employees who were not busy applied themselves to developing even more *kaizen* steps. For example, they built an automatic guided trolley, which was purchased from an outside supplier before, and significantly improved it, cutting costs and improving efficiency.

This kind of initiative is spread across the organization at the new plant. One example of energy-saving activities, the people suggested "Zero energy use on off days," shutting all equipment and systems completely off. That meant turning off electricity, air pumps, cooling water — everything. And by taking the time to look over everything, component supply routes were shortened and straightened to the shortest distance between two points, and slanting floors inside the plant were used to achieve movement without application of power.

## With an emphasis on harmony, this plant blends into the community and is open to the community

One more part of the concept for its construction was harmony. That means a plant that blends into the community and is open to the community. Central Motor President Toru Kuzuhara said, "I started at the Toyota Motomachi Plant, and I have been a part of the building and opening of plants in Kyushu and in Guangzhou. At each place, one of the most important things on our agenda was to meld with the community and become symbiotic with it." Ohira Village is a very green town, so Central Motor created a walkway all around the plant, and opened it to the public. And along the pathway the company planted 27,000 Japanese red pine, Japanese black pine and sawtooth oak trees, all of which are native to the area. Inside the plant, pathways for visitors have been prepared and many elementary schools will organize tours for their students to see the plant and understand what it means to the community.



Planting trees

Column

## Disaster Strikes Only a Month after Production Began

When the Great East Japan Earthquake struck only a month after the Miyagi Plant went on line, tremors reaching 6 on the Richter Scale hit the plant. The particularly solid foundations allowed the plant to weather the quake with little or no damage to buildings, water treatment plants, oil tanks and the industrial waste management facility.

Some of the water mains were slightly damaged, but employees followed the emergency manuals to stop the leakage. And, because no hangers were used on the assembly lines, no vehicles crashed down on the line. The biggest problem that occurred when the earthquake struck was all cell phone usage cut off, and emergency communication was extremely difficult. Learning from that experience, we will use satellite phones. We will also set up emergency generating equipment and stock emergency foodstuffs.

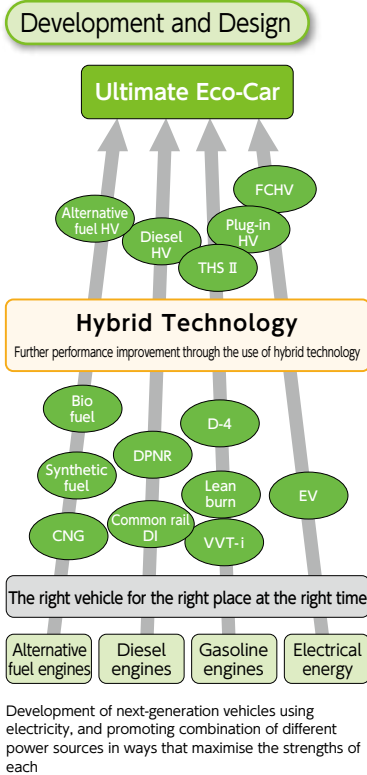


Leadership meeting at the emergency task force center

# Summary of Toyota's Initiatives on the Environment

Toyota aims at globally "establishing a low-carbon society," "establishing a recycling-based society," and "environmental protection and establishing a society in harmony with nature" to contribute to sustainable growth of society and the planet based on the Fifth Toyota Environmental Action Plan. To realize those aims, we reduce the environmental impact at all stages of vehicle life cycle from development and design, procurement, production and logistics, sales to waste and recycling, and promote environmental management.

## Establishing a low-carbon society Significantly reduce GHG emissions



### Production



Use of renewable energy considering the characteristics of each nation and region (photo: Tsutsumi Plant)

### Working together with Society



Promoting integrated actions on CO2 reduction (photo: Smart House collaboratively controls home electric appliances, cars and solar power to use home energy more effectively)



Eco-driving enlightenment activities (Photo: Monitor of ESPO installed in SAI and Prius α)

### Logistics



Activities to reduce CO2 by further improvement of transport efficiency (photo: Modal Shift)

## The Fifth Toyota Environ-

Environmental protection and estab-  
Receiving and continuing

Contributing to the establishment of  
by reducing the environmental impact

### Development and Design



Enhancing management of harmful chemical substances contained in products (Photo: REACH briefing session)

### Production



Expanding the use of waterborne paints worldwide



Toyota vehicles have been certified 50% lower than standard levels for 2005 or better.

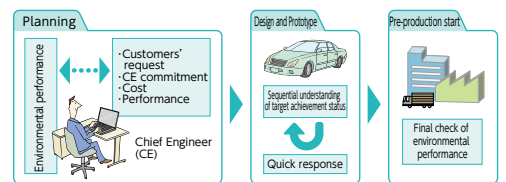
## Environmental



Enhancing and promoting consolidated environmental management

Toyota Green Purchasing Guidelines

Promoting environmental management to stakeholders such as



Promotion of environmental management ECO-VAS in product development

## Establishing a recycling-based society

Enhancing recycling of resources through 3R

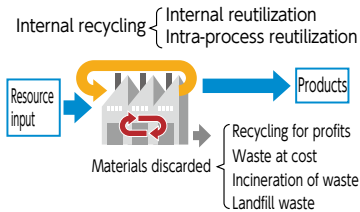
Promoting 3R (Reduce, Reuse, Recycle) and increase resource productivity on the assumption that various resources are limited

### Development and Design



Promoting use of Ecological Plastic for plastic parts  
(Photo: Parts of the SAI where Ecological plastic is used)

### Production



Enhancing development of recycling technology for effective reutilization of resources  
(Fig. Resource flow)

### Logistics



Continually reducing water use  
(Photo: Australian rain water project team)



Returnable containers

## Environmental Action Plan

Establishing a society in harmony with nature and the blessings of nature

Building a society in harmony with nature and taking into consideration biodiversity

### Working together with Society

### Recycling



Establishing technology aimed at recycling advancement  
(photo: Exterior view of a recycling plant)

### Working together with Society



Promoting biological and afforestation business  
(Photo: Example of roof greenery with maintenance-free TM9 Korai turf)



Promoting initiatives on biodiversity  
(Photo: Toyota's approach to biodiversity brochure)



Supporting activities in Japan and overseas through the Toyota Environmental Activities Grant Program



Enhancing environmental education at TOYOTA Shirakawa-Go Eco-Institute

## Management

consolidated subsidiaries, business partners and employees. This is the foundation of three aims to establish a sustainable society.



Promoting Sustainable Plant activities

Specialized Education	Name
Employee environmental awareness improvement education	Toyota Global Environment Month Events (every June)
	Toyota Eco Drive Month (every November)
Education by level	•Environment e-Learning •Environment Handbook
	New Employee Education
	Manager Education Executive Development Program
Specialized education	Environmental Protection Leader Education
	Internal Environmental Auditor Education
	Overseas Environmental Conservation Promoter Education
	Key Environmental Facility Worker Education

Environmental Education system



Environmental Report

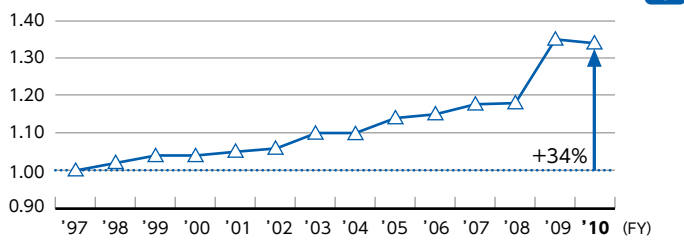
Toyota has promoted environmental management with four major themes: Energy/global warming, recycling of resources, substances of concern and atmospheric quality. Listed below are the main environmental data in Japan and overseas collected. Detailed information is reported starting on page 32.

## CO<sub>2</sub> Reduction

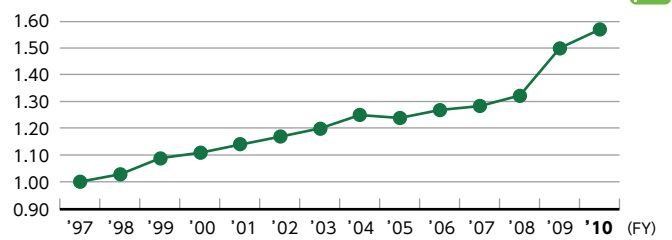
### Increase of Average Fuel Efficiency

Average fuel efficiency has improved due to expanding sales of hybrid vehicles (HVs), improvement of existing engines, adoption of high-efficiency transmissions and other measures. Meanwhile, global fuel efficiency for FY2010 was generally flat due to changes in model mix (decrease/increase in compact car models) resulting from the Lehman Shock.

Average Fuel Efficiency for Toyota Vehicles in Japan, the U.S. and Europe

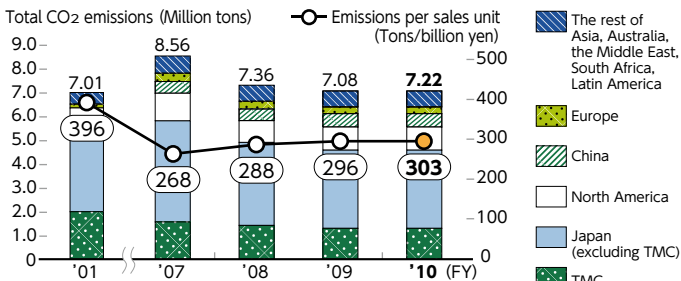


Average Fuel Efficiency for Toyota Vehicles in Japan



### CO<sub>2</sub> Emissions (from Energy Sources) and CO<sub>2</sub> Emissions per Sales Unit (Fixed Sources such as Plants and Offices) (Global)

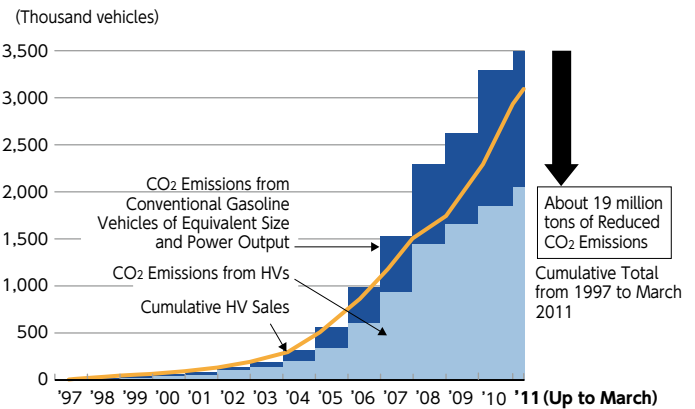
The FY2010 target per sales unit of the Fourth Toyota Environmental Action Plan was achieved due to enhanced productivity and steady daily improvement activities. However, the total volume increased from the previous year due to an increase in the number of units produced.



※113 companies (TMC, consolidated subsidiaries and other companies in Japan and overseas)  
 Japan: Companies subject to consolidated EMS (including sub-subsidiaries; excluding Toyota Tsusho) listed in Groups 1-5 on P.58  
 Overseas: Production companies and production/sales companies listed on P. 58 (excluding TMWR in Russia)  
 Note 1: In the case of companies for which FY2001 could not be determined, the oldest subsequent data is used  
 Note 2: Affiliates in China have been included since FY2005  
 Note 3: The CO<sub>2</sub> conversion coefficient has been calculated with reference to the GHG Protocol (see page 57)

### Cumulative CO<sub>2</sub> Reduction with 3.11 Million HVs (Toyota Estimate)

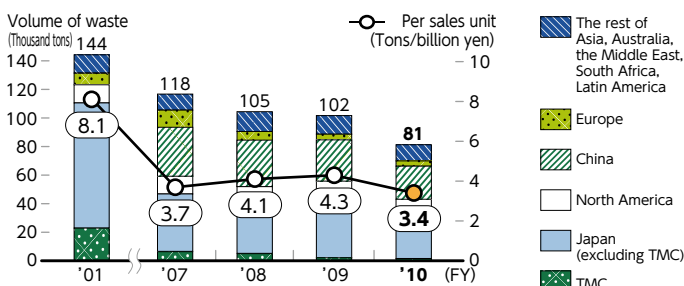
Global cumulative HV sales, mainly the Prius, exceeded 3 million units, and cumulative CO<sub>2</sub> reduction was 19 million tons.



## Reduction of Waste Volume

### Total Volume of Waste and Volume per Sales Unit (Global)

Both the total volume of waste and volume per sales unit declined due to promotion of waste reduction activities at affiliates in Japan and overseas

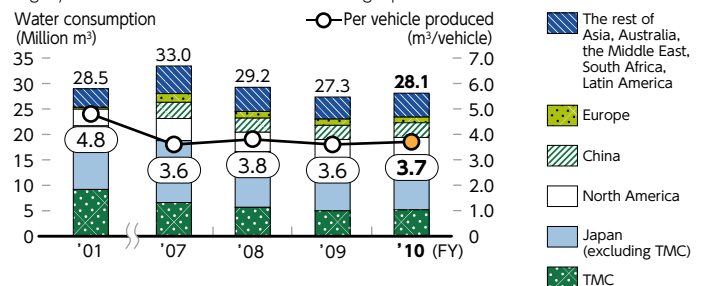


※Excludes recycling for a fee  
 ※113 companies (TMC, consolidated subsidiaries and other companies in Japan and overseas)  
 Japan: Companies subject to consolidated EMS (including sub-subsidiaries; excluding Toyota Tsusho) listed in Groups 1-5 on P.58  
 Overseas: Production companies and production/sales companies listed on P. 58 (excluding TMWR in Russia)  
 ※Regarding waste volume, Chinese affiliates have been included since FY2006

## Reduction of Water Consumption

### Water Consumption at Vehicle Assembly Plants and Consumption per Vehicle Produced (Global)

Water consumption per vehicle produced stabilized due to established steady conservation efforts at affiliates in Japan and overseas. However, in FY2010, the consumption rose slightly due to an increase in the number of target plants.



※33 companies (TMC, consolidated and other companies in Japan and overseas)  
 ※Regarding water consumption, Chinese affiliates have been included since FY2006

The icons categorize global and Japan data.  
Japan data includes TMC non-consolidated and consolidated data.

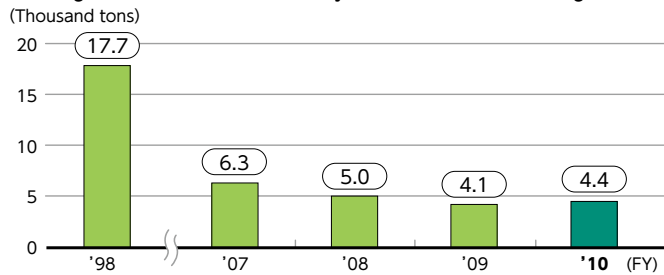


## Reducing Substances of Concern

### Discharge Volumes of Substances Subject to PRTR [Japan Production Environment Data]

The FY2010 target of the Fourth Toyota Environmental Action Plan was achieved due to the conversion to waterborne paint and an increase in the solvent collection ratio. However, the volume increased from the previous year due to an increase in targeted substances.

#### Discharge Volumes of Substances Subject to PRTR [Production/Logistics]

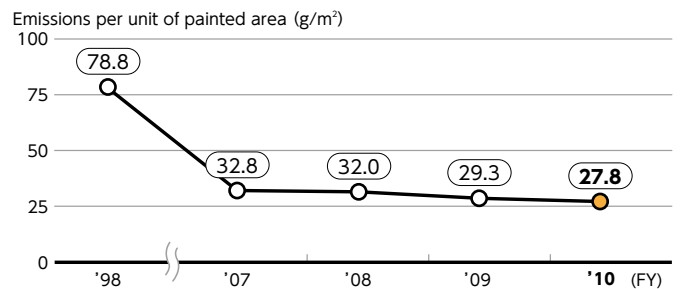


※ 34 companies (TMC, consolidated and other companies in Japan)

### VOC Emissions Volumes in Vehicle Body Painting Processes at Consolidated Companies in Japan

The result for FY2010 was 27.8g/m<sup>2</sup> compared to the target (FY2010: 35g/m<sup>2</sup> or less) in the Fourth Toyota Environmental Action Plan, due to conversion to waterborne paint and other factors.

#### VOC Emissions Volumes in Vehicle Body Painting Processes [Production/Logistics]



※ 8 companies (TMC, consolidated and other companies in Japan)

## Greenery of Emissions

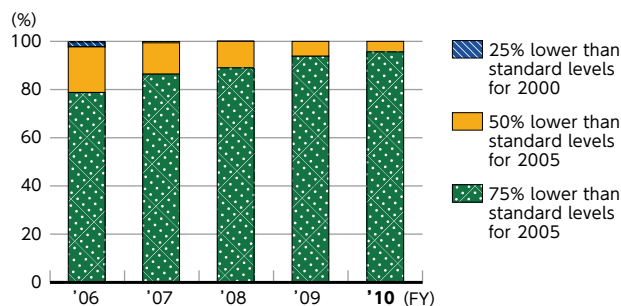
### Vehicles that Meet LEV Emissions Standards in Japan

In FY2010, almost 100% of Toyota vehicles produced were certified as meeting the Ultra-Low Emission Vehicle (U-LEV) or higher levels in Ministry of Land, Infrastructure, Transport and Tourism.

#### FY2010 Vehicles that Meet Japanese LEV Emissions Standards

Model	No. of Models (SU-LEV)	No. of Models (U-LEV)
Ractis	5	0
FJ Cruiser	0	1
Vitz	4	0
CT200h	1	0
Total	10	1

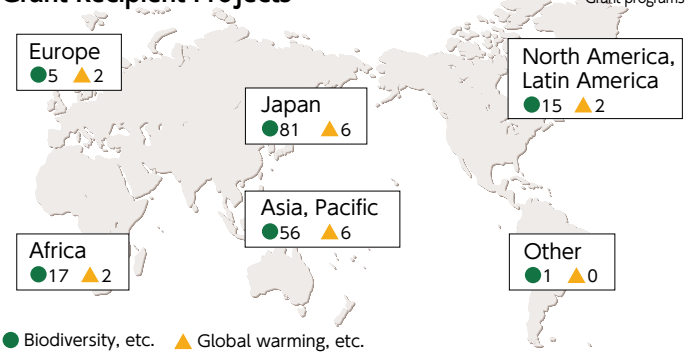
#### Low-Emission Vehicles as a Percentage of Total Production



## Promoting Consolidated Environmental Management

During FY2010, 18 grant recipient projects were selected based on themes targeting biodiversity and global warming. Cumulative grants for the past 11 years total 193 projects in 46 nations around the world.

### Toyota Environmental Activities Program Grant Recipient Projects



Activity Target Region	Asia, Pacific	North America, Latin America	Africa	Europe	Japan	Other	Total
FY2010	4	0	2	0	12	0	18
Totals	62	17	19	7	87	1	193

### Percentages by Companies Subject to Consolidated EMS Worldwide

Percentages of vehicles produced and sold by companies subject to the consolidated EMS worldwide was:

99% of vehicles produced and  
93% of vehicles sold.



# Topics

Toyota has responded to society's concerns across 2010-2011, such as earthquakes, eco driving, Toyota's new vehicle models and the International Year of Forests.

## Disaster Prevention and Environmental Measures Related to Earthquakes

Toyota has traditionally implemented risk management based on the expectation of Tokai-Tonankai earthquakes. From an environmental aspect, Toyota has carried out simulations on both the hard and soft aspects centered on environmentally important facilities in the fields of production and logistics. Now, in light of the Great East Japan Earthquake, Toyota is also preparing a system to recover and recycle vehicles damaged in the earthquake and tsunami, and will spare no effort in this initiative.



### Examples of Initiatives in the Production Field

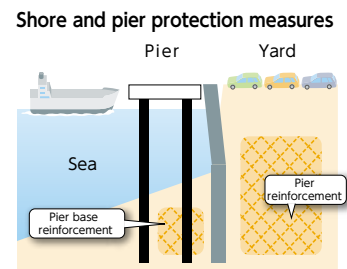
#### Measures against Earthquake for Environmentally Important Production Facilities

Toyota has already completed aseismic reinforcement work to prevent tipping, falling and slippage of tanks and water treatment facilities in production facilities, as preparation for the possible risks of Tokai-Tonankai earthquakes simulated by the Cabinet Office Central Disaster Prevention Council and other agencies. In light of anticipated revisions from the council, etc., Toyota will examine what steps to take going forward. And from a soft aspect, in addition to general emergency drills, Toyota is also carrying out emergency tabletop exercises based on scenarios such as oil leakage or other problems and plants.

### Examples of initiatives in the logistics field

#### Measures against Earthquake for Seafront Completed Vehicle Yards and Logistics Centers

Toyota's Meiko, Tokai and Tahara completed vehicle yards (ship loading sites), as well as the Tobishima Logistics Center (parts supply), are located on the seafront. The completed vehicle yards are vital logistics sites where annually about half of the domestically produced vehicles are loaded on ships. In light of the Hanshin Earthquake in Japan, and thereafter the projections for Tokai-Tonankai earthquakes, Toyota in 2006 began shore protection, pier quake-proofing, measures against liquefaction at each yard and measures against liquefaction at Tobishima. These were completed in 2008. And taking into account the experiences in the recent Great East Japan Earthquake, Toyota is reviewing the disaster recovery drills held each year, focusing on the reinforcement of the systems based more closely on reality.



### Examples of Initiatives in the Recycling Field (Regarding Earthquake Damaged Vehicles)

#### 1. Proper Handling of the Huge Number of Damaged Vehicles

It is difficult to properly handle all the vehicles damaged in the quake and tsunami, especially the airbags, so Toyota has joined with government and industry groups to build new channels for their safe, rapid recovery and proper handling.

Toyota is promoting the easing of airbag collection standards, based on the actual condition of the damaged vehicles.

#### 2. Proper Handling of Hybrid Vehicles

Toyota has long published a rescue manual to deal with accidents and disasters involving hybrid vehicles. In addition to providing a manual to scrap companies for removal of HV batteries from ELVs, Toyota has held its own detailed seminars. Toyota has worked anew to make these manuals that support proper handling of the vehicles widely available to local governments and scrap companies, while also dispatching a support team quickly to the area in response to local demands.



At a seminar with the police

Toyota is promoting the easing of airbag collection standards, based on the actual condition of the damaged vehicles.



## Energy (Electricity) Saving Initiatives

Toyota has traditionally promoted energy saving, from the viewpoint of reduced CO<sub>2</sub> and effective use of resources, in all areas of its business activities. Now, considering the Great East Japan Earthquake, energy saving activities centered on cutting electricity use are speeding up. Also, in order to balance out the demand on electricity, Japan Automobile Manufacturers Association, Inc. has decided that the industry as a whole move the weekend from Saturday and Sunday to Thursday and Friday during the summer season. Toyota is doing the same.

## Energy (Electricity) Saving Activities for the Office

### Accelerating Traditionally Through Energy Saving Activities

#### Energy (Electricity) Saving Activities at Tokyo Headquarters

Work at Tokyo headquarters is centered on the office. For energy, the air conditioning is supplied from district heat energy, and lighting, computers and peripherals are supplied by the power company.

Toyota has traditionally made efforts to save electricity, energy and cut CO<sub>2</sub>, but along with the 2007 Tokyo goal of a 25% reduction in greenhouse gas emissions and the 2008 revisions to the Tokyo Metropolitan Environmental Security Ordinance, activities were accelerated. The building was renovated in 2007, and from a hard aspect, upgrades to high-efficiency lighting equipment and sensors equipped lighting for rest rooms and stairwells were installed. From a soft aspect, as a result of shortening air-conditioning hours and having lights shut off during the lunch hour, for the building as a whole in FY2010 there was an approximately 27% cut in greenhouse gas emissions (2,270t) compared to FY2005 (3,117t).

With the Great East Japan Earthquake as the impetus, these efforts are being accelerated. Toyota is thinning light bulbs and expanding unlit areas in anticipation of the peak power cuts.

### Electricity Saving Measures from the Power Reduction Exploration Committee

#### Higashifuji Technical Center Energy (Electricity) Saving Activities

Higashifuji Technical Center is a research and development site with 4,200 engineers. By making energy consumption visible, the entire center has been saving energy (electricity) by such things as powering down during non-operation hours.

With the Great East Japan Earthquake as impetus, a "Power Reduction Exploration Committee" has been established as a response to this summer's power supply shortage. The committee promotes:

1. Office power reduction activities with office equipment and lighting, etc.
2. Promotion of power reduction activities for testing, which are the chief business of the center

Specifically, the center will reduce the number of testing equipment units used in combustion analysis of engine, reduce power consumption by revising preparation and testing methods in crash tests and level the power load through shifting work. Further energy savings will be pursued by making the effects visible and helping the improvements gained through these activities take hold.



Making power consumption visible

## Energy Use Reduction Activities on the Production Site

### Establishment of the BR Group to reduce fixed part of CO<sub>2</sub> Greater Energy Reduction Measures in Anticipation of Peak Power-cut Action Plan

The Business Reform (BR) Group was formulated in 2009 to clarify the optimum balance of power supply and demand at Toyota plants. The BR Group has expanded energy saving in the "shop axis activities," which laterally improve plants through every process, and the supply side and user side were united to promote energy optimization. In the paint process, the group adopted a minimum energy operation control system on the paint booth Air Handling Unit (AHU). In the unit process, some lines have been merged and discontinued, and steamless operation has been carried out, leading to a reduction 33,000 tons of CO<sub>2</sub> emissions (approximately 6.5 years of average home CO<sub>2</sub> emissions) and the accompanying energy costs. Drawing on its accumulated know-how, the group has supported the Tianjing plant in China, with excellent results. It has also achieved solid results in personnel training, with members who gained experience last year becoming leaders and promoting these activities. Toyota continually encourages the development of a structure where these improvements will not recede, but instead become firmly established. Further, the company will work toward even greater levels of energy reductions, in consideration of the recent power supply situation and in anticipation of peak-time power cuts.



Measuring the temperature of chilled water

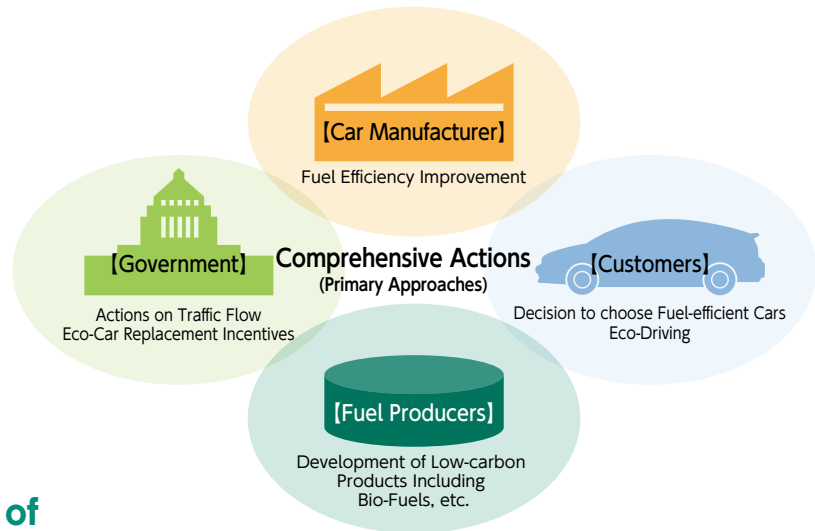


## To Encourage Eco-driving, Toyota Promotes Support Systems and Provides Informative Guidance



For the entire transportation sector to most efficiently reduce CO<sub>2</sub> emissions, it is vital for car manufacturers and all stakeholders to work together and drive forward countermeasures in a comprehensive manner. Such approaches are the most effective measure to generate effective results in both CO<sub>2</sub> reduction and cost performance.

It is also important that customers — those who actually drive the cars—also recognize their own role in the prevention of global warming. This is eco-driving. Concerns over eco-driving have been increasing gradually since the Great East Japan Earthquake. As a result, Toyota now promotes eco-driving support systems and provides informative guidance in a move to encourage eco-driving behavior.



### Development and Promotion of Eco-driving Support Systems

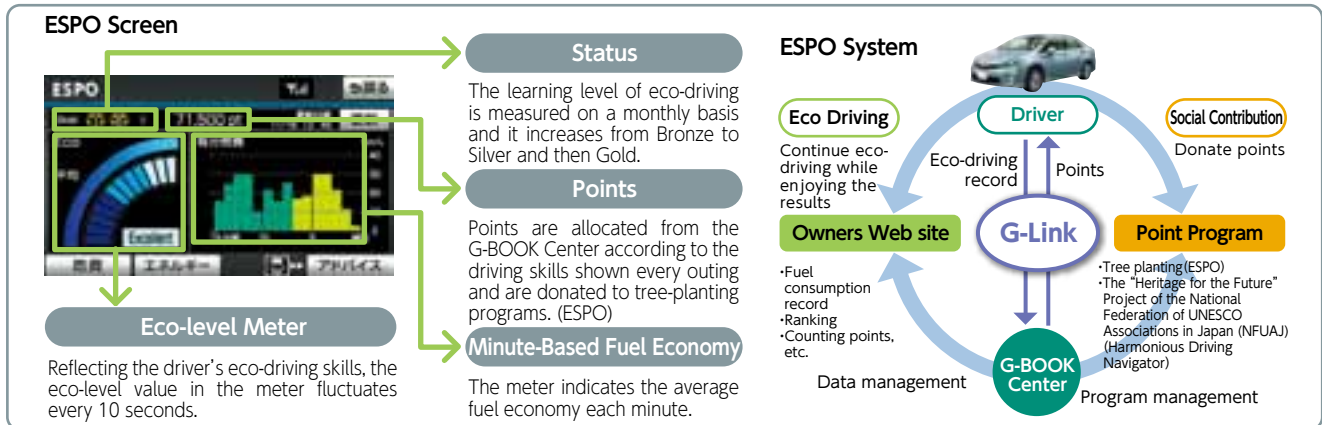
Driving is a significant factor when considering better on-road fuel-efficiency. For this reason, Toyota is working to develop and promote eco-driving support systems to help improve on-road efficiency in parallel with optimal efforts to maximize the fuel efficiency of the vehicles themselves.

Among such support systems, an increasing number of vehicles are equipped with Eco-Drive Indicator and fuel-economy meters. Furthermore, telematics service-based Eco Passport (ESPO) is now featured with the SAI, Prius and Prius α as has a similar system—Harmonious Driving Navigator—with the HS250h and CT200h.

### Major Eco-driving Support Systems

<b>Eco-Drive Indicator</b>	When the car is running in the eco-friendly mode, the eco-drive indicator lamp accordingly lights up to signal that status. In addition the zone display shows the current status of acceleration openness and eco-driving range.
<b>Fuel-economy Meter</b>	The meter indicates the average fuel economy over a given length of time, thus monitoring eco-driving performance. The ideal result is seen when used in combination with the Eco-Drive Indicator.
<b>ESPO (for Toyota models)</b>	The system monitors the eco-drive status on a real-time basis. Eco-drive data are transmitted to the G-Book Center through Toyota' Telematics Service G-Book for storage and can be accessed via personal computer or mobile phone. Eco points are earned depending on the reported data, and can be donated to tree-planting programs.
<b>Harmonious Driving Navigator (for Lexus models)</b>	The system offers the same functions as ESPO and eco points earned are used to support programs that support children under the "Heritage for the Future" Project of the National Federation of UNESCO Associations in Japan (NFUAJ).

## ESPO/Harmonious Driving Navigator System



## Informative Guidance on Eco-driving

To provide information on the further encouragement of eco-driving, Toyota is implementing Mobilitas\* Eco-Driving training sessions and other activities in the form of brochures and Web pages.

The Mobilitas Program provides participants with skills for efficient fuel consumption and safe driving through training in smooth throttle control and predictability-oriented efficient steering.

A brochure called 'Numerous benefits of Eco Driving,' a compact summary all about eco-driving, has been available since 2005.

An e-learning program called "Eco Driving Challenge!" explains the key throttle control technique on starting and things to keep in mind while driving. Movies make for easier understanding so that your eco-driving level is self-checked in a pleasant Q&A style.

\* Mobilitas: TOYOTA Safety Education Center at Fuji Speedway

Visit the Web site to learn about the "Eco Driving Challenge!"

[http://www.toyota-global.com/sustainability/environmental\\_responsibility/global\\_warming\\_prevention\\_initiatives/eco\\_driving/check\\_your\\_eco\\_driving\\_level.html](http://www.toyota-global.com/sustainability/environmental_responsibility/global_warming_prevention_initiatives/eco_driving/check_your_eco_driving_level.html)

### Column

#### Everyone Join the Eco-Drive Effort: Toyota Eco Drive for Japan

"If everyone has even a little awareness about eco-driving when they get behind the wheel, it will lead to a significant contribution to the environment." With such a message, Toyota's TV commercial "Eco Drive for Japan" has been aired since April 2011.



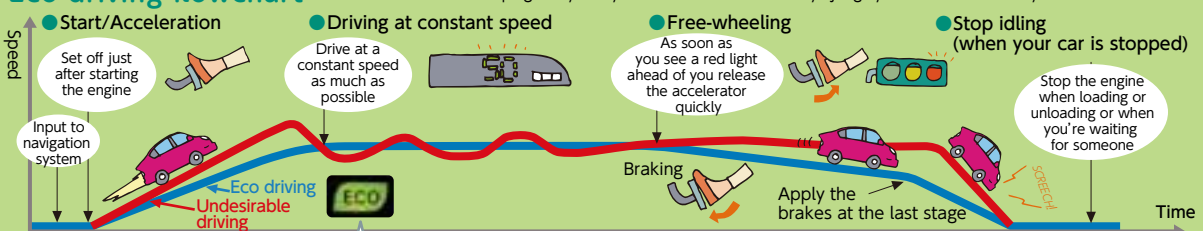
TV commercial "Eco Drive for Japan"

## 10 Tips on Eco Driving can make you an eco driver starting today

- Accelerate gently**
- Keep your speed constant (limit accelerate-decelerate cycles)**  
with ample interval from the car ahead
- Slow down using engine braking**  
Use engine braking to slow down
- Limit air conditioner use**  
Don't set air conditioner temps too low
- Don't idle your engine**  
Don't idle your engine unnecessarily
- Warm up your engine while you drive**  
Start out as soon as you start the engine
- Check and use traffic reports**  
Plan your drive, drive your plan
- Check your tire pressure regularly**  
Check your car daily and have it serviced regularly
- Don't carry unnecessary items (lighten your vehicle)**  
Don't carry things you don't need
- Be careful where you park**  
Don't park illegally, especially where it will cause congestion

Source: Japan Automobile Manufacturers Association, Inc.

### Eco driving flowchart



### Eco Drive Indicator

**ECO** It will light up when your driving is eco-friendly.



# Thoughts on the Environment from Chief Engineers

In the Toyota system of product development, the chief engineer bears a great deal of responsibility and has a lot of authority. As the development person in charge, it's his job to create a viable project team, set the development concepts and targets, decide on the performance criteria, the design and engineering, the price, the quality, the environmental goals, and the projected after-sales service. Every chief engineer carries on his development responsibilities carefully considering what the product can do for the environment, toward "building automobiles with superior environmental performance."

## 01.

### Ractis

Ractis CE

Toyota Development Center No.2

Kiyokatsu Miura



### Ractis Offers Fuel Economy (20km/L) and Concern for Resources



Everyone seeks mobility, and we feel that the role of an automobile is to provide that mobility in the safest, most comfortable manner while putting the least possible impact on the environment. So as an engineer, the sustainable initiative I had to undertake was to use the most advanced technology to create a car that would reduce the impact on the environment while offering measurable advantages to our customers.

With this new Ractis, fuel efficiency and use of resources were the most important points in our consideration for the environment, and these points were directly connected to owner benefits. The new model offers a lineup of 1.3-liter and 1.5-liter cars, each of which is 8-9% more fuel efficient than the original Ractis. And in the 1.5-liter 4WD version, coupling the engine with a CVT transmission resulted in some 24% improvement in fuel economy.

In addition to the greater efficiency of the engines, some 30kg reduction in vehicle weight also contributed to improved fuel economy. This new Ractis boasts a body that's 45% high-tensile steel, which takes advantage of Japan's superior steel technology and adds to the body strength as well. The deck board inside is of kenaf, a plant-derived material, and the wiring is aluminum, which is thinner than copper for the same capacity. In all, the steps we took to change materials resulted in a reduction in vehicle weight of about 30kg. Of course the lighter vehicle weight contributes to greater fuel economy, but it also means precious resources are conserved, vehicle performance is enhanced, and the car is also more comfortable.

Our programs considered resources in two ways. We did our best to reduce use of precious resources, and we used resources in the most effective ways possible.

Automobiles use a great deal of metal, and economic growth in emerging nations such as China and India has put

a great deal of pressure on supplies of copper, so in recent years, a lot of attentions is being paid to the issue of copper sustainability.

Copper is considered absolutely necessary for vehicle wiring. But in the new Ractis models, we were able to substitute aluminum, which is a plentiful resource. Aluminum is not as malleable as copper, and is more difficult to handle when very thin wires are twisted together. We were able to overcome that issue, which enabled us to substitute aluminum wiring for the copper we used before. This is an important step for Toyota.

As I said, the new Ractis has kenaf deck boards in the luggage compartment. Kenaf plants grow very quickly, and useful fibers can be extracted from them. The plants absorb CO<sub>2</sub>, and they are important from a sustainable resource point of view, but they also contribute to reduced vehicle weight (about 2kg less than conventional deck boards).



The deck board in the luggage is made of kenaf.

## 01. Ractis





# 02.

Vitz  
Vitz CE

Toyota Development Center No.2  
Hirofumi Yamamoto



## SMART STOP Turns off the Vitz Engine if It's Idling



The environment surrounding automobiles has changed significantly over the past few years. Economic malaise and global warming continue, gasoline prices rise, tax incentives on fuel efficient cars — these and other factors have led to automobile downsizing and spurred trends toward fuel-efficient cars and hybrids. In this environment, my conclusion is that Vitz, which is a core model among Toyota subcompacts, must continue to be easy to drive while maintaining its environment considerate characteristics. Our objective in development, of course, is to make Vitz a leader in fuel efficiency.

These days, fuel efficiency entails every aspect of a car's performance. The newest Vitz model not only includes Toyota SMART STOP, which turns off the engine if it's idling, but also more efficient engines and transmissions, greater use of high-tensile steel and other ways to reduce vehicular weight, an excellent aerodynamic coefficient of Cd 0.285, low-resistance tires, batteries that charge more quickly . . . in other words, we focused on every part of the performance package that would affect fuel efficiency, and everyone in every section of the entire task force aimed at achieving revolutionary low fuel consumption figures.

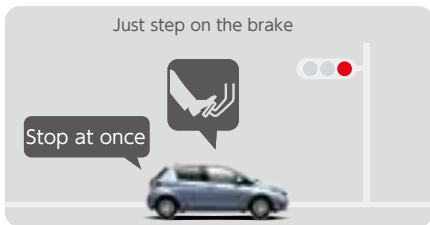
As a result, all the engines available for Vitz are significantly more fuel efficient than the ones we used before.

That said, among them, the 1.3-liter NR engine with CVT achieves 24.0 km/L, an improvement in fuel efficiency of

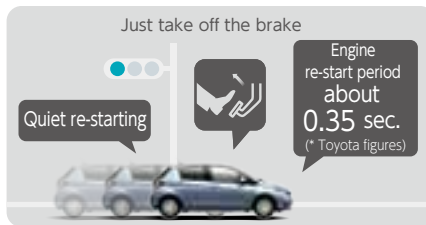
about 20%. Furthermore, if that unit is purchased with our newly developed SMART STOP, it will get 26.5 km/L, which is tops in the class.

Turning off the engine at traffic lights or when the car is stalled in heavy traffic is one of the most effective ways to improve fuel efficiency in cars used for urban driving. However, turning the engine off by hand when it's at idle could result in problems such as jerking when the car restarts, loud noises from the starter motor, big drops in air-conditioning efficiency and so on.

The newly developed SMART STOP system uses a one-way clutch and constantly engaged starter motor, which minimizes loss when stopping and restarting, reduces starter noise significantly and can be started at once even if the car has not come to a complete stop. At the same time, battery charging conditions, braking pressure conditions, and air-conditioning conditions are constantly monitored while the SMART STOP system is in operation. In other words, the driver needs pay no attention to the idling stop operation so there's nothing extra to worry about. At this point, SMART STOP is available only on F Grade Vitz models, but we plan to extend the system to other models within the lineup, as we would like as many customers as possible to take advantage of this new technology.



When the car comes to a stop, the engine is turned off



When the driver takes his foot off the brake, the engine restarts smoothly



Starts out smoothly, even on up or down grades

## 02. Vitz



Just flip the switch on the center console to cancel the SMART STOP system, then flip it back to re-engage. This is convenient when you know you'll be moving out again very quickly.



The multi-information display shows the time of the current idling stop and the total time spent in the idling stop mode.



# 03. FJ Cruiser

FJ Cruiser CE  
Toyota Development Center No.1  
Akio Nishimura



## FJ Cruiser – Its Basic Performance Takes the Environment into Account



The FJ Cruiser aims to make excitement a reality. To achieve that goal, our development process was totally thorough, both in persistence and in focus.

You might think, considering our goals, that we paid no attention to environmental concerns at all. But I assure you such was not the case. Our concern for the environment led to a basic position of “totally clean,” and our design process took the environment into account by using Eco-VAS\*1.

For instance, we reduced CO2 emissions with Dual VVT-i on the engine and a 5-speed automatic transmission, which resulted in amazing 8.4km/L (10-15 mode) fuel efficiency. In addition to the Dual VVT-i, exhaust emissions were further reduced with three-way catalytic converters and an air-fuel ratio compensator. In fact, the FJ Cruiser is certified as achieving exhaust levels of 50% less than 2005. To increase the recyclability of the FJ Cruiser, we used

TSOP\*2 resin for bumpers and in other places, and we used TPO\*3 for floor carpets and mudguards. TSOP, PP\*4, and other resins are used in matt black, which tends not to show the little scratches and dings that an offroad vehicle gets, so fewer of these items get changed, which also lowers the resultant amount of trash. Large components have a logo mark to make them easier to dismantle.

So you see that we kept the environment in mind not only with the vehicle’s performance numbers, but also with its total lifecycle, from production through disposal. As a result, the LCA, which measures environmental impact, showed the FJ Cruiser with lower emissions than other gasoline-powered vehicles in its class.

Offroad vehicles like the FJ Cruiser have an image of being vehicles with tremendous impact on the environment, but from the moment we started designing this vehicle, everything possible was done to improve its environmental performance. And, because we did that at the outset, we were able to develop a car that outdoor lovers can use to go offroad and have the time of their lives.



\*1. Eco-VAS: Eco-Vehicle Assessment System  
\*2. TSOP: Toyota Super Olefin Polymer  
\*3. TPO: Thermo Plastic Olefin  
\*4. PP: Polypropylene



1GR-FE V6 engine with Dual VVT-i

### 03. FJ Cruiser





# 04.

## CT200h

CT200h CE

Lexus Development Center

Osamu Sadakata



### Performance and Concern for the Environment in One Package



In developing the CT200h, which is only available as a hybrid, of course we had to create a car that offered “Agile Handling and Riding Comfort.” And we had to aim for the least possible environmental impact while achieving nimble performance. To help achieve that goal, we placed a Drive Mode Select Switch in the center instrument cluster.

The switch allows the driver to select from NORMAL, ECO, and SPORT driving modes. Depending on the mode selected, the instrument lighting also changes, which tends to change the attitude of the driver as well. In addition, to assist drivers into an eco mindset, we equipped the car with a Harmonious Driving Navigator, so the eco effect of driving conditions are shown on the navigation system’s screen. Accelerator work is monitored and its effect on eco-driving shown as Good, Excellent, etc., above the instruments. This information not only increases interest in driving for the greatest possible eco effect, but also helps drivers collect eco points, which result in donations to the “Heritage for the Future” Project of the National Federation of UNESCO Associations in Japan (NFUAJ).

We installed the Exhaust Heat Recirculation System as part of the technology that can help improve fuel efficiency. The system uses heat from exhaust gas to warm up cold engine coolant. In winter, this warming enables idling stop to operate sooner, which contributes to fuel efficiency.

The CT200h is the first Lexus to equip all grades with new humidity sensors. These sensors monitor interior

humidity, which is likely to cloud the windshield in colder seasons. They also control the air conditioning system’s air intake, allowing outside air in as needed and shutting it off when recirculation of warm inside air means greater comfort. The sensors and switches are very sensitive and operate continually as needed. This improves heater efficiency, which helps reduce fuel consumption.

With this system, a 1.8-liter Atkinson Cycle engine and hybrid system, and vehicle weight reduction achieved with the aluminum hood and greater use of high-tensile steel in the body, the CT200h achieves fuel consumption ratings of 34.0km/L, as a result of the synergistic effect with its best-in-class aerodynamics performance.

Other environmental performance-enhancing items include a new Ecological Plastic with bio-PET covering for the luggage area. Bio-PET is 70% by weight terephthalic acid, the raw material for polyethylene terephthalate (PET) plastic, and 30% monoethylene glycol, which is made from sugar cane. That reduces the amount of CO2 emitted in production, and contributes to conservation of fossil fuels.

Many small steps like this, combined with the environmental performance of the vehicle itself, make this model the most environment-considerate car we could possible produce.

### 04. CT200h



Drive Mode Select Switch

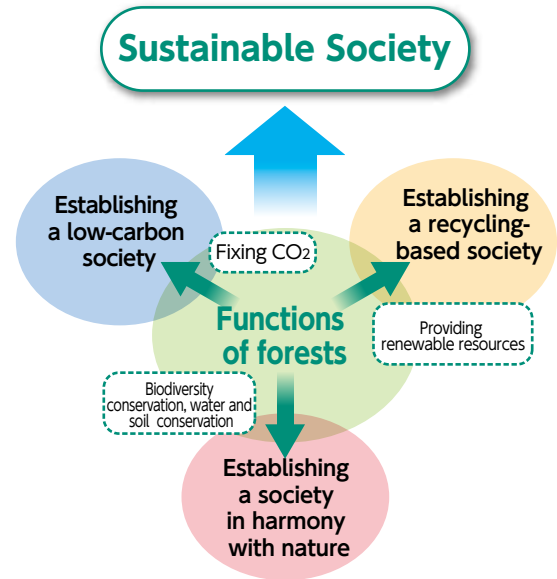
ECO MODE lamp at the bottom left is ON when ECO is selected, and the instrument lighting changes to blue. In SPORT mode, the instrument lighting is red.



# Toyota's Afforestation Activities Aim at Development of a Sustainable Society

Since its foundation, Toyota has conducted business with “contributing to the development of a prosperous society through the manufacture of automobiles” as a guiding principle. “Contributing to the development of a prosperous society” means “contributing to the sustainable development of the Earth.”

Forests serve to fix CO<sub>2</sub> and provide wood, which is a renewable resource, function as biodiversity conservation and soil and water conservation and contribute to all Toyota's three-pronged approach to environmental activities: “Establishing a low-carbon society,” “Establishing a recycling-based society” and “Establishing a society in harmony with nature.” We need not only plant trees, but also manage and use forests in an appropriate way to maximize their functions. However, devastation of forests becomes more serious as a result of various issues. Toyota has expanded tree-planting activities in Japan and overseas since 1992 when we established the “Forest of Toyota” plan concurrently with the United Nations Conference on Environment and Development (UNCED, Rio Earth Summit). Our aim is to address the challenges facing our forests today and promote a sustainable society through tree-planting efforts.

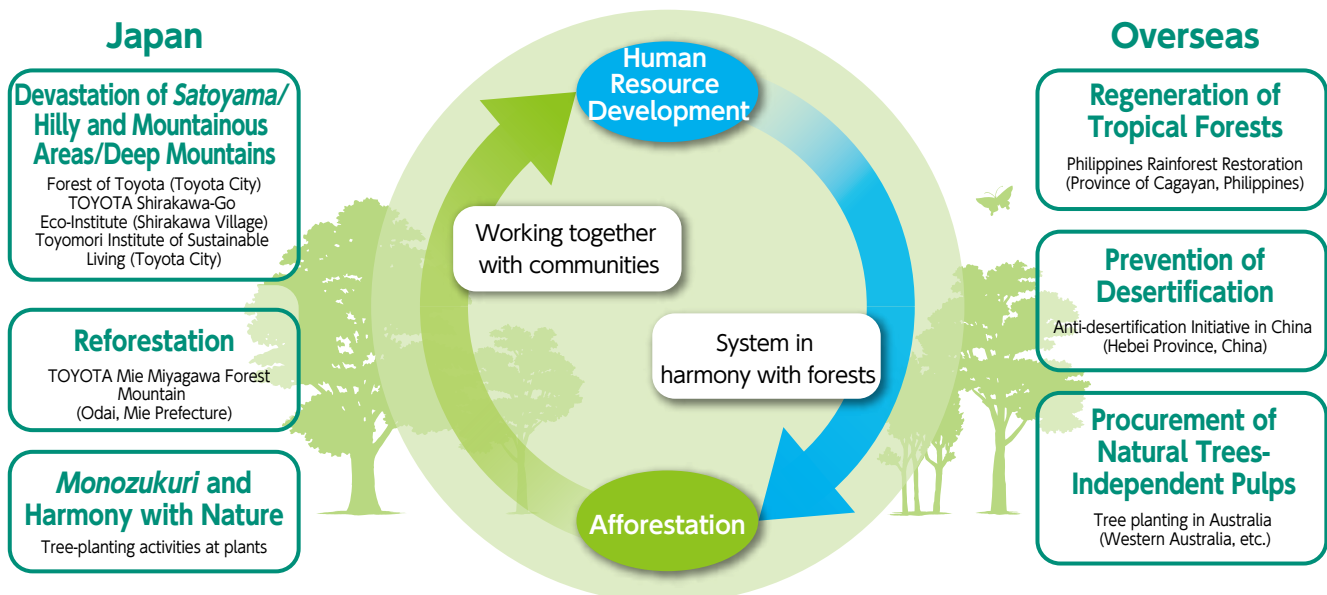


## Characteristics of Toyota's Sustainable Afforestation Activities

1. Toyota efforts focus on forest issues mainly in Japan and other Asian countries.
2. Toyota develops human resources and ties with local communities through initiatives to promote sustainable forestry activities and providing alternative livelihoods for citizens.

## Sustainable Afforestation Activities

Balance the needs of people and forests, continue afforestation independently, expand afforestation activities to other areas through human resource development and working together with communities





## Initiatives on Forest Issues, Examples of Projects

### Japan

#### Forest of Toyota Earns 'Superlative' Ranking from SEGES for Preservation of *Satoyama*

Toyota has engaged in the environmental preservation of forests (*satoyama* in Japanese) through restoration efforts at its owned forest (45 hectares) located on the outskirts of Toyota City. In March 2011, it received the highest-level certification from the Social and Environmental Green Evaluation System (SEGES). This is the first time a Superlative Stage certification has been issued since the system was launched in 2005.



SEGES certification

#### Expanding Programs at the TOYOTA Shirakawa Village Eco-Institute

The institute opened in 2005 with the goal of promoting widespread environmental education. It operates jointly with an NGO in Shirakawa Village. Valuing nature's wisdom, Toyota continues to improve and expand environmental programs rooted in the community. In 2011, the cumulative number of visitors surpassed the 100,000 mark.



Guided tour passes on day-to-day wisdom

#### Community Human Development Program for Forests, 'Toyomori' off to 2nd Phase

An advanced environmental education program called the Toyomori Institute of Sustainable Living was started in 2009 in cooperation with Toyota City and the Support Center for Sustainable Regional Design (NPO). Thirty applicants participated in its phase one course completed in 2010, and 26 were selected for phase two from 2011-2012. Once a month, the project provides instructions about food and agriculture, mainly through field work.



Participants experience rice planting

#### Continuing Program to Establish a Model Restored Forest in Japan

Toyota has developed the Toyota Mie Miyagawa Mountain Forest Project in a forest near Odai town, Mie Prefecture, since 2007. We have maintained and restored forests, and are engaged in technological development of forest restoration practices through industry-academy-government collaboration, mainly in Mie Prefecture.



Forest research

#### Continuing Sustainable Plant Activities in Pursuit of Harmonious Integration between *Monozukuri* and Nature

Toyota has been pursuing sustainable plant activities since 2007, with its Prius-producing Tsutsumi Plant as a model plant, to bring the concept of sustainability into *monozukuri*.

With the concept of "a plant that fully utilizes natural resources while operating in harmony with the natural environment," efforts are under way toward the following three points:

- (1) [Reducing energy consumption] Development and introduction of low CO<sub>2</sub>-emitting production technologies and daily *kaizen* activities
- (2) [Switching energy sources] Utilization of renewable energy (solar, etc.)
- (3) [Community involvement and ecological conservation] Tree-planting activities plants

As part of our the ecological conservation activities, Toyota held tree-planting programs involving employees and community residents. Employees experienced raising seedlings and making compost as well and were thereby encouraged to raise their ecological awareness. The tree-planting program was held at the Shimoyama Plant and the cumulative number of trees planted is about 240,000 (as of April 2011). Incidentally, in October 2010, the tree-planting project at Tsutsumi was named to the Urban Green Space Development Foundation of Japan's "100 Corporate Greenspaces Helping to Preserve Biodiversity\*" list.



Tree-planting activity held at Shimoyama Plant

\* 100 Corporate Greenspaces Helping to Preserve Biodiversity :

The Green Space Development Foundation of Japans elects 100 outstanding examples according to the following three criteria: 1) protection of habitats, 2) respect for local ecosystems and 3) utilization of Greenspaces

### Overseas

#### Localizing the Anti-desertification Initiative in China

In collaboration with the Hebei Province Forestry Department, since 2001 Toyota has been carrying out an initiative to stop desertification in Fengning Man Autonomous County, Hebei Province, where significant desertification has occurred. The third phase has ended in 2011, with trees planted on 3,000 hectares, the development of a system for sustainable local tree-planting activities and the transfer of the activities to local residents.



After trees planted

#### Philippines Rainforest Restoration Starts 2nd Phase

Since September 2007, Toyota has been jointly implementing a reforestation initiative with the environmental NGO Conservation International and other institutions in northern Luzon Island in the Philippines. The first phase tree-planting activity was conducted on 1,772 hectares (-July 2010), and the second phase was launched in August 2010. In the second phase, slated for completion in 2013, the focus will be on having local residents take over ongoing activities, such as establishment of a tree-planting fund with Mango after the project is over.



Growing nursing trees



# Examples of Kaizen Initiatives in Japan

By sharing some outstanding examples of initiatives with society at large, our aim is to broaden the loop of improvement activities.

## Example of Initiatives on Green Cars on the Increase

### Prius Goes beyond Corolla to Achieve Domestic Annual Sales Record

According to the statistics on annual new car sales for the year 2010 announced by the Japan Automobile Dealers Association, the Prius sold 315,669 units, surpassing the Corolla's annual model sales record of 300,008 accomplished in 1990. The Prius made the record high on top of Japanese automotive sales history.

In 1990, when Corolla's previous record was accomplished, Japan's total domestic new car sales volume was about 7.78 million vehicles, an unprecedented number for the country as well. Meanwhile, the domestic total for 2010 was less than 5 million. Though there are some driving

factors including the eco-car tax incentive, the fact is that the Prius broke the Corolla's record during a period of declining overall sales, thanks to growing acceptance of hybrid cars in a broad sector of society over three generations of this model. The cumulative total number of the Prius sold in Japan since 1997 has reached the 940,000 level.

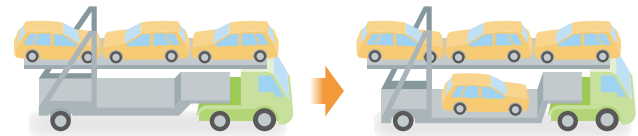
Total Sales Volume of Prius in Japan in FY2011:  
Cumulative Sales Volume worldwide (December 1997 through March 2011)

**315,669** vehicles  
**2,229,880** vehicles

## Examples of Initiatives on CO<sub>2</sub> Emission Reduction in Logistics

### Reduced CO<sub>2</sub> by 620 Tons/Year through Transporter Truck Modification

As an example of initiatives to reduce total transport distance, Toyota sought ways to increase the loading capacity of transporter trucks by modification of their deck design. During the round trip of 136 km between Hamura City, Tokyo and the Port of Yokohama, a double-deck transporter conventionally just carried three Land Cruiser Prado models on the upper deck. When a smaller model, Dyna, happened to be included in the freight list, it was loaded on the lower deck and therefore four — or 3.1 on average — vehicles were transported per service. That is because the lower deck width was slightly too narrow to load a Land Cruiser Prado. In an improvement action, the hollow square pipes for the lower-deck side frame member were replaced with band plates to gain space so that a truck could always carry four Prado models at a time, resulting in an average of 3.7 vehicles per trip.



#### Before Action

Loading Capacity	3.1 vehicles per trip
Number of Trips	37,000
Total Distance Transported	5.09 mil.km
CO <sub>2</sub> Emissions	3,826t/yr

#### After Action

Loading Capacity	3.7 vehicles per trip
Number of Trips	31,000
Total Distance Transported	4.27 mil.km
CO <sub>2</sub> Emissions	3,206t/yr

### Reduced CO<sub>2</sub> by 440 Tons/Year in Modal Shift with Redesigned Automated Car Warehouse

Vehicles bound for dealers in the Tokyo area are usually stored in an automated car warehouse at the Port of Yokohama after marine transportation. The Noah and Voxy minivans, because of their high-roof designs, could not be housed there and so were shipped over land to Higashi Fuji in transit to Yokohama. In a recent modification, some of the two-story passenger car racks in the warehouse were rebuilt into single-story spaces for RV models such as the Noah and Voxy meaning they can now be shipped directly to Yokohama by sea.

#### Before Action

Land Transport Distance	323km
Marine Transport Distance	0km
CO <sub>2</sub> Emissions	1,484t/yr

#### After Action

Land Transport Distance	16km
Marine Transport Distance	380km
CO <sub>2</sub> Emissions	1,047t/yr

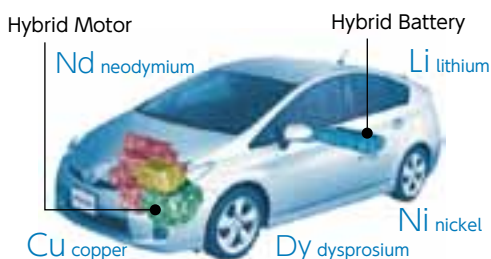
## Example of Initiatives on Recycling of Resources

### Recycling of Resources as Countermeasure to Resources Risks

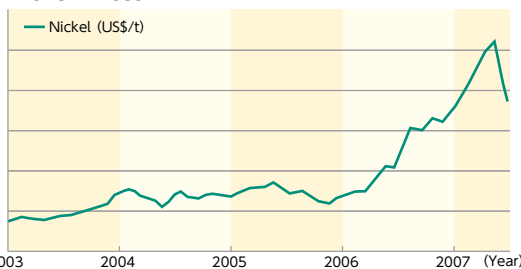
In recent years, as advanced technologies are increasingly incorporated into automobiles, car manufacturers are using more of such parts as motors and electronic circuit boards. Particularly when it comes to hybrid vehicles, there has been an increase in the use of components that have not been employed in conventional engine-driven vehicles, such as batteries and motors containing "rare earths" or "rare metals."

Some of these resources bring concerns about future depletion because of a low reserve-production ratio or sourcing risks from the overconcentration of producing countries. Consequently their procurement is vulnerable to economic and political trends and prices are inherently volatile. These factors may affect future automotive production and sales.

To ensure that customers will have a steady supply of good cars, Toyota is addressing the issue of using finite metal resources that may be in short supply due to depletion and uneven distribution of resources by seeking stable procurement through development of new sourcing channels. At the same time, Toyota is stepping up efforts in recovery and recycling of resources from end-of-life vehicles (so-called "urban minerals").



Nickel Prices



Source: Japan Oil, Gas and Metals National Corporation Report

### Rare Metals/Rare Earths Car-to-car Recycling

#### [Recycling of Resources as a Countermeasure to Sourcing Risks]

Toyota, jointly with Toyota Chemical Engineering Co., Ltd., Sumitomo Metal Mining Co., Ltd. and Primearth EV Energy Co., Ltd., has launched the world's first "battery-to-battery" business to recycle nickel in used hybrid-vehicle nickel-metal-hydride batteries for use in new batteries.

Previously, nickel-metal-hydride batteries recovered by car dealers and vehicle dismantlers were subjected to reduction treatment, and scrap containing nickel was recycled as a raw material for stainless-steel manufacturing. Now, with the development of high-precision nickel sorting and extraction technology, high-grade nickel materials can successfully be separated.

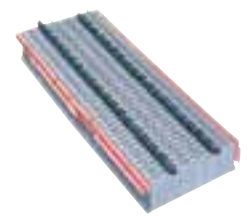
Currently, nearly 50% of the nickel materials included in the batteries is recycled as material for new batteries.

One-hundred percent recycling of the remaining 50% of nickel, cobalt and rare earth has reached the final validation phase, moving toward real "battery-to-battery" recycling initiatives.

In addition, Toyota established an exclusive network to collect used batteries through the Toyota HV Call Center, accepting batteries 24 hours a day from all over Japan. (FY2010 result: over 90% of used batteries were collected.)

The used batteries are transported via trucks on return trips from parts deliveries, offsetting their environmental impact, including CO<sub>2</sub> emissions during transport.

Toyota's future plans include further improving recycling capacity and establishing the system in North America and Europe.



Nickel-metal-hydride battery

#### Battery Material Recycling Business Structure





## Examples of Initiatives on Recycling of Resources

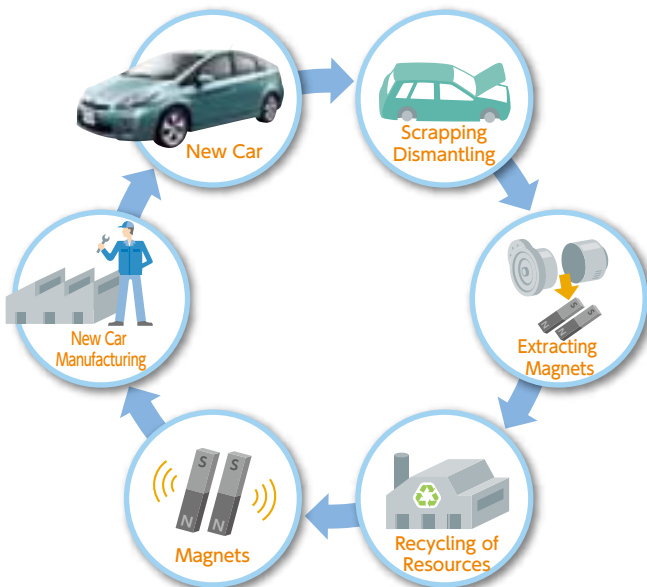
### [Initiatives on Other Rare Metals/Rare Earths]

#### Recovering Neodymium and Dysprosium from Motors

Neodymium and dysprosium are indispensable substances for the magnets used in hybrid car motors. To further the sustainable production of motors, Toyota is working to develop a motor that minimizes the use of rare earth, while working in parallel to develop car-to-car recycling.

At present, we have completed technological development to extract magnets from motors, and are working jointly with affiliates on technology to extract rare earths from used motors.

#### Toyota's Goal of Magnets Car-to-Car Recycling



### [Recovering Copper Resources from Wire Harnesses etc.]

Copper is used in electric cables for motors and battery cables in addition to wire harnesses (electric cables, etc.) in HVs and EVs. Copper is not considered a rare metal, but it is a limited critical resource.

Toyota has conducted research and development in areas including sorting technology, and other various types of development such as parts evaluation tests and processes to recover wire harnesses from used vehicles to recycle for new parts.

#### Years of Reserves for World's Main Metal Resources (as of 2005)

	Copper	Aluminum	Iron	Nickel
Years of Reserves	32 years	152 years	105 years	42 years

Source: U.S. Department of the Interior, U.S. Geological Survey  
 Mineral Commodity Summaries 1996, 2006

### World's First Use of Bio PET (Polyethylene Terephthalate) Adoption of Ecological Plastic in Car Interiors

Toyota has been applying Ecological Plastics to automobiles since 2000. In January 2011, the world's first product using bio PET was launched. Bio PET is a plastic material formulated from a sugarcane-derived bio-substance, replacing conventional PET's mono-ethylene glycol (constituting 30% in weight), which was jointly developed with Toyota Tsusho Corporation. Starting with the luggage-compartment liner in the Lexus CT200h, Toyota plans to increase both the number of vehicle models featuring the new material as well as the amount of vehicle-interior area covered by it, and intends to introduce a vehicle model within 2011 in which Ecological Plastic will cover 80% of the vehicle interior surface.



Sugarcane



New Bio PET plastic in the CT200h

#### Key Features of Bio PET

1. Drastically improved performance (heat-resistance, durability performance, shrink resistance) compared to conventional bio plastics and performance parity with petroleum-based PET
2. The potential to approach the cost-per-part performance of petroleum-based plastics through Bio PET volume production
3. Usability in seats, carpeting and other interior components that require a high level of performance

Further, Toyota set the specific action and goal of "Establish a technology that enables 20% usage of ecological plastics and recycled plastic materials in resin parts by 2015" in the Fifth Toyota Environmental Action Plan, and is pursuing various efforts. Toyota has set goals and action plans for every part, aiming to increase the adoption of recycled plastic materials from used bumpers, and is carefully tracking its progress. At the same time, Toyota is conducting new research and development to eliminate paint film fragments by lowering impact-resistance.



Removing used bumper

## Examples of Initiatives on Environmental Management

### Kinuura Plant Biotope Provides Community's Children with Hands-on Experiences and Opportunities for Observing and Learning about Nature

The biotope park was constructed in the winter of 2006 as part of a commemorative program for the 30th anniversary of the Toyota Kinuura Plant. It made use of treated sewage from the plant as the water source. Under the concept of "school-ground biotope," it provides environmental education to the community's children through various opportunities to observe and learn about nature. Some 700 to 800 second-grade students visit the park from local elementary schools in June of every year to observe the biological environment, which was artificially created yet is still full of life. Through the hands-on experience such as observing aquatic creatures and plants obtained here which encourages interest in and concern for nature, the children are inspired to learn more about

wildlife and the ecosystem.

From spring to summer, numerous flowers and plants are seen growing around the water, and visitors can see killifish in the pond. Dragonflies and butterflies disappear in autumn and leaves turn red. Such changing scenes of the seasons are compiled into the *Biotope News* and distributed via email during the flourishing period every year.



Second-grade elementary school students observing aquatic creatures and plants

### Environmentally Considerate New Head Office Hosts Eco-informational Tour

#### Toyota Corolla Shin-Osaka Co., Ltd.

Toyota Corolla Shin-Osaka Co., Ltd. (President: Yukio Kubo) is a Toyota dealer that has 41 distribution bases in the northern part of Osaka Prefecture. It embraces the following management principles:

- 1) Engaged in building a wealthy society and developing automobile-related business operations jointly with Toyota.
- 2) Will be a company supported and chosen by customers with personally customized services and social contributions.
- 3) Will put the "Environmental Declaration" into practice.

The company is carrying out business operations based on these principles.

And, its head office building was completed in September 2009 under the concept of "Coexistence with Nature," considering harmony between automobiles and humanity.

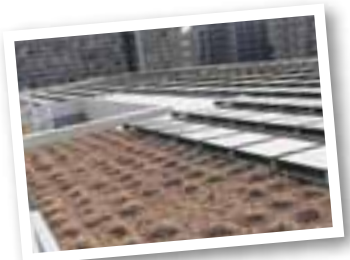
Also, as part of its social contribution efforts, one of the principles for operation, Toyota Corolla Shin-Osaka invited its customers and their children to an informational tour at the new head office building on January 29 and 30, 2011, to introduce facilities related to the company's environmental activities and unveil an environment-themed mural on the wall of the mezzanine. The tour program has been repeated on the last weekend of every month since then.

Heard among participants were such comments as "Pictures on the stairway looked pretty and I want to join this company when I grow up (a child)," and "I was able to see a part of what was going on in the back office and was amazed to know how many people were involved in delivering our cars (an adult)."

#### Main Environmental-considerate Initiatives

- (1) Louver boards, made of cedar thinnings from Hyogo Prefecture are effectively placed on the upper part of the soaring showroom, contributing to *satoyama* (mountain forest) restoration.
- (2) The louvers used for walls on the floor of the parking area are made of recycled wood processed in a blend with wood chips of waste plastic products including PET bottles.
- (3) The rooftop is partly covered by a 130m<sup>2</sup> green area planted primarily with sedum, a dryness-resistant succulent plant of the *crassulaceae* family, to help prevent the heat-island effect. It is also equipped with 50 kW solar panels to power all the air-conditioning and lighting apparatus on the seventh floor. The solar panel system, operating since February 2010, generates enough power to supply more than 10-12 standard households.

Rooftop sedum garden



#### Overview of Informational Tour

- (1) A total of 55 people participated (from January to March).
- (2) A hands-on experience course in "aroma candle making from cooking oil" was held.
- (3) A stamp rally to recycle louvers, green rooftop, solar panels etc. was carried out.
- (4) Aroma candles and tour certificates were presented to participants.



Children receive certificates



# Examples of Overseas Initiatives

Toyota and Toyota affiliates worldwide join hands in planning and carrying out programs that deal with four main themes: Energy and global warming, recycling of resources, substances of concern and atmospheric quality.

[Energy/Global Warming]

## Prius PHV Demonstration Program including Cold Resistance in Canada

### North America: Toyota Canada Inc. (TCI)

Toyota has conducted the Prius Plug-in Hybrid Vehicle (PHV) demonstration program in Japan, Strasbourg, France, and Tianjing, China, aiming for an early 2012 launch date. In December 2009, Toyota Motor Sales U.S.A. Inc. (TMS) launched the 2010 program. Here in North America, more than 150 PHVs are placed in regional clusters with select partners for market/consumer analysis and technical



People concerned Prius PHV

demonstrations. In March 2010, Toyota Canada Inc. (TCI) began the first phase of a national Prius PHV demonstration program in Canada.

Under this demonstration program, TCI is initially partnering with 16 organizations including academic institutions, provincial government departments, municipalities and provincial power authorities. It lent vehicles to its partners in four provinces—British Columbia, Manitoba, Ontario, and Quebec—to assess the Prius PHV's performance under a range of driving and climatic conditions. Near the end of 2010, TCI and its partners assembled in Ottawa for a round-table meeting to share initial results and discuss feedback from the Canadian demonstration program. Data from this demonstration program will be analyzed by Toyota in conjunction with the results of programs in the U.S.

Toyota believes these demonstration programs are a necessary step in preparing society for PHVs. "Real-world testing is essential to successfully introducing plug-in vehicles. Like any revolutionary technology, the benefits of the Prius plug-in hybrid will be realized only if people adopt it," said Yoichi Tomihara, President & Chief Executive Officer Toyota Canada Inc. This technology will reduce the amount of petroleum needed to power vehicles and potentially reduce both mobile source greenhouse gas emissions and criteria pollutants.

[Energy/Global Warming]

## Toyota Surpasses Voluntary Commitment Target on CO<sub>2</sub> Reductions in EU

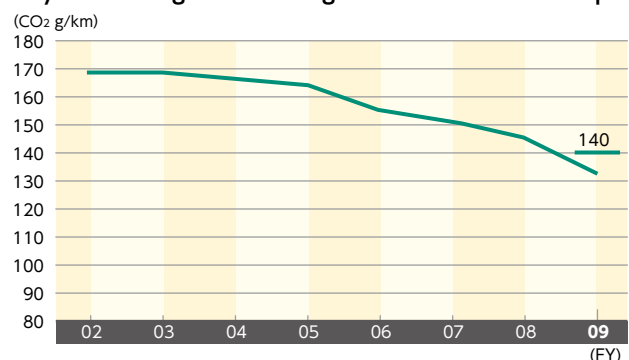
### Europe: Toyota Motor Europe NV/SA (TME)

The European Commission expressed concern about global warming early on, and along with the Association of European Automobile Manufacturers' Association (ACEA) announced a voluntary commitment in 1998 to reduce CO<sub>2</sub> emissions by passenger cars sold in the Europe to 140g/km by 2008. Later, the Japan Automobile Manufacturers Association (JAMA) and the Korean Automobile Manufacturers Association (KAMA) made the same voluntary commitment, to be achieved by 2009.

In the Fourth Toyota Environmental Action Plan (FY2006-2009), Toyota included a specific action and goal: Realize the JAMA commitment to reduce CO<sub>2</sub> emissions to 140g/km by 2009." The action included use of advanced technology such as Dual-VVTi, Valvematic and D-4S dual injection for gasoline engines, common-rail systems for diesel engines, and hybrid systems, as well as taking a proactive stance to introduce lightweight subcompact models and making significant progress in reducing CO<sub>2</sub> emissions.

As a result, according to the data reported by automotive market researcher JATO, Toyota achieved a 132g/km average for its passenger cars in Europe during 2009, less than the voluntary commitment target of 140g/km.

### Toyota Passenger Car Average CO<sub>2</sub> Emissions in Europe



[Energy/Global Warming]

**Reducing CO<sub>2</sub> by Using Exhaust Heat at TMT's Ban Pho Plant**

**Thailand: Toyota Motor Thailand Co., Ltd. (TMT)**

The paint shop at TMT's Ban Pho Plant developed an innovative method to reduce carbon dioxide emissions in the production process.

Recovered waste heat, in the form of hot water, is turned into energy to produce chilled water using an absorption chiller. The conventional method required heating water in a natural gas-fired steam boiler. Since FY2010, the waste heat exhausted from the regenerative thermal oxidizer (RTO) of the paint shop, which operates at 220°C, is captured by a heat exchanger that produces 90°C hot water, fed into an absorption chiller as energy for preparing chilled water, and then transferred to the painting line. In addition, intelligent software is installed in the absorption chiller to turn the machine on and off and adjust the temperature to the correct range for actual usage. This software helps the machine maximize energy savings.

This method reduces the consumption of natural gas used for vapor generation by approximately 4 GJ/h, which is equal to 3.5 MMBTU/h of natural gas. Moreover, CO<sub>2</sub> emissions were reduced by 840 tons and costs were reduced by about 7.2 million baht (US\$236,300\*) for FY2010.

As burning natural gas at the Ban Pho Plant produces a large amount of heat, TMT decided to use heat pump technology to preheat water before feeding it into the boiler and produce chilled water for the paint shop. This was completed in December 2010 and reduced CO<sub>2</sub> emissions by 376 tons per year for FY2010.

\* As of June 2011



Using exhaust heat

[Recycling/Resources]

**Employees Get Involved in Initiatives to Reduce Water Use**

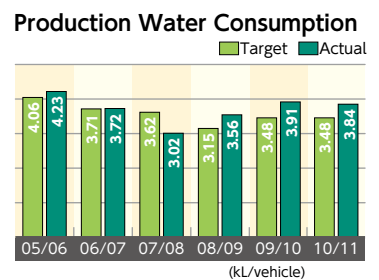
**Australia: Toyota Motor Corporation Australia Limited (TMCA)**

Rainfall is unpredictable in Australia and the country has focused on nation-wide efforts to save water. The TMCA plant in Altona, Victoria, and the corporate headquarters in Port Melbourne are designated as significant water users under the Victorian Government's "Our Water Our Future Program". This requires annual reviews to ensure efficient on-site water use.

At Port Melbourne, the company has a 350-kilolitre rainwater tank and reticulation system. The TMCA plant in Altona uses 405,829 kiloliters (kL) annually, a 13% decrease from last year's consumption (463,893 kL). Water use per vehicle produced was higher in 2009-10 compared to 2008-09 due to a decrease in production volume, but came close to meeting the target set for the year. The decrease was due to initiatives including: improving cooling tower efficiency by improving water recirculation rates, resulting in annual water

savings of 11,000 kL; reducing the use of water at the Paint Shop Trade Waste Treatment Plant and in the Paint Shop Sludge Pool process by increased recovery of bleed water from the Air Supply House.

TMCA also conducts activities to encourage water-saving among employees in Melbourne, such as teaming up with local Water Authority City West Water to establish the Target 155 Club, a community program to encourage staff to keep household water use to 155 liters per person per day.



[Substances of Concern]

**TSAM Participates in Regional VOC Conference, Horizontally Developing Kaizen**

**South Africa: Toyota South Africa Motors (Pty) Ltd. (TSAM)**

Toyota has designated regional "model factories" in its effort to achieve its FY2010 VOC reduction target. The first Asia Pacific Conference on VOCs at was held at Toyota Kirloskar Motors (TKM) in Bangalore, India, in September 2008 with representatives from subsidiaries' environmental divisions and paint shops. During the conference, they shared kaizen examples on reduction of VOCs.

At the conference, the participants learned Key Performance Indicator (KPI) benchmarking information on the body and bumper painting processes—particularly paint and thinner usage, thinner recovery rates, color change percentages and repaint ratios.

They discussed *kaizen* initiatives and gathered information to feed back to their plants on issues such as recovery improvements, robot flushing optimization, standardized process controls, new technologies in robot cleaning, sealer recycling and team member involvement in VOC reduction efforts.



Participants at VOC Conference



[Recycling of Resources] [Environmental Management]

**Teda Plant in North China: Measures for Water Resources and Creation of Eco Park**

**China: Tianjin FAW Toyota Motor Co., Ltd. (TFTM)**

In China, in contrast to the southern region, the northern region is predominantly dry with a low amount of rainfall. In addition, the water use in the region has drastically increased due to a concentration of population and an improvement in living standards, so water shortages have become quite serious. TFTM that has a large automobile manufacturing plant in Tianjin City, in the north of China, started advanced water purification treatment of domestic wastewater (300,000 tons per year) in the Teda Plant in January 2010. The treated water is used for sprinkling over plants.

In addition, a new eco park was constructed on the plant site, and employees enjoy comfort and ecological relief at the park as a resting area. In June 2010, TFTM was constructed the Lizhi Open Space, a waterfall which reuses domestic water, and natural ecological park comprising of a pond, an

island with cherry trees and a marshy area. Solar and wind power are used for an illumination system at the open space under the basic concept of creating a low-carbon society. Plant wastewater meets the environmental standards for reuse of water for urban landscapes. Various kinds of trees such as cherries and willows are planted on the island, and the roots of aquatic grasses planted in the marshy area purify water and absorb organic substances, and so on to improve the soil environment.



Waterfall using gray water

[Environmental Management]

**Promoting Initiatives on to the Environment in Cooperation with Suppliers in China**

**China: Toyota Motor (China) Investment Co., Ltd. (TTCI)**

Subsidiaries targeted for the consolidated management system in China always seek for leading edge technology, and provide high-quality, innovative products and services.

The China Environment Committee was established in March 2007. Since then it has strived for the improvement of the environmental performance in such areas as the response to and giving direction on approaches to the environment, as well as confirmation of progress.

As part of the approaches to suppliers in China, the China Green Purchasing Guideline, which is matched to situations in China, was formulated based on the Toyota Green Purchasing Guideline issued in 2006. It has been used by about 400 suppliers of parts and components, supplies, raw materials,

resources, facilities and construction, cleaning and landscape gardening and logistics. The briefing session of the China Green Purchasing Guideline was held targeting supplies from FY2008. In FY2010, the session was held for about 230 companies, by dividing into three sections to explain about trends in regulations in China and requests for a response to the environment.



[Environmental Management]

**New Plant, Aiming to Make it the No.1 Environmental Performance and Sustainable Plant in Brazil**

**Brazil: Toyota de Brasil Ltda. (TDB)**

A plant manufacturing a compact family car is under construction in the city of Sorocaba, 90km west-northwest from Sao Paulo, with operation slated to begin in September, 2012. The area surrounding the Sorocaba Plant is grazing land. The aim is to make it the No.1 environmental performance and sustainable plant in Brazil. The new plant will (1) reduce CO<sub>2</sub> by production line changes such as a compact and slim line, introduction of new innovative body painting technology using no steam, and decentrally placed compressors; (2) reduce VOC by water-borne paint for primer and top coats (base and clear); and (3) reduce water consumption through the introduction of a waste water recycling system.

In addition, as part of the afforestation program at the plant—one of the key elements for sustainability, around

125,000 endemic species such as trees and ferns will be planted over a 79 ha area, which accounts for 20% of the total area site. In an effort to further contribute to the community, trees will be planted over a 60.03 ha area around the plant, the flora will be monitored, and an biodiversity park and environmental educational facility will be constructed at the same time.

In advance of the start of operations, Toyota conducted internal audits to ascertain that environment-considerate construction methods were used from the outset and continued throughout the construction process.



Eco factory internal meeting





## [Environmental Management]

### Participating in COP10 Side Event under the Theme "TMT Business, Communities and Biodiversity"

#### Thailand: Toyota Motor Thailand Co., Ltd. (TMT)

TMT Senior Vice President Ekachai Ratanachaiwong was invited by the United Nations University to take part in a side event of the 10th Conference of the Parties (COP10) on October 23, 2010 in Nagoya, Japan by delivering a lecture.

The United Nations issued the invitation for the side event because he is one of the key partners in the UN Regional Centre for Expertise on Education for Sustainable Development (RCE)\*. Senior Vice President Ratanachaiwong presented its work under the theme "TMT Business, Communities and Biodiversity." The objective was to build public awareness of TMT's project on eco-system conservation and biodiversity promotion.

Over 200 people participated in this side event. TMT was honored to present a joint lecture by Professor Dr. Sanit Aksornkaew, Chairman of the Executive Committee of the Sirindhorn International Environmental Park Foundation, Dr. Sonjai Havanond, Managing Director of the Sirindhorn International Environmental Park Foundation and Dr. Monthip Sriratana Tabucanon, Board Member of the Sirindhorn International Environmental Park Foundation, and an international expert on the environment, as well as SVP Ratanachaiwong. The lecture focused on TMT's Eco Forest project and Biotope center and discussed efforts to promote the Eco Forest project among TMT suppliers, dealers and local communities and the establishment of nature education centers in various provinces throughout Thailand.



\*RCE: Regional Centre of Expertise on Education for Sustainable Development

The program advocated by UN. It is a network of public and non-public educational institutes for expertise on education for sustainable development locally, and in communities.

## [Environmental Management]

### Biodiversity Education for Children in Cooperation with Environmental NGO

#### France: Toyota Motor Manufacturing France S.A.S. (TMMF)

Toyota conducts tree-planting activities around its production plants all over the world, with the aim of fostering a diverse ecosystem with forests and vegetation indigenous to each region.

Since December 2005, TMMF has partnered with CPIE Bocage de l'Avesnois, a sustainable development organization, to maintain biodiversity on the plant's grounds and to promote environmental awareness among children in the surrounding communities.

The TMMF site contains wetland areas, a retention pond and grassy areas. It is home to many different types of plant life and the wetlands make it a haven for birds. CPIE helped TMMF conduct a biodiversity inventory of the site, detailing the plants, insects and birds that inhabit the area around the plant. Every year since 2005, 10 groups of students around age 10 have visited the plant. The children first visit the TMMF plant to discover more about the manufacturing process and the plant in general. The second part of the program involves a day of activities including bird watching around the

retention pond and a food-chain awareness workshop. More than 750 children, representing 15 local schools, have visited since this partnership began.



Students learn about biodiversity near TMMF plant

This section provides an update on the progress of Toyota's environmental efforts during FY2010 (April 2010 to March 2011) in quantitative term to ensure detailed understanding. To help you understand the environmental background of the company's activities, the introduction of each item features some basic scientific background information related to that issue.

## section 1 Energy/Global Warming

According to the International Energy Agency (IEA), worldwide production of traditional crude oil is showing a turndown in an upward trend after 2020, and unconventional oil (heavy oil) output will increase in step with rising demand. While petroleum and other fossil fuels are finite resources, demand for them will continue to increase as the economies of emerging nations develop and living standards improve.

Measures for diversification of fuels has become increasingly important as development of new resources has progressed.

On the other hand, according to the U.S. National Oceanic and Atmospheric Administration (NOAA), the world's average temperature in 2010 was 0.62°C higher than the average in the 20th Century and matched 2005 as the highest since 1880.

Japan experienced its most intense summer heat wave since record-keeping began, and phenomena that indicate major climatic changes — drought in Russia, record-setting freezes in Europe and the U.S. and flooding in the Southern Hemisphere that ravaged Australia and South Africa—have occurred around the world.

Against this background, Toyota is taking proactive approaches to address energy/global warming issues through all its business activities.

On the product field, the company takes a three-pronged approach to increasing overall energy efficiency: (1) developing and promoting more fuel efficient vehicles; (2) working to electrify vehicles and diversify energy sources; and (3) making effective use of information and communication technology (ICT) such as smart grid.

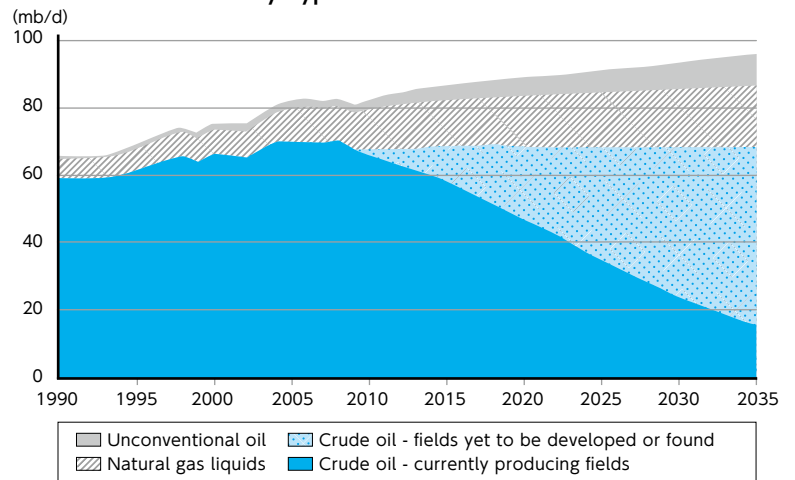
In production, Toyota is focusing on (4) low-profile energy-saving activities and (5) introduction of innovative energy-saving technologies.

In the field of logistics, (6) the company grasps CO<sub>2</sub> emissions generated from logistics activities, sets a reduction target, then and continues efforts on the reduction.



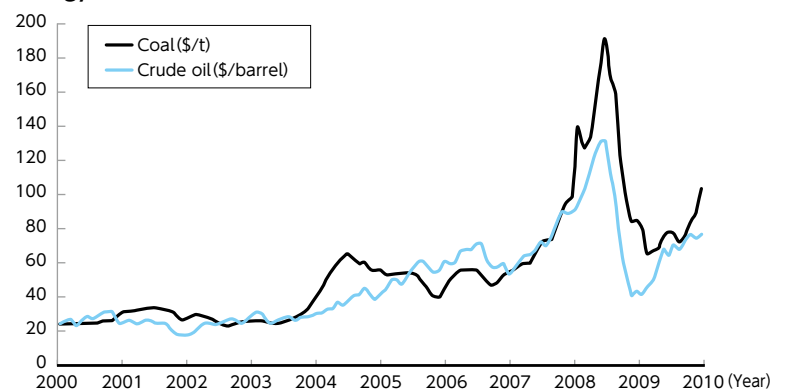
Vitz

World Oil Production by Type in the New Policies Scenario



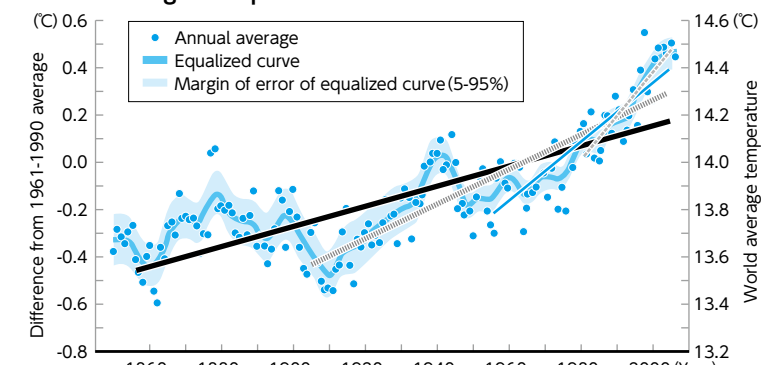
Source : OECD/IEA 2010 - World Energy Outlook

Energy and Oil Prices



Source : Annual Report on the Environment 2010 by the Ministry of the Environment

World Average Temperature



Source: IPCC.2007: IPCC Fourth Assessment Report first workshop report

\* CD: Constant Drag coefficient

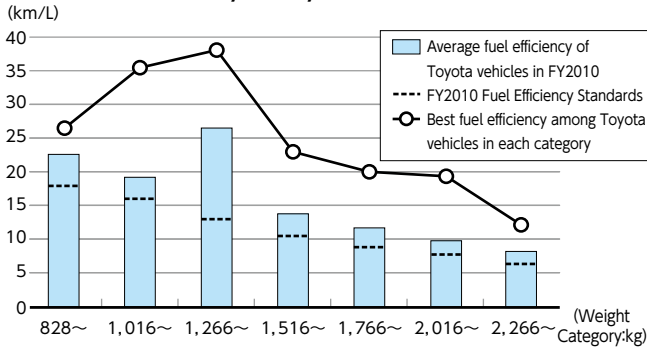
**Development and Design**

**Developing Technologies to Achieve the Best Fuel Efficiency Performance in Each Country and Region**

**All Vehicle Weight Categories Have Cleared FY2010 Fuel Efficiency Standards since 2005**

- The FY2010 fuel efficiency standards are set by weight category, and all weight categories have continued to clear since FY2005.
- Three out of four new or fully changed models for FY2010 met the FY2010 fuel efficiency standards.
- 98.2% of Toyota's gasoline-powered passenger vehicles conformed to the FY2010 Fuel Efficiency Standards (an increase of 0.4 percentage points over the previous year).

**Conformity to FY2010 Fuel Efficiency Standards and Actual Fuel Efficiency of Toyota Vehicles (km/L)**

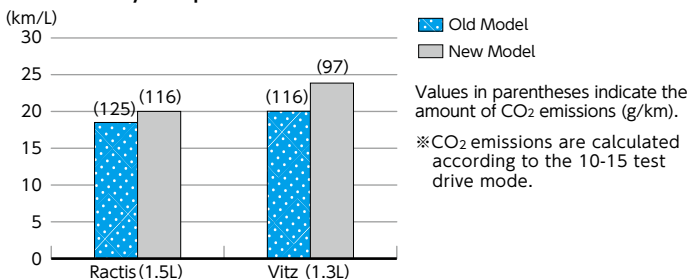


**New and Fully Changed FY2010 Models that Meet FY2010 Fuel Efficiency Standards**

Weight category (vehicle weight: kg)	Fuel efficiency standards (km/L)	FY2010 average fuel efficiency (km/L)	Qualifying new and fully changed FY2010-model vehicle series
828~1,015	17.9	22.6	Vitz
1,016~1,265	16.0	19.1	Ractis, Vitz
1,266~1,515	13.0	26.5	CT200h
1,516~1,765	10.5	13.8	
1,766~2,015	8.9	11.7	
2,016~2,265	7.8	9.8	
2,266~	6.4	8.2	

Note 1: 0.0 indicates a category that has achieved the Fuel Efficiency Standards  
 Note 2: Vehicles that achieved the efficiency standards before FY2009 are not included  
 Note 3: All fuel efficiency values are based on the Ministry of Land, Infrastructure, Transport and Tourism's Japanese 10-15 test drive mode

**Fuel Efficiency Comparison between Selected Old and New Models**



**Lexus CT200h Conforms to FY2015 Fuel Efficiency Standards**

Fifteen models including the CT200h met the FY2015 Fuel Efficiency Standards as of March 31, 2011.

Model Name	Weight Category (vehicle weight: kg)	Vehicle weight (kg)	FY2015 Fuel Efficiency Standards (JC08 mode) (km/L)	JC08 Mode (km/L)	(Ref.) 10-15 Mode (km/L)
CT200h	1,311~1,420	1,380	15.8	30.4	34.0
		1,400~1,420	15.8	26.6	32.0
	1,421~1,530	1,440~1,460	14.4	26.6	32.0

**Improvement of Fuel Efficiency through Enhanced Aerodynamics**

Toyota has worked to improve aerodynamic performance as part of a running resistance-reducing technology to help boost fuel efficiency.

For the new Vitz, wind flow was verified in minute detail, from every aspect of the exterior, including the underbody. The final design achieved a CD\* of 0.285, compared to 0.31 for the previous model.

**Increasing Adoption of Eco Driving Support System**

The Eco Drive Indicator, which helps drivers operate their vehicles in the most environment-considerate manner, has been adopted for the new Ractis and Vitz models. The Harmonious Driving Navigator system also supports eco driving and is equipped on the CT200h. These systems help motorists voluntarily reduce the environmental impact of their driving. This allows drivers to make a social contribution as they enjoy driving, while at the same time reducing fuel consumption through the practice of eco driving.

**Development and Design**

**Promoting the Development, Effective Introduction and Expansion of Clean Energy Vehicles**

**Expanding PHV Verification Tests in Japan and Overseas with the Aim of Market Launch in 2012**

In an effort to expedite market launches of plug-in hybrid vehicles (PHVs) and gain a broader understanding of their market expansion, about 230 PHVs have been introduced to Japan and about 600 to the global market since December 2009, with fleet customers in Japan, the U.S. and Europe as primary targets. In October 2010, its verification test started in Tianjin City, China.

## Continuing FCFV Demonstration Projects

Researchers face a number of hurdles to the practical use of fuel cell hybrid vehicles (FCHVs) but have made significant technological progress in two key areas—cruising range and cold starting. Development efforts now focus on addressing issues such as size, weight and FC Stack (fuel cell main unit) durability. Demonstration experiments and infrastructure building initiatives are moving forward as well.

December 2010	Supplied vehicles for a fuel cell hybrid bus line operation between central Tokyo and Haneda Airport.
January 2011	Joined an association of 13 private businesses to issue a statement pledging market introduction of fuel cell vehicles by 2015, positioning the technology as a key automotive solution for the next generation and aiming for construction of the required hydrogen supply infrastructure in four major metropolitan areas - Tokyo, Chukyo, Kansai and Fukuoka.
January 2011	Supplied a Toyota FCHV-adv for an FCV limousine service demonstration at Narita Airport.

## Development and Design

### Using Network Technologies to Improve Traffic Flow

#### Promoting Creation of a Low-carbon Society with Toyota City

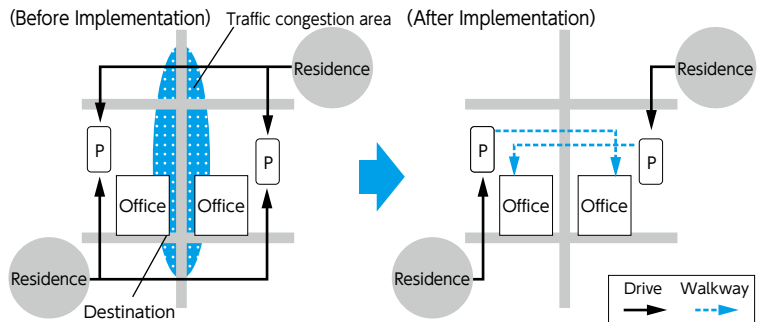
The Toyota City Low-carbon Verification Project, involving Toyota, Toyota City and 19 private-sector enterprises including Chubu Electric Power Co., Inc. was selected by Japan's Ministry of Economy, Trade and Industry (METI) as a model of its subsidy program. Its goal is to establish Household and Community-based Low-carbon City.

In August 2010, they established the Toyota City Low-Carbon Society Verification Promotion Council as the parent organization to promote the project. The council confirmed the content of a five-year action plan that outlines specific activities starting in 2010. The project targets a reduction in household CO<sub>2</sub> emissions—the primary focus—of 20% and a reduction in transportation-sector CO<sub>2</sub> emissions of 40%.

#### Integration and Optimization of Transportation Modes

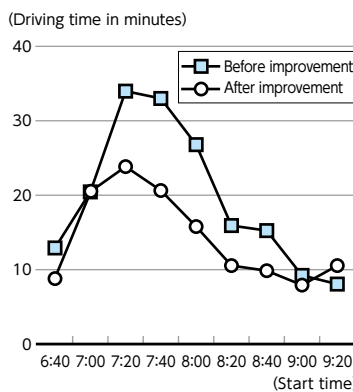
Toyota is working on part of Toyota City's initiative called "People, Vehicles and the Traffic Environment." The company introduced a zone system at the head office area's parking lots in May 2009, along with their expansion and relocation. The system includes zone designation rules based on commuting directions, encouragement of staggered commuting and so on, which together represent a comprehensive solution for improving the city's transportation environment.

#### Zone Concept

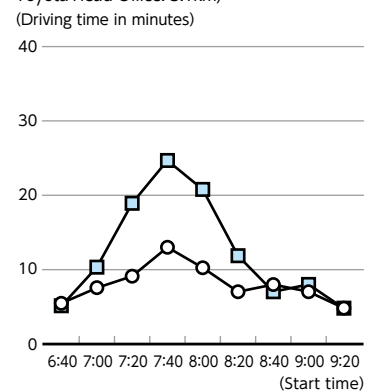


#### Traffic Status Change in Driving to Office

Outer Belt (gaikanjo) Line  
 (Residential Area - Toyota Head Office: 4.7km)



Route 248  
 (Toyota Station Peripheral Area - Toyota Head Office: 3.1km)



## Production and Logistics

### Reduction of CO<sub>2</sub> Emissions in TMC's Production Activities

**FY2010 CO<sub>2</sub> emissions reduction goal for production areas**  
 • Reduce total CO<sub>2</sub> emissions to **1.306** million tons or less

#### Reducing 4.5% from FY2009 by Merging and Discontinuance of Processes and Consolidating Production Lines

As part of the strategy to reduce CO<sub>2</sub> emissions, a new integrated goal was established for production bases and non-production bases such as offices.

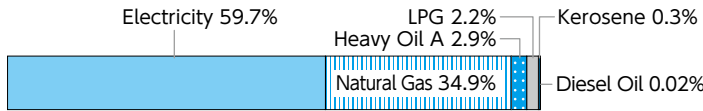
In FY2010, countermeasures such as merging and discontinuance of processes and activities to reduce total cost were taken. The resulting annual CO<sub>2</sub> emissions were 1.17 million tons, or 45% lower than the FY1990 level, achieving the goal. CO<sub>2</sub> emissions per sales unit were 142 tons per billion yen.

#### Key Measures that were Effective in Reducing CO<sub>2</sub> Emissions

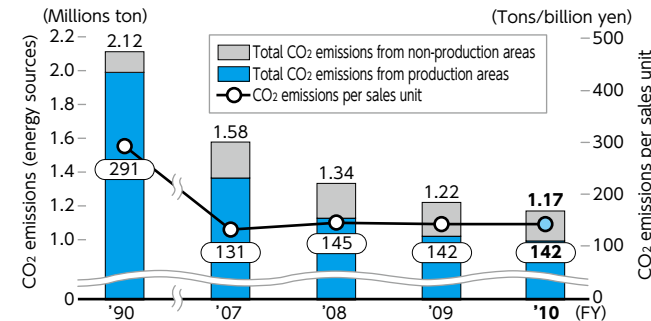
Theme to implement	Details	Reduction Volume (Thousand tons)
Merging and discontinuance of processes	Merging and discontinuance of forging processes	1.6
Activities to reduce total cost	High-efficiency operation of paint booth AHU*	3.8
Other countermeasures	Upgrading chiller	2.6

\* AHU: Air Handling Unit

**Calorific Energy Use Ratio at TMC**



**CO2 Emissions from Energy Sources at TMC and CO2 Emissions per Sales Unit**

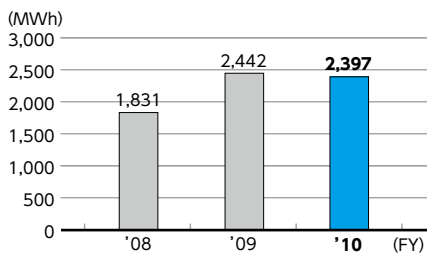


Note 1: For facilities in non-production areas for which FY1990 emissions data is not available, the oldest subsequent data available is used for the graph.  
 Note 2: CO2 emissions volume covers both production and non-production divisions (excluding Biotechnology & Afforestation Lab and employee benefit facilities).

**Promoting the Use of New Energies**

In March 2008, the Toyota Tsutsumi Plant installed a solar power generating system rated at 2,000 kW (sufficient to provide power for some 500 households). During FY2010, the system generated 2,397 MWh of electricity.

**Amount of New Energy Generated (Solar Power)**



**Production and Logistics**

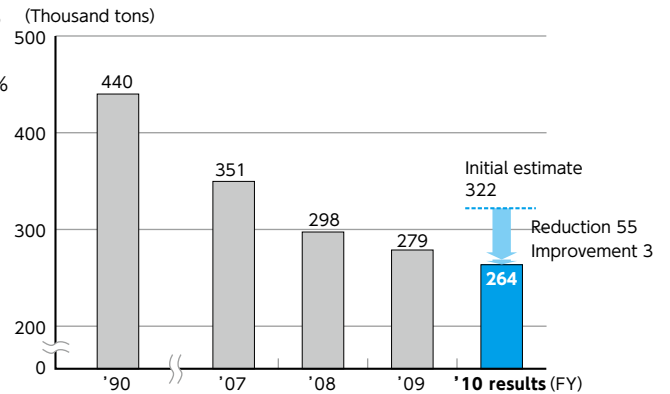
**Reduction of CO2 Emissions in the Logistics Activities of Each Country and Region**

FY2010 CO2 emissions reduction goal in logistics area (Fourth Plan Goal)  
 • Reduce CO2 emissions volume to **396,000 tons** or less (-10% from FY1990)

**CO2 Emissions Reduction Goal Achieved with Emissions of 264,000 Tons**

In FY2010, Toyota reduced CO2 emissions from logistics operations by 3,300 tons through implementing various initiatives, including activities to increase the loading efficiency of trucks, promote the modal shift and continue fuel-efficiency improvement activities taken jointly with logistics partners. In addition, a decrease in production volume in the initial plan contributed to reduced emissions. The result was total emissions volume of 264,000 tons.

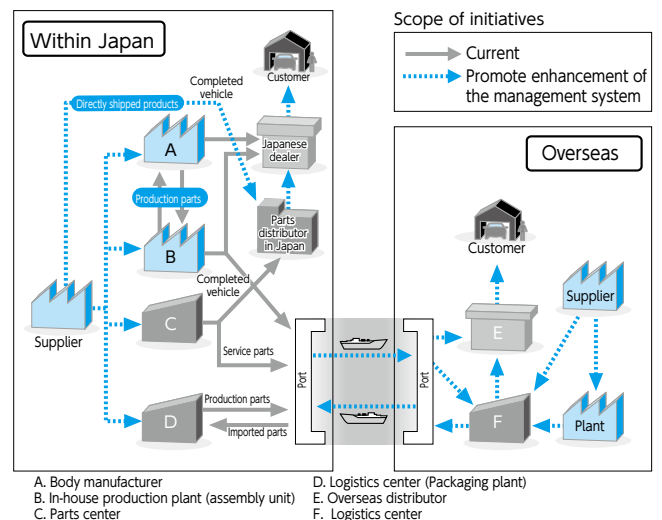
**CO2 Emissions Volumes in Logistics (Japan)**



**Result of CO2 Emissions Reduction Activities**

Topics	Products	Key improvements	Reduction in CO2 (Thousand tons/year)
Reduction in total distance transported	Production parts	Activities to increase loading efficiency, etc.	1.0
	Completed vehicles	Increased the number of vehicles to load, etc.	1.2
	Service parts	Increased loading efficiency by simplifying bumper packaging specifications, etc.	0.5
Modal shift	Completed vehicles	Increased marine transport of vehicles for dealers in Tokyo	0.6
Total			3.3

**Scope of CO2 Emissions Calculations in TMC Logistics Operations**



**Toyota Grasps CO2 Emissions Volumes and Reduction Activities at Overseas Affiliates**

Starting in FY2007, Toyota began to grasp CO2 emissions volumes at overseas affiliates and in FY2008 set targets and initiated activities to reduce emissions. In addition, Toyota is working to grasp the CO2 emissions volumes associated with marine transport among overseas regions.

# section 2 Recycling of Resources

During FY2010, public attention focused on increasing demand and geographical distribution for metal resources, such as iron, copper and nickel and tightened supplies of rare earths caused by a moderate recovery of the global economy and the continued growth in emerging countries.

With the current growth in industrialization of emerging nations such as China and India, there is an even greater possibility of restriction of resources in the future.

In addition, water, which is indispensable for production activities, becomes more important as a resource due to increasing production of agricultural products in line with

globally increasing population.

Based on the realization that all resources are limited, Toyota has promoted effective use of resources such as measures to improve yield ratios and reduce the volume of packaging materials at the production stage, and taken various initiatives on recycling.

In recent years, Toyota has also focused on reducing consumption of metals that are in danger of depletion, procuring stable supplies through new channels and at the same time recovering and recycling resources from end-of-life vehicles (so-called "urban minerals").

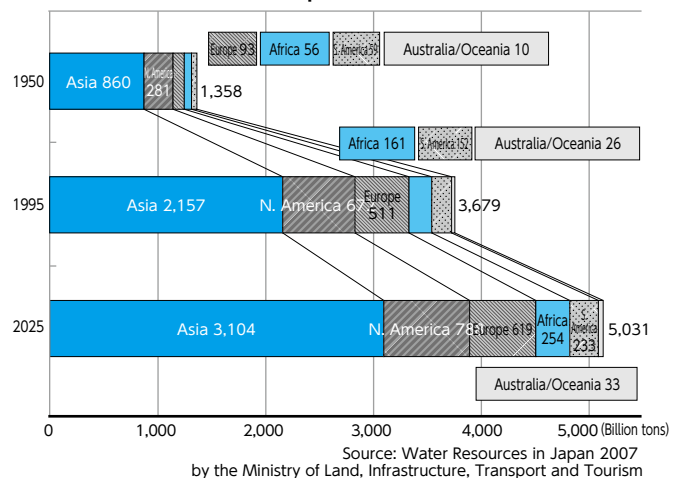
### Skewed Geographical Distribution of Nonferrous Metal Resources

Resource	2009 Major Producing Countries (based on ore production)						Top 3 Share of Total
	1st	2nd	3rd	4th	5th	6th	
Rare Earth	China	97%	India	2%	Brazil	1%	99%
Vanadium	China	37%	South Africa	35%	Russia	26%	98%
Platinum	South Africa	79%	Russia	11%	Zimbabwe	3%	93%
Tungsten	China	81%	Russia	4%	Canada	3%	89%
Molybdenum	China	39%	U.S.	25%	Chile	16%	80%
Lithium <sup>Note 1</sup>	Chile	41%	Australia	24%	China	13%	78%
Indium <sup>Note 2</sup>	China	50%	Korea	14%	Japan	10%	74%
Lead	China	43%	Australia	13%	U.S.	10%	67%
Manganese	China	25%	Australia	17%	South Africa	14%	55%
Zinc	China	25%	Peru	13%	Australia	12%	50%
Copper	Chile	34%	Peru	8%	U.S.	8%	49%
Nickel	Russia	19%	Indonesia	13%	Canada	13%	44%

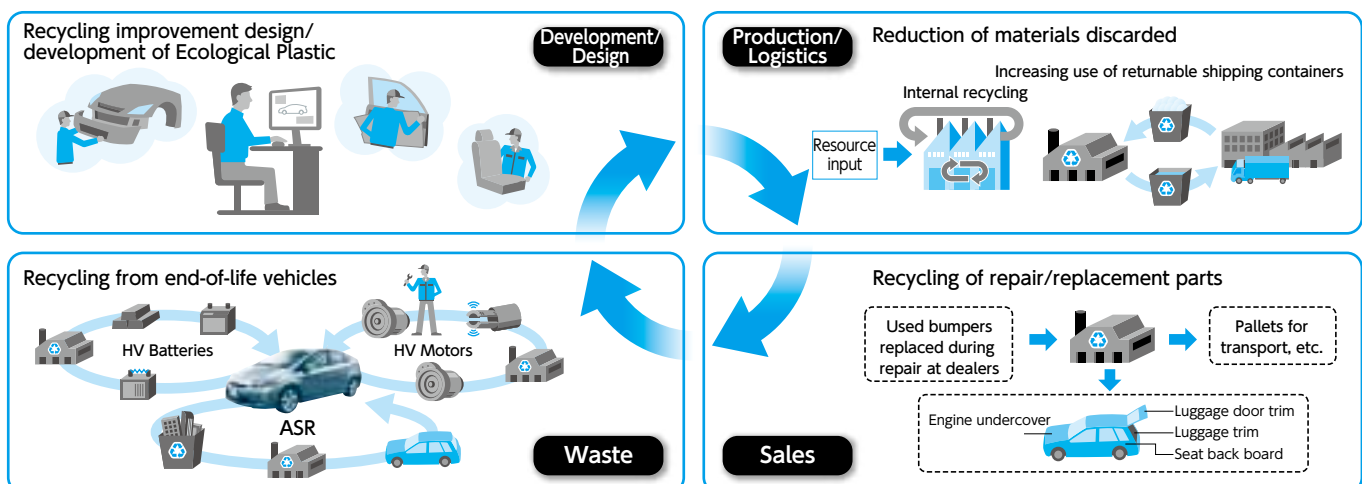
Note 1: Excluding Production in the United States  
 Note 2: Based on Refinery Production

Source: Annual Report on the Environment in Japan 2010 by the Ministry of the Environment

### Transition of Water Consumption



### Concept of Car-to-car Recycling



- \*1 Resource loss: Internal recycling+Materials discarded (Waste not processed within Toyota)
- \*2 Near zero landfill waste:  
FY2000 to FY2004: A reduction in direct landfill waste to less than 5% of the FY1995 level.  
Since FY2005: A reduction in direct landfill waste to less than 1% of the FY1995 level
- \*3 Recycling for profit: Materials discarded that are sold for recycling
- \*4 Waste at cost: Materials discarded that are recycled for a fee

**Production and Logistics**

**TMC Initiatives to Further Promote the Effective Use of Resources and Contribute to the Realization of a Recycling-based Society**

**FY2010 Production Area Goals**

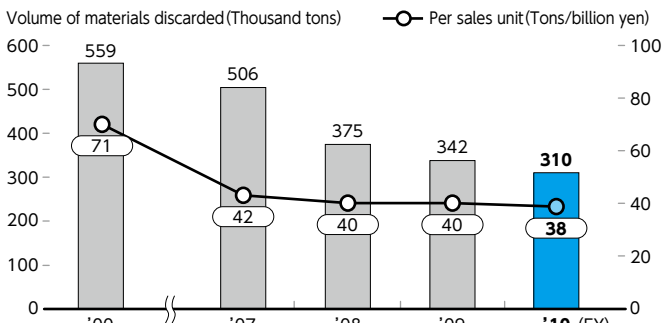
- Reduction of the volume of materials discarded to **363,000 tons or less**

**Efforts Continue to Reduce Volume of Materials Discarded, 9.4% Less than FY2009**

In order to realize effective resource utilization and thereby build a recycling-based society, it is necessary to promote comprehensive reduction of resource loss beyond recycling for profit and internal recycling.

The volume of materials discarded in FY2010 was 310,000 tons, or 9.4% less than the previous fiscal year, through improvements in yield ratio and other measures, and the resulting volume of materials discarded per sales unit was 38 tons/billion yen, or 5.5% less than the previous fiscal year.

**Materials Discarded and Volume per Sales Unit**



(Note) Volume of materials discarded covers both production and non-production divisions (excluding employee benefit facilities)

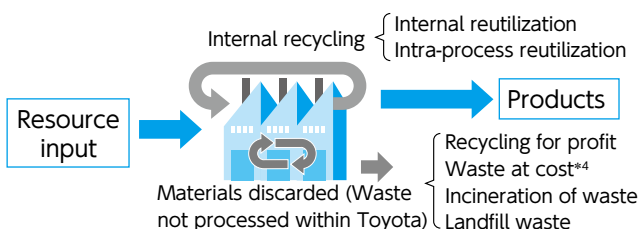
**Key Activities to Reduce Materials Discarded**

FY2003	Achieved nearly zero landfill waste*2 at non-production sites
FY2006	Set goal to reduce materials discarded including recycling for profit*3

**Effective Countermeasures for Materials Discarded Reduction**

Theme	Measures	Reduction (Thousand tons)
Measures for improvements in yield ratio	Improvements in yield ratio for new model press work	3
	Improvements in yield ratio for forging parts	0.4

**Resource Flow**



**FY2010 Goals in Logistics Area**

- Reduce usage of packaging and wrapping materials to **58,700 tons or less**

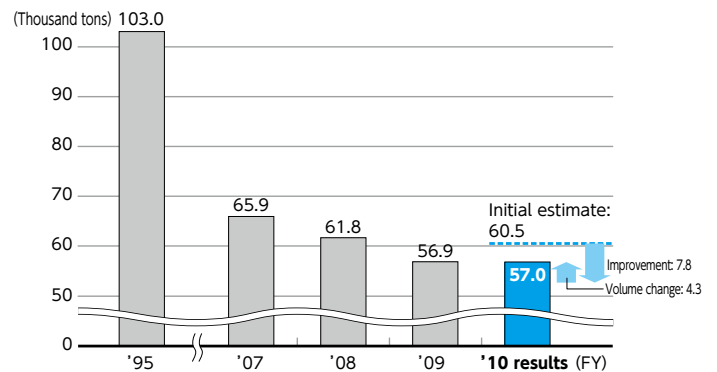
**Goal Met through Activities to Reduce Usage of Packaging and Wrapping Materials**

In order to reduce the use of packaging and wrapping materials, Toyota implemented measures that included simplifying wrapping specifications (e.g., reducing wrapping materials for bumpers) and expanding the use of returnable shipping containers.

As a result of these measures, despite impacts on volume changes, etc., total usage decreased by 7,800 tons to 57,000 tons, thus achieving the goal for FY2010.

In FY2008, Toyota began to grasp its global use of packaging and wrapping materials, and has already completed the assessments for all regions excluding North America and Europe. Toyota plans to expand the scope of its assessment to every part of the world in FY2011.

**Use of Packaging and Wrapping Materials by TMC (Japan)**



**Results of Activities to Reduce Packaging and Wrapping Materials**

Topics	Products	Details	Reduction (Thousand tons/year)
Increasing lean specifications for wrapping, etc.	Service parts	Increasing lean specifications for wrapping	5.0
	Production parts	Changing packaging specifications, reuse, etc.	1.3
Increasing returnable containers	Service parts	Expanding the use of returnable containers (expanding items and destinations - to Thailand)	0.5
	Production parts	Expanding applications of returnable containers (diversifying container sizes, etc.)	0.5
Total			7.8

\*1 ASR (Automobile Shredder Residue): Waste from shredded end-of-life vehicles

\*2 Vehicle recycling/recovery rate: Calculated as the approximate 83% recycling rate of materials recovered from the dismantling and shredding processes (as per documentation of the policy board of Japan, May 2003), plus a 85% ASR recycling/recovery rate of the 17% ASR remaining after recycling of materials recovered from the dismantling and shredding processes [85 + (85/100 x 15) = 97.75]

\*3 EFTA: Switzerland, Norway, Iceland, Liechtenstein

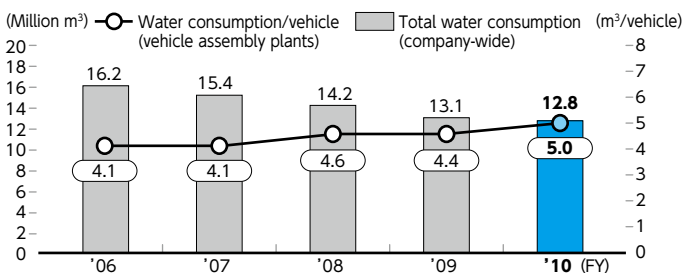
**Production and Logistics**

**Reduction of Water Consumption at TMC**

**Efforts Continue to Reduce Water Consumption (2.6% Reduction over FY2009)**

The total water consumption in FY2010 was 12.8 million m<sup>3</sup>, or 2.6% reduction over the previous fiscal year, due to continuous reduction activities. Meanwhile, water consumption per vehicle produced was 5.0m<sup>3</sup>, (a 13% increase from the previous fiscal year) due to decrease in number of units produced.

**TMC Total Water Consumption and Consumption per Vehicle Produced**



Note 1: Water consumption includes the volume consumed at both production and non-production divisions (excluding employee benefit facilities)  
 Note 2: Water consumption per vehicle produced indicates the consumption per vehicle produced at vehicle assembly plants

**Recycling**

**Steady Implementation of Recycling Systems in Japan and Europe**

**Ensuring a Proper Response to the Automobile Recycling Law in Japan**

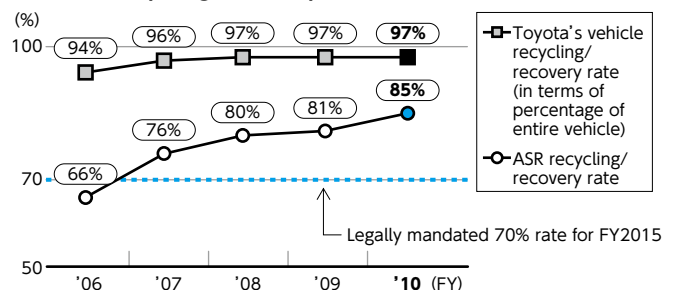
Toyota has been steadily working with dismantling and recycling companies to ensure compliance with the Law Concerning Recycling Measures for End-of-Life Vehicles (Automobile Recycling Law: effective January 2005). The law mandates automotive manufacturers with collection and recycling/recovery of specified items generated from end-of life vehicles: CFCs/HFCs, airbags and ASR\*<sup>1</sup>. Toyota is duly carrying out its recycling duties.

The ASR recycling/recovery rate of Toyota reached 76% in FY2007, surpassing the legally mandated rate of 70% for FY2015, and rose to 85% in FY2010. In addition, the vehicle recycling/recovery rate\*<sup>2</sup>, converted into a per-vehicle value, reached 97%, exceeding the Toyota Recycling Vision's goal of 95%.

**FY2010 Results of Recycling and Recovery**

		Results
No. of vehicles collected for ASR		974,000
No. of vehicles collected for airbag recovery		557,000
No. of vehicles collected for CFC/HFC recovery		801,000
Recycling/recovery rate	ASR	85%
	Airbags	94%

**Toyota's Vehicle Recycling/Recovery Rate and ASR Recycling/Recovery Rate**



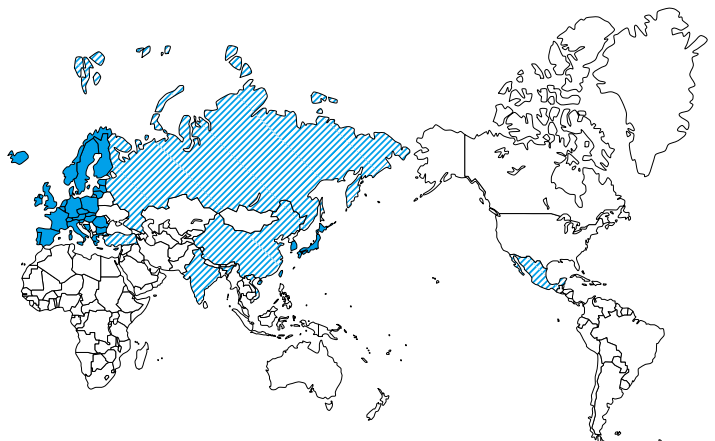
**Compliance with Automobile Recycling Laws Overseas**

All EU member states have enacted automobile recycling laws based on EU ELV Directive of 2000, and as of January 2007 automakers started to take back end-of-life vehicles (ELVs) in most member states. In cooperation with TME and distributors in various member states, Toyota has completed construction of a network ELV collection in 23 of the 27 EU member states, and is proceeding with the necessary action in the remaining four member states in accordance with government authorization of dismantlers.

In other countries around the world, Toyota is diligently pursuing similar responses, working closely with its distributors to ascertain local regulatory trends and studying local infrastructure in each country.

**Legislation Status**

Status	Country/Region	Legend
Enacted	EU, EFTA* <sup>3</sup> , Japan, Taiwan, Korea	
Under Study	Russia, India, China, Mexico, Turkey, Vietnam	



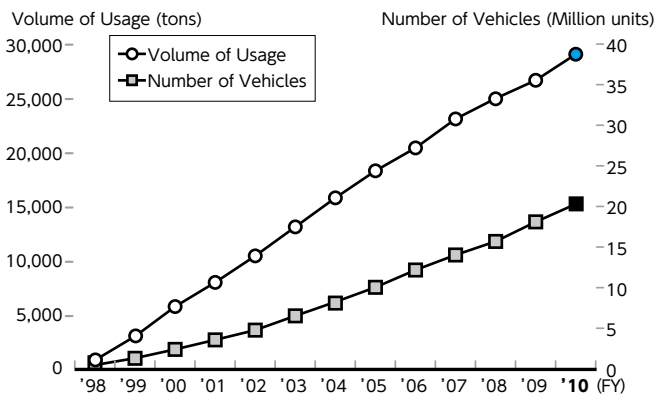


## Promotion of ASR Recycling and Further Advances

### [Development of RSPP]

Toyota has implemented a recycling process to sort out used urethane foam and fiber materials—the most bulky component substances in shredder dust—for use as Recycled Sound-Proofing Products (RSPP), which have appropriate air layers, in various new car applications. The process yields a completely new high-performance material that offers a better mix of sound-absorbing and sound-isolating features compared to conventional formulations and has been used in some 20 million vehicles up to FY2010.

### RSPP: Cumulative Volume of Usage and Number of Vehicles



## Steady Progress in Recycling at Dealers and Parts Distributors

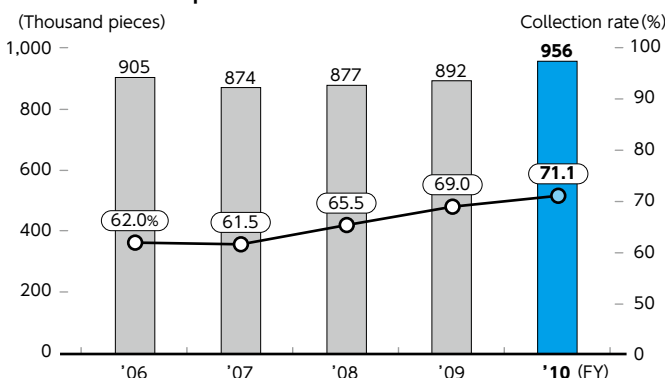
### [Promoting the Collection and Recycling of End-of-life Parts]

Parts distributors and dealers nationwide have conventionally played important roles in the resource recycling loop, addressing the recovery of such used parts as bumpers and lead wheel balance weights, using tank trucks instead of drums to transport oil and distributing used parts.

### FY2010 Results of the Collection and Recycling of End-of-life Parts

Bumpers	956,000 (Collection rate 71.1%)
Lead wheel balance weights	37.1t
Amount of oil delivered using tank trucks (in the bulk supply system)	59.0% of the total

### Number of Bumpers Collected



## [Supply of Used and Rebuilt Parts]

### FY2010 Supply of Used and Rebuilt Parts

Parts Name	Number supplied		
	Used Parts/Rebuilt Parts	New Parts (Ref.)	
Rebuilt parts	Automatic transmissions	6,505	72
	Power steering units	10,556	6,302
	Torque converters	4,446	5,746
Used parts	62,057	—	

## Steady Promotion of Hybrid Vehicle Battery Collection and Recycling

Toyota has built and operated a nationwide battery collection and recycling system since the launch of the first-generation Prius in 1997 in order to ensure safe recovery and processing of hybrid-vehicle batteries and proper recycling of resources. In October 2009, the Toyota HV Call Center was established and collects battery units. In FY2010 the Center collected 5,654 units. Those units were sent to Toyota Chemical Engineering Co., Ltd., where their nickel components are recycled as material for stainless steel after reduction processing. Toyota has also worked on battery-to-battery recycling since October 2010.



HV vehicle battery removal training program

## ▶ Recycling

## Further Promotion and Widespread Application of the Design for Recycling Concept

### Development of Vehicles with Improved Dismantlability

In order to promote better resources recycling for end-of-life vehicles, it is necessary to make them easier to dismantle and recycle, with a primary focus on structural design and selection of materials. A wide range of studies on this topic have been generated and compiled.

### Recyclability Design Facts over the Past Decade

FY2003	Launched the Raum, incorporating an easy-to-recycle design
FY2006	Introduced easily removable/detachable spare tire with the LS460
FY2008	Developed a dismantling simulation system to simplify disassembly of instrument panels and wire harnesses and adopted recyclable materials
FY2009	Developed a peeling simulation system for more efficient dismantling of door trim

For details on Toyota's dismantling technologies, please visit the following Web site:

[http://www.toyota-global.com/sustainability/environmental\\_responsibility/automobile\\_recycling/development\\_of\\_dismantling\\_technologies/structure\\_to\\_develop\\_dismantling\\_technologies.html](http://www.toyota-global.com/sustainability/environmental_responsibility/automobile_recycling/development_of_dismantling_technologies/structure_to_develop_dismantling_technologies.html)

- \*1 REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals)
- \*2 CLP (Regulation on Classification, Labelling and Packaging of substances and mixtures)
- \*3 GHS (The Globally Harmonized System of Classification and Labelling of Chemicals)
- \*4 VOC (Volatile Organic Compounds)

# section 3 Substances of Concern

The World Summit on Sustainable Development 2002 led to the international agreement that the impact of chemical manufacture and use on human health and the environment should be minimized, and follow-up actions are under way.

It is said that today there are approximately 100,000 varieties of chemical substances being manufactured and sold throughout the world.

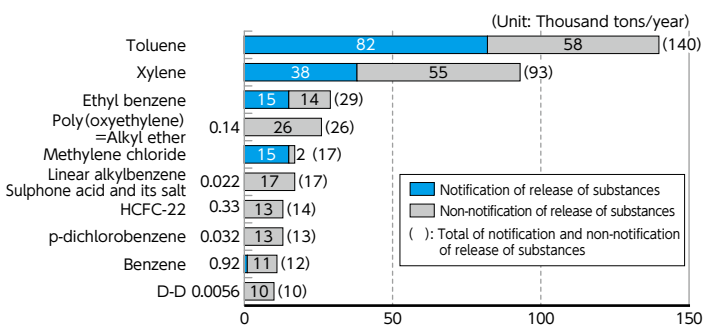
Nations around the world are driving regulations to prohibit the use of hazardous substances. In recent years, however, there has been a growing recognition that companies using chemicals should be responsible for assessing the risks and establishing appropriate management on their use. Under these circumstances, companies are required to (1) fully understand the chemicals they use and assess their risks, (2) respond appropriately to the risks and (3) ensure information disclosure to the government and society.

Toyota has continuously reduced chemical discharges from manufacturing plants according to the Pollutant Release and Transfer Register (PRTR) Law. Furthermore, complying with an amendment to the PRTR law, the number of substances subject to it has increased since FY2010. The social demands for reducing substances of concern are thus surging.

Toyota has addressed the reduction of product-contained hazardous substances in cooperation with supply chain partners.

The company will make continuous efforts to minimize the impacts from chemical substances both in production process and finished products.

## Emissions of Top 10 Notification/ Non-notification Release of Substances (FY2008)



Source: Annual Report on the Environment in Japan 2011 by the Ministry of the Environment

## Development and Design

### Promote Management of and Further Reductions in the Use of Substances of Concern

#### Management and Reduction of 4 Key SOCs

##### Status of Actions on 4 Major SOCs

4 SOCs	All Production in Japan	Key Overseas Plants
Lead, Mercury, Cadmium and Hexavalent Chrome	All eliminated since August 2006	Almost all eliminated since the end of 2007

## Ensuring Conformity to the Chemical Substance Regulations: e.g. REACH/CLP

### Status of Compliance to Chemical Substances Regulations

Regulation	Overview	Compliance Status
*1 REACH	The European regulation REACH clearly seeks corporate responsibility for management of chemical substances. REACH requires companies to fully understand the properties of the chemicals they use and assess their risks. Toyota has complied fully with these obligations by completing pre-registration in 2008 and the registration in 2010.	Full Compliance
*2 CLP	The CLP regulation enacted in 2009 standardizes classifications, labeling and packaging of chemical substances in the framework based on the international coordination rule GHS <sup>3</sup> . This regulation requires chemical product manufacturers and importers in Europe to notify the hazard classification of their chemical materials to the relevant authority and to label them accordingly. Toyota completed all the required procedures for chemical substances being imported by European affiliates before the January 2011 deadline.	

## VOC Levels within Vehicle Cabins Reduced in All New and Fully Changed Models

It is generally accepted that, of VOC\*4 emitted by vehicle interior parts, toluene, xylene and formaldehyde may have a particularly detrimental effect on human health. In order to reduce the amount of VOCs generated, Toyota is continuing to review the materials, processing methods and adhesives used for interior parts.

New Models and Fully Redesigned Models for FY2010	Compliance Status
Ractis, FJ Cruiser, Vitz and CT200h	Achieved voluntary goal of the Japan Automobile Manufacturers Association

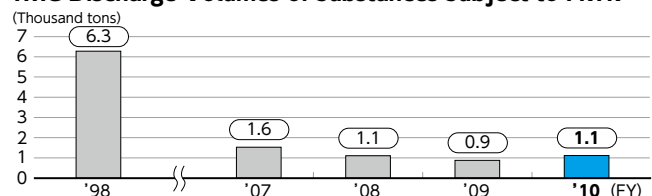
## Production and Logistics

### Reduction of the Discharge of Substances Subject to PRTR due to TMC Production Activities

#### Reducing Discharge Volume of Substances Subject to PRTR

In FY2010, Toyota reduced usage and improved recovery rates for cleaning solvents and moved forward on water purification of cleaning solvents for waterborne paints. Annual discharge volume totaled 1,100 tons, a 30% increase from the previous year, as amendments to PRTR have broadened the range of substances subject to regulation since FY2010.

#### TMC Discharge Volumes of Substances Subject to PRTR



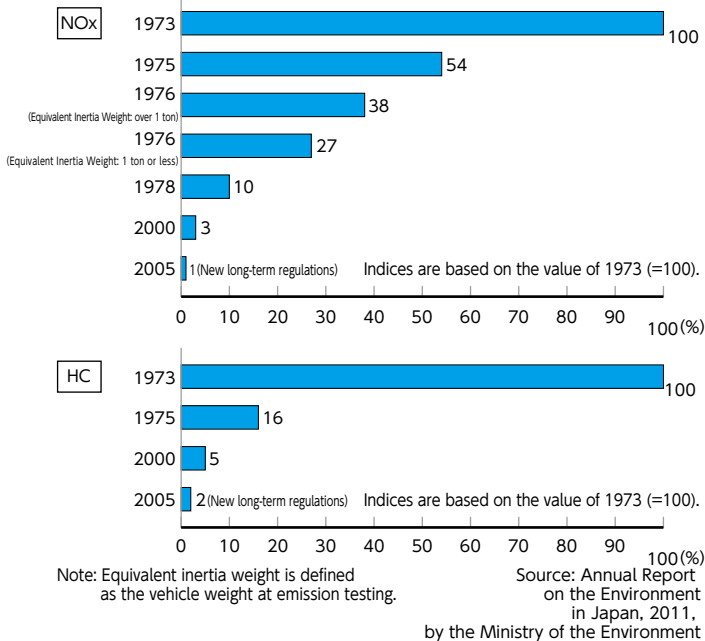
# section 4 Atmospheric Quality

There are two main sources of atmospheric pollution: stationary sources such as factories and businesses, and mobile sources such as automobiles. In Japan, significant steps in reduction of atmospheric pollution have been made, and pollutants in automotive exhausts have greatly been reduced.

Seeking to preserve a clean atmospheric environment, Toyota developed low emissions technologies at every level — (1) development and design, (2) production and logistics. In FY2010, almost all Toyota automobiles achieved Ultra-Low Emission Vehicle (U-LEV) certification, or better, and VOC emissions in the production painting process were reduced even further.

Toyota is continuing to develop low emissions technology, implement that technology on a global level and reduce VOC emissions.

## Gasoline/LPG-powered Passenger Car Regulation Reinforcement



## Development and Design

### Reduction of Emissions to Improve Air Quality in Urban Areas in All Countries and Regions

Percentage of Total Production in FY2010 that Meets the Approval System for Low-emission Vehicles Based on the 2005 Exhaust Emissions Standards

Category	Reduction level	Percentage of total production
New ☆☆☆ U-LEV	50% lower than standard levels for 2005	4.5% (29)
☆☆☆☆ SU-LEV	75% lower than standard levels for 2005	95.1% (134)

( ) No. of models

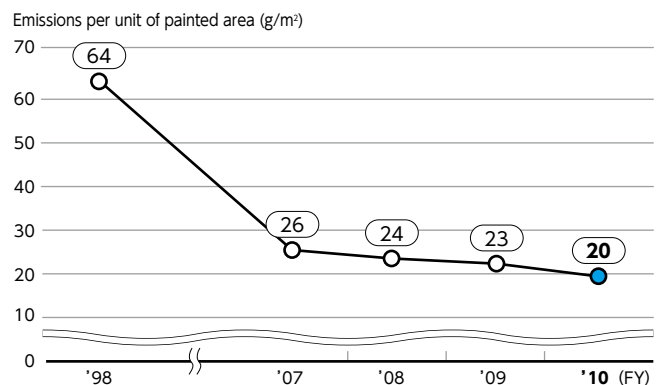
## Development and Logistics

### TMC's VOC Emissions Reduction Activities

#### VOC Emissions from Paint Reduced by 3g/m<sup>2</sup> to an Average of 20g/m<sup>2</sup> in Body Painting Processes

In FY2010, Toyota promoted to use less solvent in washing processes and recapture a larger percentage and use deionized water (DI water) for washing instead of waterborne cleaning solvent. As a result of these VOC reduction activities, total VOC emissions from Toyota body paint lines averaged 20g/m<sup>2</sup> in FY2010 (a reduction of 13% from the previous fiscal year).

#### VOC Emissions Volumes in TMC Vehicle Body Painting Processes (Average for All Lines)



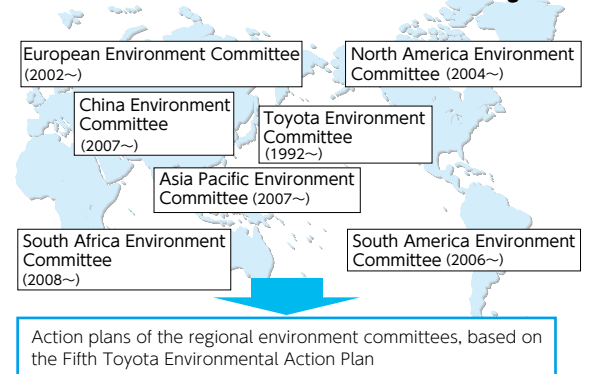
# section 5 Environmental Management

Toyota positions the environment as a key management issue and thus promotes business that is concerned with the environment.

From the standpoint of “more Toyota people should take the initiative in concern for the environment,” the scope of our programs covers not only consolidated subsidiaries, but also voluntarily participating non-consolidated affiliate companies and production companies, for a total of 558 firms. This total covers 99% of the number of vehicles produced and 93% of the number of vehicles sold.

The Fifth Toyota Environmental Action Plan (FY2011-FY2015) was formulated in FY2010. We will further enhance our initiatives concerning the environment, while cooperating with regional environment committees, aiming at achievement of TMC and regional objectives. Below we have listed the commitments of the chairmen of the regional environment committees and their action plans.

## Promotion Structure for Global Environmental Management



### Management

## Enhancing Consolidated Environmental Management

### Regional Activities and Directions

#### Europe

##### A Message from Chairman

We need to address carbon dioxide, air quality, resource efficiency, chemical substances, and recycling as part of our roadmap towards 2020 and to be aligned with the EU ambitions to decarbonize society in the long run.



Didier Leroy  
 President & CEO  
 Toyota Motor Europe (TME)

##### Popularization of HV and PHV

The main focus concerning low carbon society is the popularization of petrol hybrid & the introduction of plug-in-hybrid vehicles. Full hybrid is to become the mainstream technical solution for all core models, to reduce emissions and dependency on fossil fuels. This should be recognized by consumers. HV technology combined with vehicle and fuel technology is to achieve the best fuel economy, CO<sub>2</sub> levels, and air quality levels in the industry. The 2nd focus is resource efficiencies: reduce the use of energy & emissions at all sites, reduce waste and use of water, while optimizing recycling.

#### North America

##### A Message from Chairman

The environmental, economic, and social cost of petroleum use will continue to dominate policy debate and impact daily life in North America. We must offer sustainable solutions for this challenging issue.



Yoshimi Inaba  
 President & COO  
 Toyota Motor North America (TMA)

##### Expanding Hybridization

Recognizing that hybrid technology offers an immediate way to significantly improve fuel efficiency and reduce CO<sub>2</sub> levels, we will expand the Prius into a family of vehicles that will launch in CY2012. This will include a Prius that plugs in to operate on grid electricity without the range limitations of a pure EV. Through demonstration programs, we will prepare consumers for plug-in vehicles and gain insight on how they are actually used. Finally, we will study an expanded end-of-life recovery program for batteries, electric motors, inverters and other advanced technology components.

## South America

### A Message from Chairman

We established a five-year action plan for South America, aiming to be in frontier on environmental care. We expect to expand our operations in the region, respecting the environment.



Shunichi Nakanishi  
President, Mercosur Toyota (MST)

### Environmental care at dealers

We started environmental activities with dealers in 2006, and our pillars are first DERAP (Dealer Environmental Risk Audit Program, which defines five minimum requirements that dealers should comply with) and then ISO14001 certification. By 2015, our plan is to reach:

	Target (No. of dealers acquired/No. of target dealers)	
	DERAP	ISO14001
Argentina	90%	90%
Brazil	85%	40%
Venezuela	100%	3 model dealers

## Asia Pacific

### A Message from Chairman

Natural disaster occurs more severely and more frequently. Thus, AP Env. Action Plan (FY2012-2016) aims to run business in harmony with nature. CO<sub>2</sub> reduction and the Eco Forest are part of the activities that will create a sustainable balance.



Takahiro Iwase  
President, Toyota Motor Asia Pacific Engineering & Manufacturing (TMAP-EM)

### AP CO<sub>2</sub> Reduction Across the Value Chain

CO<sub>2</sub> emissions are a major cause of global warming, which stimulates more severe natural disasters such as flooding in several countries, etc. In AP region, we are enhancing CO<sub>2</sub> reduction across the value chain, covering manufacturing, suppliers and dealers, and we are also raising awareness of the importance of the Eco Forest one million native trees project and promoting the use of organic substances, which can result in biodiversity and unification of humankind and nature. This may finally create a balance between the cycles of nature and industry in the near future.

## China

### A Message from Chairman

In China's rapidly growing automobile market, we maintain a strong consciousness of the global environment and take action in consideration of the environment through the newly formulated the China Environmental Plan.



Akira Sasaki  
Vice Chief Executive Officer  
Toyota Motor (China) Investment (TMCI)

### Enhancing Environmental Management System

In production and logistics areas, same as other regions, we set per-unit targets and promote activities to reduce the environmental impact and address issues such as global warming and depletion of resources. We will further promote initiatives to reach the top level in the world through activities that visualize environmental impact and eliminate *muda*, *mura*, and *muri*. All production plants acquired ISO14001 environmental management standards, but we will upgrade the environmental management system level, not only to conform to regulations, but also to further improve quality. We will also further enhance checking of *genchi genbutsu* at the China Environment Committee, reinforce deployment of good examples of initiatives, and then steadily promote programs in other areas such as sales and recycling as well as production and logistics.

## South Africa

### A Message from Chairman

We are moving toward our aim to be the regional environmental leader, and the efficient use of resources is of special importance to us in our Environmental Action Plan.



Johan van Zyl  
President & CEO  
Toyota South Africa Motors (TSAM)

### Energy Reduction in Production

We are experiencing significant increases in the cost of electricity to fund projects aiming at increasing the electricity supply. This poses a cost challenge but also an opportunity to implement actions that will result in an energy efficient production operation and subsequent improved environmental performance. We will improve "just in time energy" under the slogan "No Work - No Watt." Energy efficiency will also be improved by studying potential energy efficiency projects prior to implementation and confirming improvements. Feasible projects will be rolled-out to all our operations.

## FY2010 Consolidated Environmental Management Action Policies and Results

In FY2010, Toyota promoted initiatives to ensure the achievement of annual environmental goals in production, sales and other areas. In the area of production, systematic measures were implemented and almost all goals were achieved. With respect to sales and other areas, each company formulated annual environmental action plans and promoted initiatives based on these plans.

		FY2010 Action Policy And Results			FY2011 Action Policy	
		Action Policy	Goals	Activity Results	Action Policy	Goals
<b>Overall</b>		<ul style="list-style-type: none"> <li>Enhance independence of regional environmental committees and further strengthen cooperation between TMC and each regional committee</li> </ul>	<ul style="list-style-type: none"> <li>Hold periodic regional environmental committee meetings by region</li> </ul>	<ul style="list-style-type: none"> <li>Held periodic regional environment committee meetings                      European Environment Committee: 4                      China Environment Committee: 2                      Asia Pacific Environment Committee: 2                      South America Environment Committee: 2                      South Africa Environment Committee: 2                      North America Environment Committee: 1</li> </ul>	<ul style="list-style-type: none"> <li>Enhance environmental management to strengthen cooperation with each region</li> </ul>	<ul style="list-style-type: none"> <li>Hold periodic regional environment committee meetings, and launch the Fifth Toyota Environmental Action Plan smoothly</li> </ul>
Production (78 companies)	Japan (35 companies)	<ul style="list-style-type: none"> <li>Strengthen activities to prevent non-compliance, complaints and reoccurrence of problems</li> <li>Strengthen initiatives through environmental meetings in Japan and regional environmental committees toward achieving the FY2010 goals</li> <li>Follow up creation of the five-year action plan (FY2011-FY2015)</li> </ul>	<ul style="list-style-type: none"> <li>Zero non-compliance and complaints</li> <li>All companies to achieve FY2010 goals</li> <li>Create by all relevant companies</li> </ul>	<ul style="list-style-type: none"> <li>Proactive preventive measures were implemented, but there were cases of minor non-compliance (13 non-compliance cases* and 0 complaints). All relevant response measures were completed.                      *: Japan: 7, Overseas: 6</li> <li>All relevant companies implemented systematic measures to achieve FY2010 goals and almost all goals were achieved</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen activities to prevent non-compliance and complaints</li> <li>Ensure absolute achievement of goals through environmental meetings in Japan and overseas</li> </ul>	<ul style="list-style-type: none"> <li>Zero non-compliance and complaints</li> <li>All companies to achieve FY2011 goals</li> </ul>
	Overseas (*43 companies)					
Sales (79 companies)	Japan (33 companies)	1) Ensure follow-up of FY2009 activity results and creation of FY2010 action plan	<ul style="list-style-type: none"> <li>Achieve FY2010 plan goals</li> </ul>	<ul style="list-style-type: none"> <li>All companies created their respective annual action plans and are promoting implementation</li> </ul>	<ul style="list-style-type: none"> <li>Ensure follow-up of FY2010 activity results and creation of FY2011 action plan</li> </ul>	<ul style="list-style-type: none"> <li>Achieve FY2011 plan goals</li> </ul>
		1) Steadily enhance initiatives based on the Toyota Dealer CSR Guidelines checklist 2) Ensure checklists are up to date based on amendments to relevant laws and recent examples of best practices In addition, examine collected information feedback	<ul style="list-style-type: none"> <li>Strengthen improvement measures</li> </ul>	<ul style="list-style-type: none"> <li>Steadily enhanced such by distributing the Dealer Good Examples of Initiatives brochure from Toyota National Dealers' Advisory Council</li> <li>Determined the framework for direction of future measures such as information feedback by enhancing tie with the Council</li> </ul>	<ul style="list-style-type: none"> <li>Determine direction toward direction for further enhancement in approaches to the environment, and launch the approaches</li> </ul>	<ul style="list-style-type: none"> <li>Zero environmental accidents</li> <li>Start trial acquisition of EMS certificate and determine the future direction</li> </ul>
		1) Ensure management by unit, and year-on-year comparison management of quantitative data	<ul style="list-style-type: none"> <li>Establish EPI</li> </ul>	<ul style="list-style-type: none"> <li>Data input by all relevant companies</li> <li>Feedback by unit data, etc. to dealers</li> </ul>	<ul style="list-style-type: none"> <li>Ensure management by unit, and year-on-year comparison management of quantitative data</li> </ul>	<ul style="list-style-type: none"> <li>Continue management data feedback</li> </ul>
	Overseas (*46 companies)	1) Continue implementation of the Dealer Environmental Risk Audit Program (DERAP)	<ul style="list-style-type: none"> <li>Goals achieved at 80% of dealers</li> </ul>	<ul style="list-style-type: none"> <li>Goals achieved at 80% of dealers</li> </ul>	<ul style="list-style-type: none"> <li>Continue implementation of the Dealer Environmental Risk Audit Program (DERAP)</li> </ul>	<ul style="list-style-type: none"> <li>Goals achieved at 80% of dealers</li> </ul>
Other (69 companies)	Japan (53 companies)	1) Ensure follow-up of FY2009 activity results and creation of FY2010 action plan	<ul style="list-style-type: none"> <li>Achieve FY2010 plan goals</li> </ul>	<ul style="list-style-type: none"> <li>All companies created their respective annual action plans and are promoting implementation</li> </ul>	<ul style="list-style-type: none"> <li>Ensure follow-up of FY2010 activity results and creation of FY2011 action plan</li> </ul>	<ul style="list-style-type: none"> <li>Achieve FY2011 plan goals</li> </ul>
	Overseas (16 companies)	2) Improve management of quantitative data	<ul style="list-style-type: none"> <li>Establish EPI</li> </ul>	<ul style="list-style-type: none"> <li>Data input by all relevant companies</li> </ul>	<ul style="list-style-type: none"> <li>Improve management of quantitative data</li> </ul>	<ul style="list-style-type: none"> <li>Establish EPI</li> </ul>

\* Including 10 production/sales companies

## Eco-factory Activities at 7 Plants

Toyota continues with Eco-factory activities for plants being newly constructed and converted or expanded on a large scale to ensure that its factories set the highest worldwide standards for environmental consideration and sustainability. Activities include on-site verification of ongoing environmental solutions in each phase—namely planning, engineering, trial production and full-scale operation—and, should a failure be discovered, corrective actions are taken and the process is re-examined. In FY2010, seven plants in North America, India, Brazil and China completed these activities.

## Eco-Factory Activities

Implementation completed (light blue) Implementation completed in FY2010 (dark blue)  
 Numbers indicate planned year of implementation

	North America	India	Brazil	China	Europe				
	TMMC Woodstock	TMMMS	TMA Plant No.2	TDB Sorocaba	GTMIC Plant No.2	SFTM Sichuan	Changchun New Plant	SFTM	TMMR
Planning stage									
Paper audit									
On-site audit		11		11			11		
Compliance and risk evaluation		11	11	12			12		
Performance evaluation (energy, VOC emissions, etc.)		12	13	14		12	14	12	

## Promoting Measures in Accordance with the Toyota Biodiversity Guidelines

Along with climate change, conserving biodiversity is one of the major environmental issues of global concern, and measures are in progress on a global scale. Toyota is taking a variety of actions under the Toyota Biodiversity Guidelines announced in March 2008. In October 2010, COP 10 (the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity) was held in Nagoya, Aichi Prefecture, where the Nagoya Protocol (on access and benefit sharing of genetic resources) and the Aichi Goals (as mid- and long-term biodiversity goals) were adopted. Toyota helped organize the pre-event, the Japan Wildlife Film Festival and distributed a *Toyota's approach to biodiversity* brochures.

Also, the "implement initiatives to address biodiversity conservation" and "promote social contribution activities that contribute to the creation of a society in harmony with nature" were newly incorporated into the Fifth Toyota Environmental Action Plan (FY2011-FY2015), a new mid-term plan announced in September 2010, and have been carried out in specific ways.

An environmental assessment is now under way on the new research and development facilities proposed for construction in a mountainous area between the cities of Toyota and Okazaki, in accordance with Aichi Prefecture's regulations. A broad range of communication activities, such as review sessions involving experts on technologies for nature conservation, briefings for local residents and public disclosure of the existing plan, have been implemented so far.

### Toyota Biodiversity Guidelines

Fundamental Approach to Activities		
TMC is aware of the importance of biodiversity and based on the Guiding Principles at Toyota, seeks the realization of a livable world, a prosperous society, and sustainable development, while taking action to support biodiversity through contributions to the automobile and housing businesses, engagement in new business enterprises, and the handling of social issues.		
Main Activities	<ul style="list-style-type: none"> <li>Contributions through technology</li> </ul>	TMC is seeking to balance biological diversity with our corporate activities by pursuing the possibilities of bio- and afforestation technologies and environmental technologies.
	<ul style="list-style-type: none"> <li>Collaboration and cooperation with society</li> </ul>	TMC aims to build collaborative and cooperative relationships with a wide range of organizations involved with biodiversity, including governments, international agencies, and NPOs.
	<ul style="list-style-type: none"> <li>Information disclosure</li> </ul>	TMC aims to contribute to the development of a sustainable society by widely sharing with society its voluntary initiatives regarding biodiversity and the results of those activities.

### Main Examples of Toyota's Biodiversity Conservation Activities

Category	Action Item	Details	Related pages
Automobile Businesses, etc.	Global warming countermeasures	<ul style="list-style-type: none"> <li>Improved global fuel efficiency</li> <li>CO<sub>2</sub> reduction in production and logistics activities</li> </ul>	12·34·35
	Response to atmospheric environment problems	<ul style="list-style-type: none"> <li>Reduction in emissions gases</li> <li>Reduction of VOC emissions</li> </ul>	13·41
	Promotion of resources recycling	<ul style="list-style-type: none"> <li>Promotion of recyclable designs</li> <li>Expansion of recyclable material use</li> </ul>	25·26·36·37·38·39
	Afforestation activities at plant sites	<ul style="list-style-type: none"> <li>Planting of trees native to the region</li> </ul>	23
	Reforestation	<ul style="list-style-type: none"> <li>Restoration of undergrowth through tree thinning (Mie Prefecture)</li> </ul>	23
Contributions to Social Issues	Consideration of a new R&D facility in harmony with community	<ul style="list-style-type: none"> <li>Preservation of habitats for rare animals and plants</li> <li>Environmental improvements around Yatsuda</li> <li>Maintenance of satoyama (mountain) forest areas</li> </ul>	※
	Human resource development and the protection of rare species	<ul style="list-style-type: none"> <li>Natural environment education at the Shirakawa Village Eco-Institute and the Forest of Toyota</li> </ul>	23
	Global afforestation	<ul style="list-style-type: none"> <li>Afforestation using native species (China, Philippines)</li> </ul>	23
	Toyota Environmental Activities Grant Program	<ul style="list-style-type: none"> <li>Initiatives focusing on biodiversity and global warming</li> </ul>	45

※For details about our environmental conservation initiatives, please visit the following Web site:

[http://www.toyota-global.com/sustainability/environmental\\_responsibility/basic\\_stance\\_on\\_the\\_environment/biodiversity\\_guidelines.html](http://www.toyota-global.com/sustainability/environmental_responsibility/basic_stance_on_the_environment/biodiversity_guidelines.html)

## Toyota Environmental Activities Grant Program Helps Balance Economic Activities and Biodiversity

Toyota set up an environmental activities grant program in FY2000 in commemoration of the company's receiving of a Global 500 award from the United Nations Environment Program the previous year. Following is an example of the grant program in action.

An Indian environmental education NGO, the Center for Environment Education (CEE), utilized the grant program to launch the "Sanjeevani Program" (named after a locally produced medicinal herb) to assist a poverty-stricken area in Gujarat State in 2007 and has produced successful results. This area used to be a symbol of biodiversity, home to 786 species of herbs. At the present, however, 251 species are in danger of extinction due to economically motivated overexploitation. During the program, demonstration herb farms are in place at 10 selected post basic schools to serve as classrooms for education and training on choices of species, cultivation, usage and distribution for teachers, students and the area's healers.

The 10 herb farms cover 22,688 square meters and have attracted a total of 4,065 trainees.



Trainees cultivating herbs on a demonstration farm

### Management

## Enhancement of Environmental Education

### Continual Systemization of Level-specific Environmental Education

Every June, during the Toyota Global Environment Month that targets all employees, a variety of events are held, and in November Toyota works on raising environmental awareness through Eco Drive Month and e-learning about the global warming issue and eco driving.

For all employee to carry out their jobs with high environmental awareness in accordance with level-specific environmental education systematized in FY2009, Toyota is putting into effect a variety of education programs according to job description and level.

### Environmental Education System

Category	Title
Employee environmental awareness improvement education	Toyota Global Environment Month Events (every June) Toyota Eco Drive Month (every November)
	·Environment e-Learning ·Environment Handbook
Education by level	New Employee Education    Manager Education
	Executive Development Program
Specialized education	Environmental Protection Leader Education
	Internal Environmental Auditor Education
	Overseas Environmental Conservation Promoter Education
	Key Environmental Facility Worker Education

\*1 CLP (Classification, Labelling and Packaging of substances and mixtures)  
 \*2 DERAP (Dealer Environmental Risk Audit Program)

## Joint Environmental Forums with Renta-lease Shops

In cooperation with Renta-Lease shops in different areas, Toyota carries out Environmental Forums to help Toyota customers in charge of fleet purchasing and environmental management learn more about eco-driving. From 2008 through the end of FY2010, the program has attracted a total of 585 participants through nine forums.

The contents included lectures on Toyota's Environmental Approaches Centered around Next-Generation Eco-Cars and Practical Eco-Driving and exhibition of a plug-in hybrid vehicle (PHV) and other next-generation eco-cars. Comments from participants included "The forum gave me a good understanding of the direction of next-generation eco-cars and the challenges we face in promoting their expanded use" and "It encouraged me to work internally to promote eco-driving."



Forum at a Renta-Lease outlet in Osaka

## Management

### Further Promotion of Environmental Management at Business Partners

#### Continuing Environmental Education for Partners

Toyota will continue to encourage a higher level of environmental performance among business partners including suppliers, domestic dealers and overseas distributors.

#### Main Initiatives in FY2010

<b>Suppliers</b>	To ensure compliance with regulations on chemical substances in each region of the world, Toyota held a briefing session to keep suppliers updated and seek their ongoing communication and cooperation, with a focus on the requirements in Taiwan in July 2010, and on the European CLP <sup>1</sup> in August. After these briefings, the company urges suppliers to take compliance actions, monitoring their progress and encouraging follow-up communications.
<b>Dealers in Japan</b>	Toyota began promoting environmental efforts, creating and rolling out "Toyota Dealer Environmental Guidelines" starting in 1999 and "Toyota Dealer CSR Guidelines" since 2005. These guidelines are in a self-check format that covers and divides the items dealers should follow in relation to a variety of environmental issues among headquarters and outlets so that dealers can take action on their own. Also, in January 2011, the Toyota National Dealers' Advisory Council distributed a brochure to dealers nationwide to introduce good examples of the company's past social contributions including those related to the environment in efforts to encourage a bottom-up approach.
<b>Overseas Distributors</b>	Toyota continued to implement the Dealer Environmental Risk Audit Program (DERAP) <sup>2</sup> , which audits the environmental risks of overseas dealers. To reduce risks and establish the basis for introducing an environmental management system, the audits assess dealers in terms of structures related to five fundamental requirements, including processing of hazardous waste and wastewater treatment. In FY2010, Toyota implemented the program at 2,587 dealers in 32 countries (35 distributors), resulting in an increase in the percentage of dealers meeting the five fundamental requirements from 76% to 80%. On the global level, however, a number of distributors have yet to address these issues, so it is essential to step up efforts to encourage their participation.

## Management

### Promotion of New Businesses that Contribute to Environmental Improvements

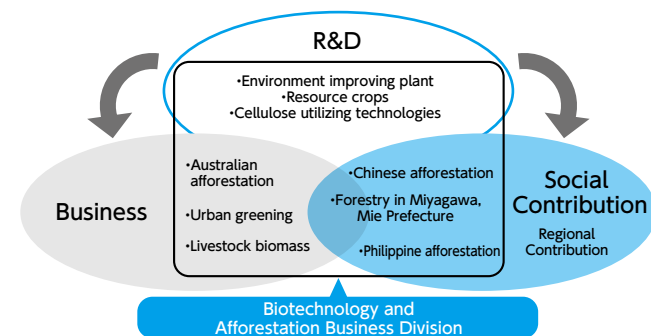
[Promotion of New Biotechnology and Afforestation Businesses]

#### New Environment Contribution Business Vigorously in Progress

Toyota's efforts in the agribusiness and biotechnology fields began in January 1998 with the establishment of the Biotechnology and Afforestation Business Office. Toyota is seizing environmental action as a good opportunity for company growth, and is working towards promoting business by aiming for the fusion of environmental preservation and economic growth.

<b>Background</b>	<ul style="list-style-type: none"> <li>Population growth centered in Asia</li> <li>Increase in per capita food consumption due to income level improvements</li> <li>Food and water shortages and the deterioration of the global environment</li> </ul>
<b>Mission</b>	<ul style="list-style-type: none"> <li>Development of new agribusiness aiming to realize a resource recycling society</li> <li>Development of environment contribution greening business through global environment improvements</li> </ul>

#### R&D, Social Contribution, Business Chart



#### Urban Greening Business

Affiliate	Business
Toyota Roof Garden Co., Ltd.	<ul style="list-style-type: none"> <li>Developed the modular grass turf tile, the TM9 Turf Mat, which uses the easy-care, slow-growing zoysia grass TM9. By FY2010, cumulative sales of TM9 had reached 1,050,000 m<sup>2</sup>, with TM9 Turf Mats making up 10,000 m<sup>2</sup> of that.</li> </ul>

#### Florist Business

Affiliate	Business
Toyota Floritech Co., Ltd.	<ul style="list-style-type: none"> <li>The venture was established in Rokkasho Village, Aomori Prefecture, jointly with a general flower trader, Hakusan Co., Ltd. Using a tri-generation system and other environmentally considerate large-scale greenhouse facilities as the operational base, it produces and distributes potted plants including miniature flowers and ornamental foliages.</li> </ul>

#### Livestock Biomass Business

Affiliate	Business
Toyota Roof Garden Co., Ltd.	<ul style="list-style-type: none"> <li>Developed a manure composting process for the livestock industry called resQ45 in cooperation with Menicon Co., Ltd. As of March 2011, approximately 60 farms, mostly large-scale ones, are using it continuously. In June of the same year, released a new deodorizer for composting swine discharge called Buta resQ.</li> </ul>

#### Overseas Afforestation Business

Affiliate	Business
Australian Afforestation Pty. Ltd.	<ul style="list-style-type: none"> <li>Working towards the afforestation of eucalyptus trees, which grow extremely fast, and by the end of FY2008, 1,763 hectares of these trees had been planted. In 2009, harvesting began, and 40,000 tons have been shipped to Japan as pulp and paper.</li> </ul>



\*1 Eco-VAS: Eco-Vehicle Assessment System  
 \*2 LCA: Life Cycle Assessment

[Other Businesses]

**Advancements in Solid Oxide Fuel Cell (SOFC) Cogeneration System for Household Use**

Joint Development Company	Business
Toyota Motor Corporation Aisin Seiki Co., Ltd. Osaka Gas Co., Ltd. Kyocera Corporation	<ul style="list-style-type: none"> <li>The demonstration phase of joint program is now under way, involving four companies with the aim of developing solid oxide fuel cell cogeneration systems for household use. The program began with 30 systems and now has 88 in operation. The household fuel cell offers a range of advantages, such as smaller transmission loss, improved heat utilization and low CO<sub>2</sub> emissions, compared to conventional power sources.</li> </ul>

**Management**

**Steady Reduction of Environmental Impact over the Entire Vehicle Lifecycle through Implementation of Eco-VAS**

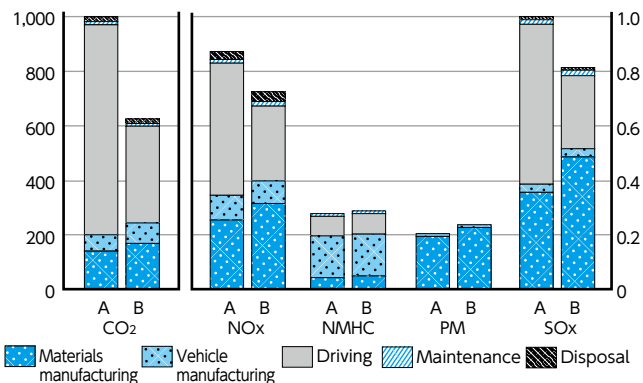
**Application of LCA to New and Fully Changed Vehicles in Four Vehicle Series**

The Eco-Vehicle Assessment System (Eco-VAS)\*1 is a comprehensive environmental impact assessment system that allows systematic assessment of a vehicle's impact on the environment over the entire lifecycle from vehicle production and use to disposal stages. Toyota uses Eco-VAS to conduct lifecycle assessment (LCA)\*2, which assesses a vehicle's total environmental impact from materials production, vehicle manufacturing, driving and maintenance to disposal stages.

In FY2010, Toyota used Eco-VAS to conduct LCA on four new and fully-changed models (Ractis, Vitz, FJ Cruiser, CT200h). The system has enabled Toyota to reduce CO<sub>2</sub> emissions over the entire lifecycle of the CT200h by about 39% compared with similar class vehicles.

**CT200h LCA Results**

A : Conventional vehicles in the same class B : CT200h



NO<sub>x</sub> : Nitrogen Oxide  
 NMHC : Non Methane Hydrocarbons  
 PM : Particulate Matter  
 SO<sub>x</sub> : Sulfur Oxide

•These results are based on 10-15 Japanese test mode, assuming a lifetime driving distance of 100,000km over 10 years

•Because Toyota uses LCA to verify the relative environmental benefits of its vehicles, it expresses the evaluation results as indexes. Since CO<sub>2</sub> emission are measured in tons while the emissions of other substances are measured in kilograms, different indexes are used.

**Management**

**Legal Compliance Activities**

**Key Advancements during FY2010**

Achieving Zero Non-compliance and Complaints
In FY2010, Toyota re-examined potential complaint areas to prevent recurrence of past near-miss incidents in an effort to achieve zero cases of non-compliance and complaints for the second consecutive year. Comprehensive on-site verification meetings were held to identify the root causes of near-miss incidents that occurred, discuss corrective actions, share conclusions among relevant plants and implement preventive plans. These verification practices will be maintained throughout FY2011 as well.
Reporting and Storing Electrical Devices Containing PCBs
Since FY2005, Toyota has been using outside subcontractors to process electrical devices containing polychlorinated biphenyl (PCB). To date, 4,124 transformers and condensers have already been processed. The remaining 1,123 units will continue to be handled on an outsourcing basis in FY2011 and beyond.
Soil and Groundwater-related Measures
In 1997, Toyota completed the implementation of measures to prevent outflow of groundwater at six production plants. Toyota has continued groundwater remediation using pump and aeration treatment and reports on the levels of trichloroethylene to the government and to local councils in the surrounding communities.

**Trichloroethylene Measurement Values**

Environmental standard: 0.03 Unit: mg/L

Plant	Levels in groundwater
Head Office	Less than 0.002-2.48
Motomachi	Less than 0.002-0.17
Kamigo	Less than 0.002-0.15
Takaoka	Less than 0.002-0.42
Miyoshi	Less than 0.002-0.16
Tsutsumi	Less than 0.002-0.47

Note 1: Measurements are taken at all plants and business sites

Note 2: Has not been detected in plants other than those listed

Note 3: The level has a range since each plant includes multiple measurement points

**Air and Water Quality Data**

Item	'06	'07	'08	'09	'10	
Air	NO <sub>x</sub>	419	416	367	391	383
	SO <sub>x</sub>	68	32	25	20	18
Water	Total nitrogen	55.1	64.0	71.6	61.6	54.1
	Total phosphorus	4.7	4.6	4.6	4.4	4.3
	COD	96.8	91.3	84.5	76.7	66.9

Note 1: The unit for air quality data is 1,000m<sup>3</sup> N/year and for water quality data tons/year

Note 2: Water quality data was previously calculated based on the number of days plants were in operation. However, beginning in FY2008, Toyota switched to a calculation method that uses the annual total discharge volume, including the volume discharged during weekend. Figures from FY2006 have been recalculated accordingly.

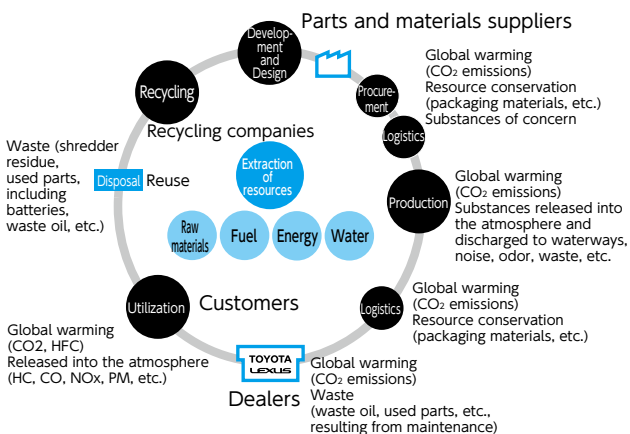
# section 6 Environmental Philosophy, Policies and the Toyota Environmental Action Plan

FY2010 was the final year of the Fourth Toyota Environmental Action Plan, and Toyota (1) achieved all objectives in the five-year plan.

In FY2011, we will begin our Fifth Toyota Environmental Action Plan, which will set the directions for the years 2020-2030. The new plan will cover three key themes: "Establishing a low-carbon society," "Establishing a recycling based society" and "Environmental protection and establishing a society in harmony with nature."

(2) In Toyota's environmental actions, not only TMC but also all subsidiaries in Japan and overseas work together to move forward on consolidated environmental management.

(3) Toyota also set the 2020 Vision, which aims at the corporate vision to be aimed by 2020. The environment is the main pillar of this vision.



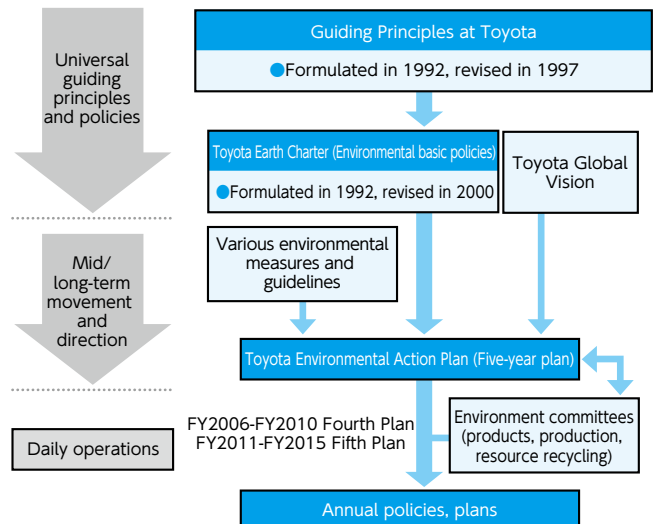
## Philosophy, Policies and the Toyota Environmental Action Plan

The Toyota Earth Charter (formulated in 1992, revised in 2000) is based on the Guiding Principles at Toyota formulated in 1992 (revised in 1997), and embodies Toyota's comprehensive approach to environmental issues. The Toyota Earth Charter has been adopted by 558 affiliates worldwide to date.

In March 2011, Toyota announced the Toyota Global Vision to share the direction to be taken by all companies. This clarifies the stance in accordance with the Toyota Earth Charter, and Toyota will carry this vision through to specific activities. The vision states "constant respect for the planet" urges, and clarifies commitment to CO<sub>2</sub> reduction in activities from production to sales, initiatives on recycling and human resource development and afforestation activities toward co-existence with nature.

Based on those philosophies and policies, we will launch about 10 hybrid models in the market by 2015, and advance development of PHVs, EVs and FCVs in parallel. Toyota also continually develops high-efficiency engines for further improvement of fuel economy.

### Toyota Environmental Action Plan System



\*1 TMC Toyota Motor Corporation  
 \*2 EMS Environmental Management System

## Promotion of Consolidated Environmental Management

As Toyota's business expands on a global scale, TMC\*1 introduced a consolidated environmental management system (consolidated EMS\*2) in FY2000 to promote environmental action in concert with consolidated subsidiaries. TMC presents its environmental policies and guidelines to all companies subject to consolidated EMS, and requests that all companies adopt and implement

five-year environmental action plans, create environmental management systems and undertake environmental activities at the highest levels in their each country or region. TMC also supports environmental management by affiliates through the sharing of best practices and exchanges of information to mutually strengthen relationships, as well as audit training, etc.

## Toyota Earth Charter

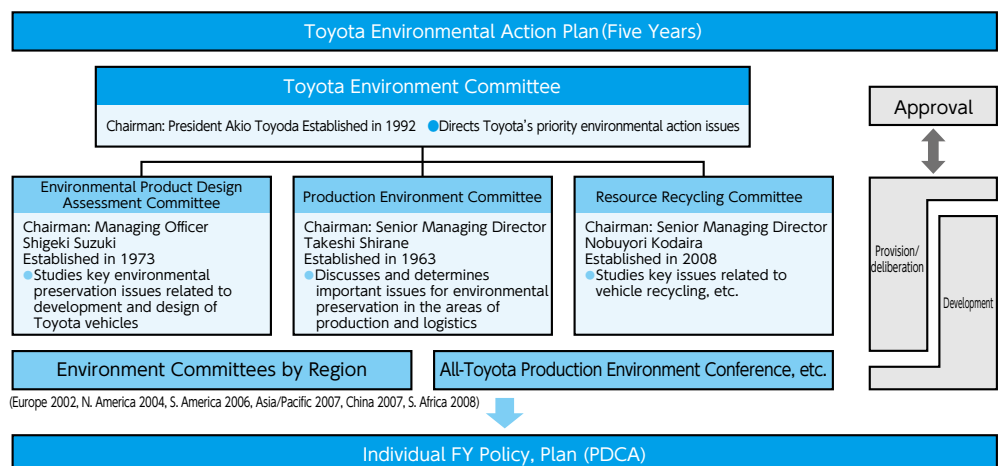
<p><b>I. Basic Policy</b></p> <p><b>1. Contribution toward a prosperous 21st century society</b>              Contribute toward a prosperous 21st century society. Aim for growth that is in harmony with the environment, and set as a challenge the achievement of zero emissions throughout all areas of business activities.</p> <p><b>2. Pursuit of environmental technologies</b>              Pursue all possible environmental technologies, developing and establishing new technologies to enable the environment and economy to coexist harmoniously.</p> <p><b>3. Voluntary actions</b>              Develop a voluntary improvement plan, based on thorough preventive measures and compliance with laws, that addresses environmental issues on the global, national, and regional scales, and promotes continuous implementation.</p> <p><b>4. Working in cooperation with society</b>              Build close and cooperative relationships with a wide spectrum of individuals and organizations involved in environmental preservation including governments, local municipalities, related companies and industries.</p> <p><b>III. Organization in Charge</b>              Promotion by the Toyota Environment Committee which consists of top management (chaired by the president)</p>	<p><b>II. Action Guidelines</b></p> <p><b>1. Always be concerned about the environment</b>              Take on the challenge of achieving zero emissions at all stages, i.e., production, utilization, and disposal              (1) Develop and provide products with top-level environmental performance              (2) Pursue production activities that do not generate waste              (3) Implement thorough preventive measures              (4) Promote businesses that contribute toward environmental improvement</p> <p><b>2. Business partners are partners in creating a better environment</b>              Cooperate with associated companies</p> <p><b>3. As a member of society</b>              Actively participate in social activities              (1) Participate in the creation of a recycling-based society              (2) Support government environmental policies              (3) Contribute also to non-profit activities</p> <p><b>4. Toward better understanding</b>              Actively disclose information and promote environmental awareness</p>
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(As of March 31, 2011)

## Implementation Structure

The "Environmental Product Design Assessment Committee," "Production Environment Committee" and the "Resource Recycling Committee" were established under the Toyota Environment Committee, which is chaired by the president, to investigate issues and develop response policies in their respective areas of responsibility. Each committee collaborates with all relevant divisions to promote company-wide action.

### Organization Framework (As of June 30, 2011)



## The Fourth Toyota Environmental Action Plan

The Fourth Toyota Environmental Action Plan outlined actions to be executed between FY2006 and FY2010 in the effort to create a company that leads environmental restoration activities with earth-friendly technologies, the ideal corporate form that Toyota should pursue. In developing the plan, the company reaffirmed key environmental issues anticipated from 2020 to 2030, identifying four major themes to be addressed: (1) energy/global warming, (2) recycling of resources, (3) substances of concern and (4) atmospheric quality. In response to these themes, Toyota has drawn up action items, specific implementation plans and objectives in each field of its business operations—namely, development/design, procurement, production/logistics, sales and recycling—to further promote and strengthen its environmental management.

## Results of the Fourth Toyota Environmental Action Plan (Objectives were achieved in every field)

Toyota successfully implemented all 22 actions and achieved nearly all objectives as planned. See below for achievements in each field.

### (1) Energy/Global Warming

Cumulative sales volume of HVs has exceeded the 3.1 million mark (as of the end of March 2011) through efforts to improve HV system performance and expand the HV model lineup. Also, plug-in hybrid models went on the market in Japan, the United States and Europe. Conventional models not only comply with regulations in each country but also offer best-in-class fuel economy in those three regions and China. In the production field, Toyota achieved its CO<sub>2</sub> reduction goal for FY2010 earlier than expected, thanks to the expansion of

	Action Items	Specific Actions and Goals
Energy/ Global Warming	① Reduce CO <sub>2</sub> emissions in Toyota's global operations	<ul style="list-style-type: none"> <li>• Adopt and steadily implement medium- and long-term scenarios for CO<sub>2</sub> emissions reduction</li> </ul>
	② Promote the development of technologies to achieve the best fuel efficiency performance in each country and region	<ul style="list-style-type: none"> <li>• Japan: Steadily promote improvements in fuel efficiency to surpass the 2010 Fuel Efficiency Standards</li> <li>• Europe: Steadily implement initiatives to realize the Japan Automobile Manufacturers Association's commitment to reduce CO<sub>2</sub> emissions to 140g/km by 2009</li> <li>• North America: Steadily promote the development of technologies aiming to achieve the best fuel efficiency among competing vehicles of the same class</li> <li>• China: Achieve the new fuel efficiency standards in the short-term and realize leading fuel efficiency levels by vehicle class</li> </ul>
	③ Promote the development of clean-energy vehicles, encourage their effective introduction and ensure wider market acceptance	<ul style="list-style-type: none"> <li>• Further improve the performance of hybrid systems, increase the number of hybrid vehicle series and introduce them in more markets</li> <li>• Develop and quickly introduce next-generation fuel cell vehicles in light of the diversification of energy sources</li> </ul>
	④ Develop technologies to respond to the diversification of energy and fuel sources	<ul style="list-style-type: none"> <li>• Assess and develop corresponding technologies for various types of bio fuels and synthetic fuels that will contribute to reductions in CO<sub>2</sub> emissions and energy security</li> </ul>
	⑤ Promote initiatives to improve traffic flow using a variety of networking technologies	<ul style="list-style-type: none"> <li>• Promote initiatives to improve traffic flow in cooperation with relevant organizations, aiming to introduce to society traffic systems that use ITS from the three-fold perspective of "cars," "traffic infrastructure" and "people"</li> </ul>
	⑥ Reduce CO <sub>2</sub> emissions in the production and logistics activities of each country and region	<p>&lt;Production&gt;</p> <ul style="list-style-type: none"> <li>• Dramatically increase productivity through measures such as the development of innovative production technologies, thus reducing CO<sub>2</sub> emissions</li> <li>• Develop technologies that will enable the use of "new energy" and study their introduction</li> </ul> <p>&lt;Logistics&gt;</p> <ul style="list-style-type: none"> <li>• Promote CO<sub>2</sub> emissions reduction activities through improvements in transportation efficiency</li> </ul>
Recycling of Resources	⑦ Promote the effective use of resources to further contribute to the realization of a recycling-based society	<p>&lt;Production&gt;</p> <ul style="list-style-type: none"> <li>• Reduce the volume of materials discarded by taking action at the source, such as improving yields and other measures (reduce the volume of valuable materials such as scrap metal and waste and maintain zero landfill waste generation)</li> </ul> <p>&lt;Logistics&gt;</p> <ul style="list-style-type: none"> <li>• Reduce packaging and wrapping material usage by keeping packaging to a minimum and increasing the use of returnable containers</li> </ul>
	⑧ Reduce water consumption	<ul style="list-style-type: none"> <li>• Set separate goals for each country and region and continue implementing measures to reduce water consumption</li> </ul>
	⑨ Steadily implement recycling systems in Japan and Europe	<ul style="list-style-type: none"> <li>• Steadily implement measures to achieve a vehicle recycling/recovery rate of 95% in 2015</li> <li>• Develop recycling technologies for newly developed parts (FC and HV parts, etc.) and create collection networks</li> </ul>
	⑩ Further promote and expand the use of designs based on the design for recycling (DFR) concept	<ul style="list-style-type: none"> <li>• Promote and expand the development of vehicles that are easy to dismantle and recycle</li> </ul>

energy-saving initiatives on a global scale, innovative production technologies and improved productivity.

## (2) Recycling of Resources

Toyota has made continued progress in reducing the volume of materials discharged per sales unit in the production field and the volume of packaging materials in the logistics field, and achieved its FY2010 goals in these areas. Toyota also joined the world's first battery-to-battery recycling business in October 2010 and thus accomplished all of its resource recycling goals in the automotive manufacturing field.

## (3) Substances of Concern

Efforts to manage and reducing the use of substances of concern in product design and production moved ahead as planned, and Toyota steadily implemented its responses to the REACH standards and other new regulations.

## (4) Atmospheric Quality

The development of ultra-low emission technology has ensured that nearly 100% of Toyota vehicles meet or exceed U-LEV standards. Painting facilities also significantly exceeded their goal of reducing VOC emissions, primarily by converting waterborne paint.

## (5) Consolidated Environmental Management

In six regions around the world excluding Japan, Toyota has conducted regional environment task force activities and worked closely with local business partners, including distributors, dealers and suppliers, to reduce the environmental impact of the company's activities. Toyota moved ahead to reduce the environmental impact. Toyota built deeper ties with local communities by enhancing social contributions and environmental protection and disclosure of environmental information.

### Status of Action

- Formulated the road maps for CO<sub>2</sub> emissions reduction activities (vehicles and plants). Reflected this in the development plan (vehicles, production technology)

- Achieved top-class fuel efficiency in Japan, North America and Europe
  - Japan: Fuel efficiency standards met in all categories. Exceeded industry averages in all categories
  - Europe: Introduced Low-CO<sub>2</sub> emissions vehicles and reached goal achievement level
  - The U.S.: Average fuel efficiency for passenger vehicles maintained at the highest levels
  - China: Compliance with phase 2 fuel efficiency regulations (effective as of 2008) completed and top level fuel efficiency retained

- Total vehicle sales reached 3.1 million. Introduced 19 models (March 2011). Began to sell a new PHV in Japan, the U.S. and Europe (December 2009)
- The Toyota FCHV-adv, an improved fuel cell vehicle, was developed and leasing began in September 2008

- Compatibility with E10 fuel achieved for all vehicles sold worldwide. Introduced Flexible Fuel Vehicles (FFVs) in Brazil (2007)
- Continued development of technologies for the production of bio fuels that do not compete with foodstuffs

- Began Probe communication traffic information service (best routes to avoid traffic congestion) (The G-BOOK mX telematic service began in April 2007)
- Continued development of systems that work in collaboration with infrastructure to improve traffic flow, such as a system that uses traffic signal information to prevent delayed startup at traffic signals. The system was adopted on new models launched in summer 2011
- Cooperated with Toyota City on its development as a low-carbon society ("Eco-Model City" concept), based on the "Hybrid City" basic concept
- Carried out initiatives to verify the operation of new types of mobility (e.g., plug-in hybrids and fuel cell buses) and to reduce traffic congestion by introducing an employee parking zone system to improve their commute and by cooperating with the city's major bus lines and commuter shuttle buses

	Region	Item	FY2010 goal	FY2010 results
Production	Worldwide	Emissions volume/sales unit	20% reduction from FY2001	23% reduction from FY2001
		TMC	Emissions volume/sales unit	35% reduction from FY1990
		Emissions volume	20% reduction from FY1990	45% reduction from FY1990
Logistics	Japan	Emissions volume	10% reduction from FY1990	40% reduction from FY1990
	Overseas	Grasp actual figures by FY2007 and make a shift to management by objectives		Shift almost completed

	Region	Item	FY2010 goal	FY2010 results
Production	Japan	Volume of materials discarded/sales unit	3% reduction from FY2003	28% reduction from FY2003
	TMC	Volume of materials discarded/sales unit	20% reduction from FY2000	46% reduction from FY2000
	Overseas	Waste (promote reduction activities that are at the highest level in each country)		Promoted at regional committee
Logistics	Japan	Usage volume of packaging material	43% reduction from FY1995	45% reduction from FY1995
	Overseas	Grasp usage volumes and expand reduction activities		Now systematically promoting expansion

- Each company implemented voluntary reduction activities (global per-unit consumption m<sup>3</sup>/vehicle: 4.8 in FY2001 and 3.7 in FY2010)

- (Japan) Vehicle recycling/recovery rate target for FY2015 achieved since FY2007. Also, steadily increased recycling rate by developing new recycling facilities (Europe) Built end-of-life vehicle collection networks in 23 of the 27 EU countries. Supporting the remaining 4 countries along with the authorization of dismantling companies by those countries' governments.

FY	2006	2007	2008	2009	2010
Rate	94%	96%	97%	97%	97%

- Organized the new Resource Recycling Committee to promote car-to-car recycling programs in view of the fact that the risk surrounding resources due to concentrations of resources in certain countries and reserve-production ratios. (Recycling technologies)
  - ① Batteries (Nickel batteries) - Developed technology for practical application to extract nickel alloys, a raw material for batteries, from end-of-life batteries. Completed basic study of technology for turning rare earth into raw material for batteries is already developed.
  - (Lithium batteries) - Completed development of basic technology for optimal processing (patents pending in Japan, USA, and China)
  - ② HV magnets: Completed basic study of technology to remove the magnets and recycle them into usable resources completed
  - ③ Copper: Completed basic study of technology in hand to remove copper from HV motors and looking at recovery of high-grade copper from wiring harnesses
- (Establishment of collection networks)
  - ① Japan (Nickel batteries) - October 2009: Realized collection system at affordable prices using venous physical distribution and Toyota Recycle Corporation. Started its commercialization
  - October 2010: (World first) Started up battery-to-battery recycling business. (Sumitomo Metal Mining Co., Ltd., Primearth EV Energy Co., Ltd., Toyota Chemical Engineering Co., Ltd.) (Lithium batteries) - Started collection of batteries using the nickel battery recovery route after the launch of Prius α
  - ② EU, USA, China: Set up HV Collection Centers in 2010 and started recovery

- Improve dismantlability by developing dismantling simulation programs and continuing easily dismantling engineering for new models
  - ① Create simulation systems that show dismantling of instrument panels and wiring harnesses, and a way to evaluate at the design stage how easily components can be stripped from the panel, something that has been difficult in the past. (2007: instrument panel, 2008: wiring harness)
  - ② Change in shape of bolt holding spare tire in place so it can be removed with electric tools instead of having to be removed by hand as in the past. (2006: Used on LS460 models)
  - ③ Change of component composition, fewer components, reduced HV battery dismantling time by some 12%. (2009: Prius)

\*1 Eco-plastic: A type of plastic developed by Toyota for use in automobiles that contains plant-derived materials, featuring improved heat resistance and shock resistance as compared to general bio-plastics

Action Items	Specific Actions and Goals
Recycling of Resources	<p>10 Further promote and expand the use of designs based on the design for recycling (DfR) concept</p> <ul style="list-style-type: none"> <li>•** Expand the usage of renewable resources such as Eco-plastic*, and recycled materials (establish technologies that enable use of 15% resin parts by FY2010)</li> <li>•Develop and increase use of designs based on the DfR concept for newly developed parts</li> </ul>
Substances of Concern	<p>11 Promote management and further reductions in the use of substances of concern (SOCs)</p> <ul style="list-style-type: none"> <li>•Eliminate use of four SOCs (lead, mercury, cadmium and hexavalent chromium) globally</li> </ul> <p>12 Reduce the discharge of substances subject to the PRTR Law</p> <ul style="list-style-type: none"> <li>•Introduce vehicles in Japan and Europe that use zero amounts of the four banned substances starting in FY2006; complete elimination, with some exemptions, by 2007</li> <li>•Eliminate worldwide usage of the four banned substances in accordance with Toyota's global standards in the short term</li> <li>•Reduce cabin VOC levels in all new vehicles launched globally by 2010</li> <li>•Develop air conditioners that use coolants with a small global warming potential</li> <li>•Reduce the discharge of substances subject to the PRTR Law, focusing on vehicle painting processes</li> </ul>
Atmospheric Quality	<p>13 Reduce emissions to improve air quality in urban areas in all countries and regions</p> <ul style="list-style-type: none"> <li>•Promote the development of ultra-low emissions technologies and introduce the best-performing low-emissions vehicles according to conditions in each country</li> <li>•Continue development of high-efficiency clean diesel vehicles</li> </ul> <p>14 Implement initiatives to reduce VOC emissions</p> <ul style="list-style-type: none"> <li>•Implement measures to further reduce the volume of cleaning solvents used in vehicle painting processes and expand the use of waterborne paints</li> </ul>
Environmental Management	<p>15 Strengthen consolidated environmental management</p> <ul style="list-style-type: none"> <li>•(Production affiliates)</li> <li>•Implement global Eco-Factory activities that ensure the incorporation of environmental measures from the planning stages</li> <li>•Zero instances of non-compliance and complaints, minimizing environmental risks, and achieving leading levels of environmental performance in each country and region)</li> <li>•(Non-production affiliates)</li> <li>•Manage and enhance affiliates' environmental performance (CO2 emissions, etc.) on a global scale</li> </ul> <p>16 Further promote environmental management to business partners</p> <ul style="list-style-type: none"> <li>•(Suppliers)</li> <li>•Management of SOCs contained in parts, raw materials, production facilities and other items supplied to Toyota</li> <li>•Request voluntary initiatives by suppliers to improve environmental performance</li> <li>•(Japanese dealers)</li> <li>•In addition to proper disposal of waste and treatment of wastewater, undertake active steps to address a broad range of issues such as reducing CO2 emissions</li> <li>•Support dealer initiatives to reinforce and enhance their environmental management functions</li> <li>•(Non-production affiliates)</li> <li>•Create support and monitoring systems to assess, manage and reduce CO2 and other emissions of overseas distributors</li> <li>•Support initiatives to ensure appropriate disposal of waste, wastewater and air conditioner coolants at overseas dealers</li> </ul> <p>17 Enhance environmental education</p> <ul style="list-style-type: none"> <li>•In addition to raising employee environmental awareness, continue conducting environmental training that contributes to improvement in actual work activities</li> <li>•Enhance global environmental education and include consolidated affiliates</li> </ul> <p>18 Promote new businesses that contribute to environmental improvement</p> <ul style="list-style-type: none"> <li>•Expand existing new biotechnology and afforestation businesses and establish new ones</li> <li>•Promote development and launch of stationary fuel cells</li> <li>•Expand businesses that reduce environmental risk, such as management of SOCs, etc.</li> </ul> <p>19 Steadily reduce environmental impact over the entire lifecycle of the product through full-scale implementation and establishment of Eco-Vehicle Assessment System (Eco-VAS)</p> <ul style="list-style-type: none"> <li>•Implement on new and fully changed models in Japan and expand to all vehicles, including those produced in Europe and America</li> </ul> <p>20 Contribute to the development of a recycling-based society</p> <ul style="list-style-type: none"> <li>•Promote basic environmental research, such as development of technology to reduce CO2 emissions, and make proposals</li> <li>•Implement philanthropic programs that contribute to development of environmental technologies, environmental education, and the preservation of biodiversity</li> <li>— Continue implementing and further enhance the content of activities such as the Toyota Environmental Activities Grant Program (in commemoration of winning the Global 500 Award) and the establishment of the TOYOTA Shirakawa-Go Eco-Institute</li> </ul> <p>21 Increase disclosure of environmental information and two-way communication</p> <ul style="list-style-type: none"> <li>•Increase the provision of information on environmental technologies</li> <li>•Provide eco-drive information to consumers</li> <li>•Enhance the environmental reports of each country and region</li> <li>•Improve communication with each region</li> <li>•Engage in dialogue and enhance mutual understanding with a wide range of stakeholders</li> </ul> <p>22 Actively contribute to and propose environmental initiatives based on sustainable development</p> <ul style="list-style-type: none"> <li>•Participate in debates concerning the creation of governmental environmental policies and frameworks both in Japan and overseas</li> <li>•Promote environmental measures proposed by the World Business Council for Sustainable Development (WBCSD), Nippon Keidanren and JAMA</li> </ul>

## TMC Environment-related Accidents

During FY2010, Toyota organized *genchi genbutsu* (on-site verification) review sessions in an unrelenting effort to find the root causes of complaints and prevent the reoccurrence of past near-miss environmental incidents. Toyota achieved no environment-related accidents or complaints in FY2010, marking the second consecutive year with a perfect record. Toyota is making every effort to maintain its zero-accident performance in FY2011.

- \*2 Excluding companies that have a minor environmental impact, such as tenant type,
- \*3 EPI (Environmental Performance Indicators)
- \*4 DERAP (Dealer Environmental Risk Audit Program)
- \*5 SOFC (Solid Oxide Fuel Cell)
- \*6 Hokkaido Gas Co., Ltd., Tokyo Gas Co., Ltd., Toho Gas Co., Ltd., Osaka Gas, Ltd., Seibu Gas Co., Ltd.
- \*7 NEDO (New Energy and Industrial Technology Development Organization)

Results																						
<ul style="list-style-type: none"> <li>• 15% usage target for plastic components made of Toyota Eco-plastic and other easily recycled plastics or recycled materials achieved (New Project)                             <ul style="list-style-type: none"> <li>① Develop Eco-plastic that can be used as seat pads or other automotive interior components                                     <ul style="list-style-type: none"> <li>• Eco-plastic used for 60% of interior components by area (2009 SAI)</li> <li>• BioPET used for upholstery (2010 CT200h, world first)</li> </ul> </li> <li>② Used material recycled from end-of-life automobile bumpers                                     <ul style="list-style-type: none"> <li>• Used for deflectors (2010 Alphard, Vellfire)</li> </ul> </li> <li>(Continuing usage) ③ Material recycled from damaged and replaced bumpers recovered from dealers has been used to make engine undercovers, etc., since 1991 (about 4.5 million bumpers recovered 2006 - 2010)</li> <li>④ RSP (Recycled Sound-Proofing Products) made from ASR (Automotive Shredder Residue) used in some 20 million vehicles since 1998</li> </ul> </li> <li>• Promote development of removal, disposal and recycling systems for batteries (lithium-ion) used in plug-in hybrids and electric vehicles, which are expected to gain significant market penetration, as well as for newly developed components for fuel-cell hybrids (fuel stacks, high-pressure hydrogen fuel tanks, etc.)</li> </ul>																						
<ul style="list-style-type: none"> <li>• Essentially eliminated the use of the 4 banned substances globally by the end of 2007</li> <li>• EU REACH regulations: Responded to the first registration deadline (November 2010) and EU CLP Regulation. Started actions on removing and replacing substances of concern</li> <li>• Efforts under way to achieve goals for new vehicles and to achieve voluntary industry standards for fully changed vehicles launched in Japan</li> <li>• Developing air conditioners that use new coolants with a lower global warming coefficient</li> </ul>																						
<ul style="list-style-type: none"> <li>• Converted waterborne body paints and improve ratio of recycling cleaning solvent</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Region</th> <th style="text-align: center;">Item</th> <th style="text-align: center;">FY2010 Goal</th> <th style="text-align: center;">FY2010 Results</th> </tr> </thead> <tbody> <tr> <td rowspan="3" style="text-align: center; vertical-align: middle;">Production</td> <td style="text-align: center;">Japan</td> <td style="text-align: center;">Emission volume</td> <td style="text-align: center;">55% reduction from FY1998</td> <td style="text-align: center;">75% reduction from FY1998</td> </tr> <tr> <td style="text-align: center;">TMC</td> <td style="text-align: center;">Emission volume</td> <td style="text-align: center;">70% reduction from FY1998</td> <td style="text-align: center;">82% reduction from FY1998</td> </tr> <tr> <td style="text-align: center;">Overseas</td> <td colspan="2" style="text-align: center;">Set goals that are stricter than each country's regulations and implement reduction activities</td> <td style="text-align: center;">Being implemented</td> </tr> </tbody> </table>						Region	Item	FY2010 Goal	FY2010 Results	Production	Japan	Emission volume	55% reduction from FY1998	75% reduction from FY1998	TMC	Emission volume	70% reduction from FY1998	82% reduction from FY1998	Overseas	Set goals that are stricter than each country's regulations and implement reduction activities		Being implemented
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<ul style="list-style-type: none"> <li>• Achieved or surpassed ultra-low emission vehicle (U-LEV) levels for 100% of vehicles produced (Japan) (Overseas: being adapted under each country's regulations)</li> <li>• Continued development of high-efficiency clean diesel vehicles and introduced mainly in Europe</li> </ul>																						
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<ul style="list-style-type: none"> <li>• Globally rolling out eco-factory activities with plants newly built, remodeled or expanded since 2006 (total 23 plants)</li> <li>• Current actions aim to place Toyota at No.1 in environmental performance worldwide (CO<sub>2</sub>, substances that have an impact on the environment, water usage, reduced industrial waste), ZERO legal complaints and minimization of environmental risks</li> <li>• Completed directly managed company*2 CO<sub>2</sub> condition monitoring system preparations (EPI*2 implemented, and monitoring is being carried out)</li> <li>• Established regional environmental committees in 6 global regions</li> </ul>																						
<ul style="list-style-type: none"> <li>• Issued new and revised "Green Purchasing Guidelines" by May 2008 (for 8 companies in Japan and 23 companies overseas)</li> <li>• Promoted environmental impact substance management fulfillment and voluntary environmental performance improvements</li> <li>• Completed building a reporting system within the EPI of the environmental performance results for CO<sub>2</sub>, etc. of the major consolidated dealers etc.</li> <li>• Completed Energy Service Company (ESCO) (2008 year-end at 15 directly-managed dealers in Tokyo)</li> <li>• Performing outlet stores of energy saving methods on the outlet store design navigation (using intranet) (from February 2010)</li> <li>• Implemented EPI for major consolidated overseas distributors, and are currently monitoring the program</li> <li>• 80% of dealers met the requirements for DERAP**4 at the overseas major distributors (4% increase from FY2009)</li> </ul>																						
<ul style="list-style-type: none"> <li>• Carried out hierarchical environmental education (new employees, new group managers, etc.) Implemented Coolbiz and Warmbiz activities</li> <li>• Implemented Toyota Global Environment Month activities worldwide (including a message from the president, posters, reduced lighting campaigns, etc.)</li> </ul>																						
<ul style="list-style-type: none"> <li>• Developed plants to enhance urban settings (greening of parking lots, inside greenery, etc.)</li> <li>• Developed anti-odor materials to greatly reduce odors at pig-breeding farms</li> <li>• Continued appropriate tree cultivation management and logging for the Australian tree planting business, contributing to environmental improvement (preventing damage from salt etc.)</li> <li>• Began development of Solid Oxide Fuel Cell (SOFC) cogeneration system (starting in March 2009), in cooperation with Osaka Gas, Kyocera, Aisin Seiki, and Toyota. Participated in the empirical research (provided 88 units of stationary fuel cells to five local gas utilities*6) implemented by NEDO**7 in FY2009, FY2010</li> <li>• Promoted chemical substance management through the use of the PRTR calculation system of the subsidiary Eco Research</li> </ul>																						
<ul style="list-style-type: none"> <li>• Completed Eco-VAS deployment to all vehicles. Steadily reduced emissions on each model by visualizing lifecycle CO<sub>2</sub></li> </ul>																						
<ul style="list-style-type: none"> <li>• Supported the basic research activities of the Global Climate and Energy Project (GCEP) via Stanford University</li> <li>• Biodiversity: Formulated and announced the Toyota Biodiversity Guidelines (March 2008)</li> <li>• Produced and distributed Toyota's Approach to Biodiversity brochure (October 2010)</li> <li>• Toyota Environmental Activities Grant Program: Provided support to 105 projects in Japan and overseas over five years from FY2006 to FY2010. Since FY2008, the focus has been on biodiversity and global warming issues.</li> <li>• Toyota Shirakawa-Go Eco-Institute: Steadily expanded hands-on environmental education programs (13,126 people stayed at the institute and 11,854 people participated in environmental programs in FY2010)</li> </ul>																						
<ul style="list-style-type: none"> <li>• Provided environmental information on products and technologies through brochures, the internet and the Green Purchasing Network (GPN)</li> <li>• Launched a Web site with videos that explain eco-driving with e-learning incorporated, in addition to an eco-driving brochure</li> <li>• Published environmental report/sustainability report in 15 countries and regions</li> <li>• Provided support and assistance in Toyota City's application for selection as an Eco Model City (transportation, industry, forests), and city-sponsored events</li> <li>• Topics are selected and Stakeholder Dialogues are held every year</li> </ul>																						
<ul style="list-style-type: none"> <li>• Formed cooperative ties with the automobile manufacturers associations of Japan, the U.S. and Europe, and held side events at COP15 (2009) and COP16 (2010) to globally publicize comprehensive measures</li> <li>• Incorporated Toyota's stance, such as integrated measures, into WBCSD "Towards a Low-carbon Economy (July 2009)," "the Mobility for Development project (May 2009)," "Vision 2050 (February 2010)" and "Carbon Price (March 2011)</li> </ul>																						

## TMC Environment-related Recalls

Toyota experienced no environment-related recalls in FY2010.

## The Fifth Toyota Environmental Action Plan (FY2011- FY2015)

— Goals of Activities: ‘Contributing to growth of sustainable society and Earth’ —

through *monozukuri*, coexisting with the global environment, making cars and offering quality products and services

The Fifth Toyota Environmental Action Plan sets the future direction of Toyota’s environmental activities, outlines the company’s ideal form and defines the action plan and goals for the five-year period starting in FY2011.

In developing the new plan, Toyota streamlined actions from two points of view: environmental risks and business opportunities (such as penetration of eco-cars) in corporate operations and environmental initiatives expected of a company toward the decade 2020 between 2030. The company positioned these issues under the three major themes: (1) establishing a low-carbon society, (2) establishing a recycling-based society and (3) environmental protection and establishing a society in harmony with nature. Embracing these themes, Toyota will contribute to the sustainable development of society and the world through *monozukuri* (manufacturing), *kurumazukuri* (car-making), products and services in harmony with the global environment.

		Action Items	Specific Actions and Goals																		
Contribution to a Low Carbon Society	Development and Design	① Develop next-generation vehicles that use electricity for propulsion, and ensure wider market acceptance of the vehicles based on their characteristics	<ul style="list-style-type: none"> <li>•HV: Aim to achieve annual sales volume of 1 million units and total accumulated sales volume of 5 million units in the early 2010s. Further develop HV technologies and stimulate the HV market by introducing new models and expand field</li> <li>•PHV: Promote as HV with EV drive for daily use; launch in 2012 and aim for annual sales in the tens of thousands</li> <li>•EV: Promote as vehicle for short-distance use; launch in 2012</li> <li>•FC: Develop a next generation FC vehicle and market it for mid-long distance use</li> </ul>																		
		② Develop technologies to achieve the best fuel-efficiency performance and conform to the laws and regulations in each country and region	<ul style="list-style-type: none"> <li>•By 2015, improve average fuel efficiency in all regions by 25% compared to that of 2005 (Passenger vehicles in Japan, U.S., Europe and China are included. In the U.S., LDT is also included.)</li> <li>•Meet the fuel-efficiency standards in each country and region                             <ul style="list-style-type: none"> <li>- Japan: Steadily meet the FY2015 fuel efficiency standard</li> <li>- U.S.: Meet new CAFE standards in passenger vehicle and LDT categories</li> <li>- Europe: Promote initiatives and meet next standards and long-term goal</li> <li>- China: Meet the new fuel-efficiency standard</li> <li>- Other regions: Steadily introduce technologies to improve fuel efficiency</li> </ul> </li> </ul>																		
	Production and Logistics	③ Thoroughly conduct activities aimed at saving energy and reducing the volume of GHG emissions in production activities	<ul style="list-style-type: none"> <li>•Promote activities to reduce CO<sub>2</sub> emissions through development and introduction of innovative low CO<sub>2</sub>-emitting production technologies, and daily improvement activities (Pursue productivity improvement, promotion of improvement activities, including at offices)</li> <li>•Utilize renewable energies considering characteristics of each country and or region</li> <li>•Management of GHG emissions from sources other than energy sources</li> </ul>																		
		④ Pursue transport efficiency and reduce the volume of CO <sub>2</sub> emissions in logistics activities	<ul style="list-style-type: none"> <li>•Promote CO<sub>2</sub> reduction activities by further improving transport efficiency</li> </ul> <table border="1"> <thead> <tr> <th>Region</th> <th>Item</th> <th>Base year</th> <th>Target (FY2012)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Global</td> <td>Emissions per unit produced</td> <td>FY2001</td> <td>29% reduction</td> </tr> <tr> <td rowspan="2">TMC</td> <td>Emissions per unit produced</td> <td>FY2001</td> <td>37% reduction</td> </tr> <tr> <td>Total emissions volume</td> <td>FY1990</td> <td>25% reduction*</td> </tr> <tr> <td>Overseas</td> <td colspan="3">Promote reduction activities that are the highest level in each country</td> </tr> </tbody> </table> <p style="text-align: right;">*Average value from FY2008 to FY2012</p>	Region	Item	Base year	Target (FY2012)	Global	Emissions per unit produced	FY2001	29% reduction	TMC	Emissions per unit produced	FY2001	37% reduction	Total emissions volume	FY1990	25% reduction*	Overseas	Promote reduction activities that are the highest level in each country	
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Sales	⑤ Thoroughly conduct activities to save energy and reduce the volume of CO <sub>2</sub> emissions in sales activities	<ul style="list-style-type: none"> <li>•Conform to the Energy Saving Act and reduce per-unit energy at the annual rate of 1% or more, in line with the plan</li> </ul>																			
Working Together with Society	⑥ Actively contribute to and propose climate change initiatives	<ul style="list-style-type: none"> <li>•Promote environmental measures to contribute to the low carbon society proposed by Nippon Keidanren, JAMA, WBCSD, and industry organizations</li> <li>•Participate in debates, both in Japan and overseas, concerning governmental environmental policies and frameworks</li> </ul>																			
	⑦ Promote integrated approach to reduce CO <sub>2</sub> emissions in the road transport sector	<ul style="list-style-type: none"> <li>•Promote integrated approach with JAMA and other groups</li> <li>•Implement initiatives to contribute to traffic-flow improvement using IT &amp; ITS technologies</li> <li>•Implement initiatives to promote eco-driving</li> </ul>																			
Contribution to a Recycling-based Society	Development and Design	⑧ Further promote the use of designs based on the recycling concept with effective utilization of resources borne in mind	<ul style="list-style-type: none"> <li>•Further enhance ease of parts removal to effectively utilize resources, implement new initiatives to improve separation and the sorting of materials</li> <li>•Establish a technology that enables 20% usage of Ecological Plastic and recycled resin materials in resin parts by 2015, promote use of recycled materials at the highest level in the industry</li> </ul>																		



\*1 Waste : Waste at cost, incineration of waste, landfill waste  
 \*2 Definition of zero landfill waste : A reduction in direct landfill waste to less than 1% of the FY1995 level  
 \*FY2015 target of production and logistics areas will be established by FY2012

Action Items		Specific Actions and Goals																															
Contribution to a Recycling-based Society	Production and Logistics	<p>9 Reduce the volume of discarded materials and use resources effectively in production and logistics</p> <p>Reduce the volume of materials discarded by taking action at the source, such as improving yields and other measures, and promote effective use of resources</p> <ul style="list-style-type: none"> <li>Promote activities to reduce total resource loss such as the reduction of the volume of reclaimed valuable materials and waste</li> <li>Promote efficient use of resources in all Toyota subsidiaries and affiliates</li> </ul> <table border="1"> <thead> <tr> <th>Region</th> <th>Target</th> <th>Target (FY2012)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Japan</td> <td>Materials discarded</td> <td>Japan</td> <td>Promote activities to reduce the volume of scrap metal, etc., and efficient use of resources in all Toyota</td> </tr> <tr> <td rowspan="2">Waste*1</td> <td>Japan</td> <td>Volume per vehicle Cut by 31% from 2001 level</td> </tr> <tr> <td>TMC</td> <td>Volume per vehicle Cut by 45% from 2001 level</td> <td></td> </tr> <tr> <td colspan="3">Zero landfill waste*2</td> </tr> <tr> <td>Overseas</td> <td>Waste*1</td> <td>Promote reduction activities that are the highest level in each country</td> </tr> </tbody> </table> <p>*Logistics: Simplify and reduce packaging and wrapping materials, increase use of returnable containers</p> <p>Packaging and wrapping materials</p> <table border="1"> <thead> <tr> <th>Region</th> <th>Item</th> <th>Base year</th> <th>Target (FY2012)</th> </tr> </thead> <tbody> <tr> <td>Japan</td> <td>Volume per packaging unit</td> <td>FY2006</td> <td>6% reduction</td> </tr> <tr> <td>Overseas</td> <td colspan="3">Promote reduction activities that are the highest level in each country</td> </tr> </tbody> </table> <p>*Water consumption: Set goals according to the water environment in respective countries and regions and continue implementing measures to reduce water consumption</p>	Region	Target	Target (FY2012)	Japan	Materials discarded	Japan	Promote activities to reduce the volume of scrap metal, etc., and efficient use of resources in all Toyota	Waste*1	Japan	Volume per vehicle Cut by 31% from 2001 level	TMC	Volume per vehicle Cut by 45% from 2001 level		Zero landfill waste*2			Overseas	Waste*1	Promote reduction activities that are the highest level in each country	Region	Item	Base year	Target (FY2012)	Japan	Volume per packaging unit	FY2006	6% reduction	Overseas	Promote reduction activities that are the highest level in each country		
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Sales and Recycling	<p>10 Promote effective use of resources on a global basis</p> <p>11 Conform to the laws and regulations concerning vehicle recycling in all countries and regions</p>	<ul style="list-style-type: none"> <li>Promote the development of recycling technologies to effectively use resources</li> <li>Develop methods and tools for effective dismantling and disseminate information worldwide</li> <li>Promote activities to develop and establish a system for collecting and recycling resources on a global scale</li> </ul> <p>Japan: Maintain the highest level of recycling rate and establish technologies to achieve higher recycling rates</p> <p>Europe: Achieve early by formulating a scenario to achieve a vehicle recycling/recovery rate target of 95% by 2015 and an implementation plan by country and region</p> <p>China, emerging countries: Continue conforming to laws and regulations concerning vehicle recycling in close collaboration with regional holding companies according to the circumstances in each country and region</p>																															
Working Together with Society	12 Promote new activities and businesses including biological technology that contribute to a recycling based society	<ul style="list-style-type: none"> <li>Promote biological and afforestation businesses</li> <li>Promote technological development towards environmental improvement and the creation of a recycling based society</li> <li>Share the company's sustainable Environmental Afforestation Model worldwide to conserve and revive forests</li> </ul>																															
Environmental protection and contribution to a Harmony with Nature Society	Development and Design	<p>13 Reduce emissions to improve air quality in urban areas in each country and region</p> <p>14 Strengthen the management of chemical substances in products</p>	<ul style="list-style-type: none"> <li>Introduce low-emission vehicles that contribute to the improvement of air quality in urban areas in each country and region</li> <li>-Japan: Continuously introduce vehicles that achieve or surpass U-LEV levels (3☆4☆)</li> <li>- U.S.: Take initiatives to conform to new regulations (LEVIII, SFTPII)</li> <li>- Europe: Appropriately conform to EURO5, take initiatives to quickly conform to new regulations EURO6</li> <li>- China: Promote introduction of countrywide regulations equivalent to EURO5</li> <li>- Other countries: Promote introduction of a low emission vehicle (to level of EURO3 or EURO4)</li> </ul> <ul style="list-style-type: none"> <li>Promote the management of chemical substances in products on a global basis</li> <li>- Transition to the management of various chemical substances in products in addition to total abolition of the use of regulated heavy metals</li> <li>- Develop technology enabling a switch to substances with less environmental impact and promote the switch to those substances</li> <li>- Develop and introduce a coolant with a lower global warming coefficient</li> </ul>																														
	Production	15 Reduce substances of concern (SOC) in production activities	<ul style="list-style-type: none"> <li>Continuously promote VOC reduction activities through improvement of daily operations including the reduction of the volume of paint materials and cleaning solvent used in the painting process</li> </ul> <table border="1"> <thead> <tr> <th>Process</th> <th>Region</th> <th>Target (FY2012)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Body paint</td> <td>Japan</td> <td>32g/m<sup>2</sup> or less (average of all lines)</td> </tr> <tr> <td>TMC</td> <td>24g/m<sup>2</sup> or less (average of all lines)</td> </tr> <tr> <td></td> <td>Overseas</td> <td>Highest level in each country</td> </tr> <tr> <td>Other paint</td> <td>Japan &amp; Overseas</td> <td>Promote activities to reduce VOC emission volume</td> </tr> </tbody> </table>	Process	Region	Target (FY2012)	Body paint	Japan	32g/m <sup>2</sup> or less (average of all lines)	TMC	24g/m <sup>2</sup> or less (average of all lines)		Overseas	Highest level in each country	Other paint	Japan & Overseas	Promote activities to reduce VOC emission volume																
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Other paint	Japan & Overseas	Promote activities to reduce VOC emission volume																															
Working Together with Society	<p>16 Implement initiatives to address biodiversity conservation</p> <p>17 Promote social contribution activities that contribute to a society in harmony with nature</p>	<ul style="list-style-type: none"> <li>Promote environmental activities based on the Toyota Biodiversity Guidelines</li> <li>Utilize the Toyota Environmental Activities Grant Program to support activities in Japan and overseas</li> <li>Enhance environmental education at Forest of Toyota and TOYOTA Shirakawa-Go Eco-Institute</li> </ul>																															
Environmental Management	Management	<p>18 Enhance and promote consolidated environmental management</p> <p>19 Promote environmental activities in cooperation with business partners</p> <p>20 Promote CO<sub>2</sub> management worldwide</p> <p>21 Promote ECO-VAS (Eco Vehicle Assessment System) in product development</p> <p>22 Promote sustainable plant activities</p> <p>23 Enhance and promote environmental education activities</p> <p>24 Actively increase disclosure of environmental information and communication</p>	<ul style="list-style-type: none"> <li>Implement activities to ensure the best environmental performance in each country and region through enhancement of environmental-committee activities in Japan and overseas</li> <li>Conform to environmental laws and regulations in all countries and regions, and enhance activities to prevent environmental risks</li> <li>Suppliers: Promote compliance from suppliers, enhance management of SOCs in parts, raw materials, resources and other items supplied to Toyota and request and or support voluntary initiatives to improve environmental performance</li> <li>Dealerships in Japan: Promote and enhance environmental initiatives by thoroughly following the Toyota Dealer CSR (Environment) Guidelines</li> <li>Dealerships overseas: Promote and enhance dealer environmental initiatives led by regional distributors in each country</li> <li>Promote and enhance the Dealer Environmental Risk Audit Program (DERAP)</li> <li>Plan and promote total CO<sub>2</sub> management in global business operations</li> <li>Steadily promote management of target values concerning environmental impact of vehicles by using Eco-Vehicles Assessment System (ECO-VAS) at the development stage</li> <li>Establish a plant that fully utilizes natural resources and operates in harmony with the natural environment, and share resulting knowledge and expertise</li> <li>Promote development of low CO<sub>2</sub>-emitting production technologies, improvement of daily operations, use of renewable energy and tree-planting activities at production plants</li> <li>Raise employee environmental awareness, formulate and implement a systematic environmental education program that contributes to operational improvements</li> <li>Promote environmental education globally in cooperation with consolidated companies</li> <li>Implement Toyota Environment Month events on a global scale</li> <li>Further enhance provision of technological information on environmental products in all countries and regions</li> <li>Continuously issue sustainability reports and improve their content in each country and region</li> <li>Conduct environmental communication activities in all countries and regions</li> </ul>																														

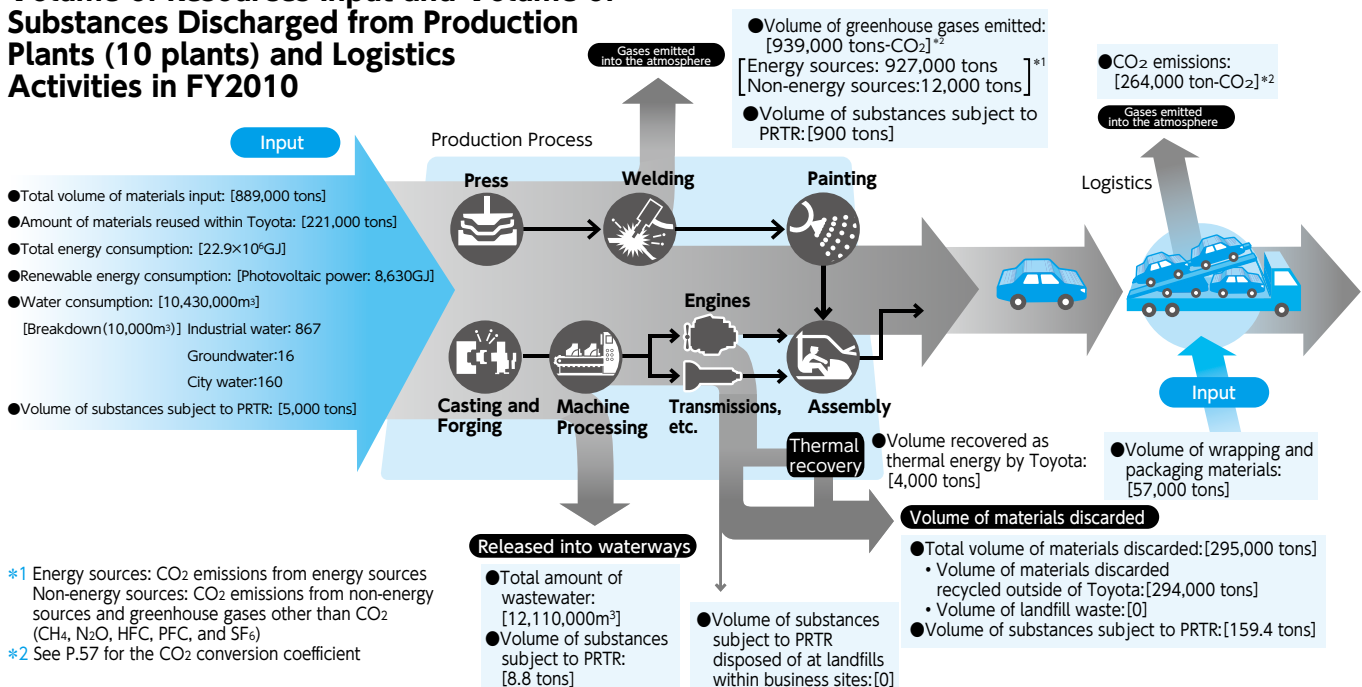
# Appendix

## Status of Major Environmental Data for FY2010

Area	Item	Key indicator (unit)	FY1990	FY1995	FY2008	FY2009	FY2010	Related pages
Product	Exhaust gases	Percentage of total production that achieves emission levels 25% lower than 2000 gasoline standards (No. of models)	—	—	—	—	—	41
		Percentage of total production that achieves emission levels 50% lower than 2000 gasoline standards (No. of models)	—	—	—	—	—	
		Percentage of total production that achieves emission levels 75% lower than 2000 gasoline standards (No. of models)	—	—	—	—	—	
		Percentage of total production that achieves emission levels 50% lower than 2005 gasoline standards (No. of models)	—	—	12.9% (39)	6.7% (35)	4.5% (29)	
		Percentage of total production that achieves emission levels 75% lower than 2005 gasoline standards (No. of models)	—	—	87.1% (119)	93.3% (126)	95.1% (134)	
	Clean-energy vehicles	Number of units sold [units]	—	—	98,137	347,698	343,645	—
		Electric vehicles [units]	—	—	0	0	0	
		Hybrid vehicles [units]	—	—	98,005	347,518	343,542	
		CNG vehicles [units]	—	—	132	180	103	
	Fuel efficiency (Note 1)	Average fuel efficiency by weight category [km/L] (Gasoline-powered passenger vehicles) (Note 1)	703~827kg	17.6	17.6	—	—	—
828~1,015kg			12.3 (average)	12.3 (average)	21.1	21.7	22.6	
1,016 ~1,265kg					18.7	18.5	19.1	
1,266 ~1,515kg					14.6	24.2	26.5	
1,516 ~1,765kg			8.5 (average)	8.0 (average)	12.5	13.5	13.8	
1,766 ~2,015kg					11.5	12.0	11.7	
2,016 ~2,265kg					9.1	10.3	9.8	
2,266kg ~	—	—	7.9	8.6	8.2			
Production	CO <sub>2</sub> (Note 2)	Total emissions volume [calculated in CO <sub>2</sub> equivalent in 10 thousand tons/year]	212 (Note 4)	211	134	122	117	34•35
		Emissions volume per sales unit [calculated in CO <sub>2</sub> equivalent in tons/100 million yen/year]	29.1 (Note 4)	31.2	14.5	14.2	14.2	
	Substances of concern	VOC emissions volume per body area [g/m <sup>2</sup> ]	—	—	24	23	20	41
		Discharge volume of PRTR substances [thousand tons/year]	—	—	1.1	0.9	1.1	40
	Waste (Note 3)	Volume of incineration waste generated [thousand tons/year]	62	41	5.0	2.0	1.2	—
Recycling	Recycling rate	Vehicle recycling/recovery rate [%]	—	—	97	97	97	38

Note 1: The fuel efficiency figures for FY1990 were calculated by converting the figures obtained in the Japanese 10-15 test-drive mode  
 Note 2: Since non-production bases were also brought under the scope of the reduction goals in FY2005, figures include company-wide emissions from FY1990  
 Note 3: Zero landfill waste was achieved in FY2000 and has been maintained ever since  
 Note 4: Total figure for the period from January to December 1990

## Volume of Resources Input and Volume of Substances Discharged from Production Plants (10 plants) and Logistics Activities in FY2010



## Environmental Data for New and Fully Changed Models (Passenger Vehicles) in Japan (FY2010)

Specifications	Name	Ractis	FJ Cruiser	Vitz	CT200h
Vehicle model	DBA-NCP120	CBA-GSJ15W	DBA-NSP130	DAA-ZWA10	
Engine model	1NZ-FE	1GR-FE	1NR-FE	2ZR-FXE	
Transmission	CVT	5AT	CVT	※1	
Start of sales	Nov. 2010	Nov. 2010	Dec. 2010	Jan. 2011	
Greenhouse gases	Amount of HFC134-a used (g) as air conditioning refrigerant	360	600	360	470
Fuel efficiency	CO2 emissions (g/km) (calculated from 10-15 Japanese test mode fuel efficiency values)	116	276	97	68
	Fuel efficiency (10-15 Japanese test mode) (km/L) (Figure reviewed by Ministry of Land, Infrastructure, Transport and Tourism)	20.0	8.4	24.0	34.0
External vehicle noise	Regulation figures for acceleration noise (dB-A)	76	76	76	76
	Specification figures for acceleration noise (dB-A)	75	75	74	74
Exhaust emission levels (2005 Exhaust Emissions Standards)	75% lower than standard levels (SU-LEV)	★★★★	—	★★★★	★★★★
	50% lower than standard levels (U-LEV)	—	★★★	—	—
Substances of concern used in parts	Lead (compared to FY96)				
	Mercury	JAMA goals achieved	JAMA goals achieved	JAMA goals achieved	JAMA goals achieved
	Cadmium				
	Hexavalent chromium				
Recycling	Parts that use easy-to-recycle materials (TSOP)	Bumpers and interior parts	Bumpers and interior parts	Bumpers and interior parts	Bumpers and interior parts
	Natural materials	Deck board (Kenaf, part of models)	—	Deck board (Kenaf)	Deck board, Deck side trim (Bio Plastics)
	Use of recycled resins	—	—	—	Floor cover
	Soundproofing material made from recycled shredder residue (RSPP)	—	—	Floor silencer	Floor mat

※1. Electronically controlled continuously variable transmission  
 ※In principle, the data above relates to the best-selling grade of each vehicle model  
 Note 1: Refer to the chart right below for levels of emission gases from passenger vehicles

### Exhaust Emissions Levels for Gasoline-powered Passenger Vehicles (2005 Standards)

Regulated substances	※New mode Regulation value	50% lower than 2005 standards (☆☆☆)	75% lower than 2005 standards (☆☆☆☆)
CO (g/km)	1.15	←	←
NMHC (g/km)	0.05	0.025	0.013
NOx (g/km)	0.05	0.025	0.013

※New mode: (10-15 mode measured value) × 0.88 + (11 mode measured value) × 0.12

**Continued Reporting** Due to space limitations, some features related to the environment included in the Sustainability Report 2010 could not be included in this year's report. Major developments in these areas are reported below.

Field	Page on FY2010 Report	Detail	Progress
Energy/Global Warming	Development and Design	Page 27	HV overseas production
			Produced 3 models in the U.S., China, Thailand, U.K. and Australia (Prius, Camry, Auris)

## Environmental Awards (FY2010)

Organization	Award Title	Award for
Toyota City	Toyota City's 60th Anniversary Commemorative Award	Cooperation for establishing a society to prevent global warming jointly with Toyota City through Sustainable Plant activities at Tsutsumi Plant
15th Inverse Manufacturing System Symposium executive committee	The 15th Recycling-based Monozukuri Symposium Chunichi Shimibun Award	Reduction of sludge, waste fluid and CO2 emissions by changing lubricants for bonderize chemical treatment, which has a high environmental impact on forging processing, to one lubricant
Society of Automotive Engineers of Japan	FY2010 Technological Development Award	Plug-in hybrid (HV) vehicle is a cleaner, more highly efficient practical technology than conventional HVs. Sales in Japan, the U.S., and Europe played a leading role in the field.

## CO2 Conversion Coefficients to Calculate CO2 Emissions Volume

### (1) Environmental Data in Japan (excluding logistics)

Electricity	0.3817kg-CO2/kWh	Butane gas	3.0094kg-CO2/kg
Heavy oil A	2.7000kg-CO2/L	Natural gas	2.3576kg-CO2/m <sup>3</sup>
Heavy oil C	2.9419kg-CO2/L	Coke	3.2502kg-CO2/kg
Kerosene	2.5308kg-CO2/L	Coal	2.3536kg-CO2/kg

※CO2 conversion coefficient source: Japan Automobile Manufacturers Association, Inc.  
 ※Coefficients from other sources have been used in some instances  
 Please see "CO2 Emissions from Energy Sources at TMC and CO2 Emissions per Sales Unit" on P.35 and "Volume of Resources Input and Volume of Substances Discharged from Production Plants (10 plants) and Logistics Activities in FY2010" on P.56.

### (2) Global Production Environmental Data

• IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds). Published: IGES, Japan.  
 • The 2001 conversion coefficient in CO2 Emissions from Fuel Combustion, 2007 edition, IEA, Paris, France, was used.  
 ※The conversion coefficients specified in the Act on Promotion of Global Warming Countermeasures was used with respect to natural gas, steam, hot water, cooling water and coke furnace gas.  
 ※Corresponds to P.12: CO2 Emissions (from Energy Sources) and CO2 Emissions per Sales Unit (stationary sources such as plants and offices).

### (3) Logistics Data

	FY2006 and earlier	FY2007 and later
Railway (Japan Railway Cargo)	21.7g-CO2/ton-kilometer	22g-CO2/ton-kilometer
Diesel (truck)	2.62kg-CO2/L	2.62kg-CO2/L
Heavy oil C (vessel)	2.99kg-CO2/L	2.98kg-CO2/L

※CO2 conversion coefficient source used for FY2006 and earlier: Railway (Japan Railways Cargo) transport: The Environment, Traffic and Transport, Institution For Transport Policy Studies (ton-kilometer method) Diesel (truck) and C-type heavy oil (ship): Japanese Ministry of the Environment (fuel method) Corresponds to P.35: "TMC CO2 Emissions Volumes in Logistics (Japan)"  
 ※CO2 conversion coefficient source used for FY2007 and later CO2 Emissions Calculation Method for Logistics Operations Joint Guidelines, Ver.3.0 (METI/MLIT) Corresponds to P.35 "TMC CO2 Emissions Volumes in Logistics (Japan)," and P.56 "Volume of Resources Input and Volume of Substances Discharged from Production Plants (10 plants) and Logistics Activities in FY2010."

## Scope of Companies Subject to Consolidated EMS

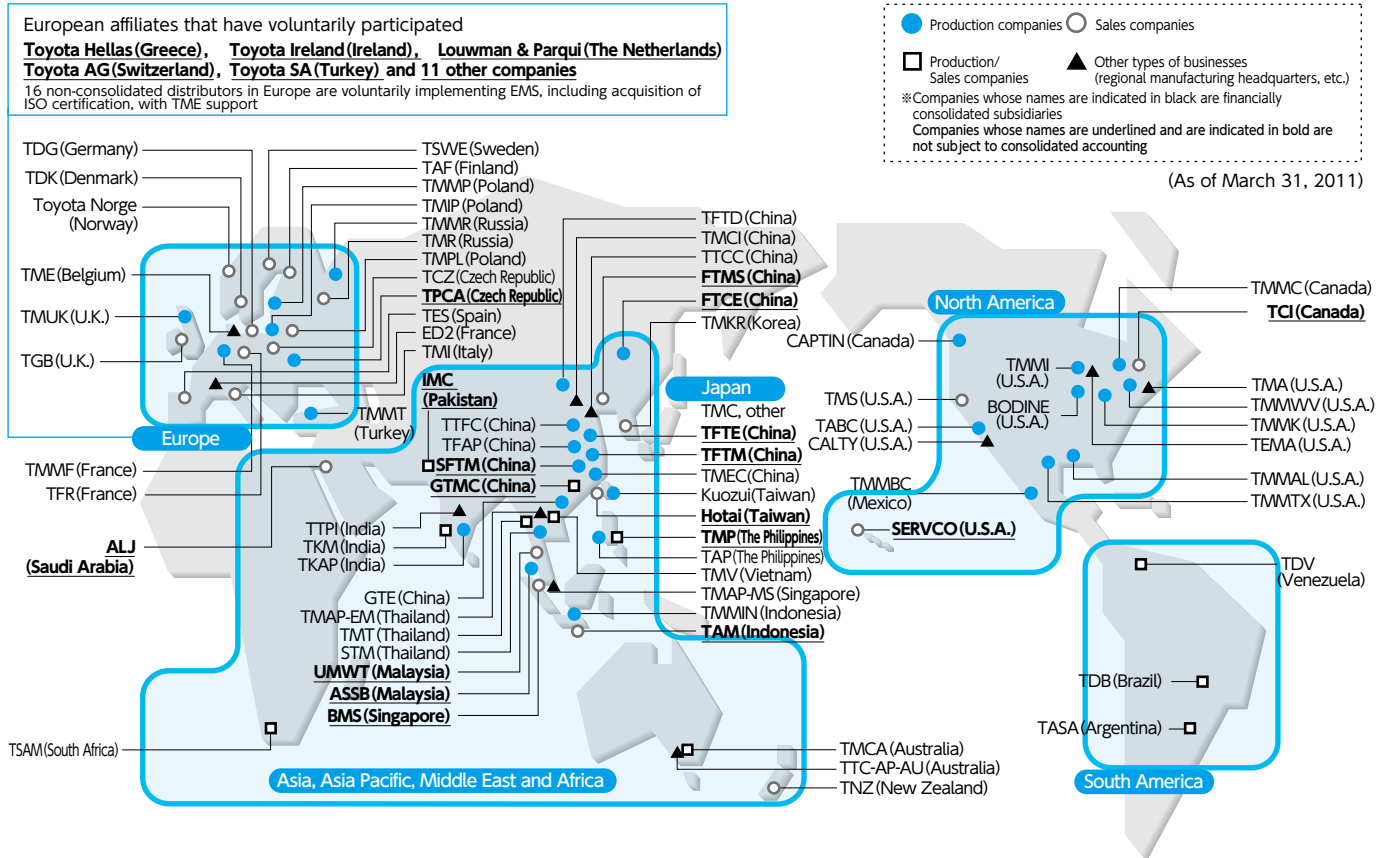
Toyota's consolidated EMS covers a total of 558 companies. This includes not only all financially consolidated subsidiaries, but also major production companies, overseas distributors and other companies not subject to consolidated accounting. Specifically, companies subject to consolidated EMS fall into the following four major categories: (1) 168 subsidiaries which are financially consolidated and under the direct control of TMC; (2) 47 major production companies and overseas distributors that are not subject to consolidated accounting; (3) one organization from other types of businesses; (4) 342 subsidiaries that are financially consolidated and under the indirect control of TMC (managed via consolidated subsidiaries).

## Organization/Structure

1. Jointly adopt the Toyota Earth Charter and draft individual environmental policies
2. In production, set quantitative goals and follow up on those goals
3. In sales, create an environmental management system; reduce environmental impact, make social contributions, and carry out environmental communication in line with the nature of business. In FY2006 begin quantitative management of environmental impact such as CO<sub>2</sub> emissions during logistics activities
4. Implement top level environmental responses based on actual conditions in each country and region

※ TMC's requirements to companies not subject to consolidated accounting may vary according to region and the nature of business

## Main Companies Subject to Consolidated EMS



## Main Companies Subject to Consolidated Environmental Management System (EMS) in Japan (alphabetical order)

Production Companies					Sales Companies	Other Businesses
<b>Group 1</b> • Consolidated subsidiaries • Automotive production companies and others • Toyota secondary companies Central Motor Co., Ltd. Daihatsu Motor Co., Ltd. Gifu Auto Body Industry Co., Ltd. Hino Motors, Ltd. Kanto Auto Works, Ltd. Toyota Auto Body Co., Ltd. Toyota Motor Hokkaido, Inc. Toyota Motor Kyushu, Inc. Toyota Motor Tohoku, Inc.	<b>Group 2</b> • Companies not subject to consolidated accounting • Main parts manufacturers • Body manufacturers, etc. Aichi Steel Corporation Aisan Industry Co., Ltd. Aisin AI Co., Ltd. Aisin AW Co., Ltd. Aisin Seiki Co., Ltd. Aisin Takaoka Co., Ltd. Denso Corporation JTEKT Corporation Tokai Rika Co., Ltd. Toyoda Gosei Co., Ltd. Toyota Industries Corporation Toyota Tsusho Corporation Toyota Boshoku Corporation	<b>Group 3</b> • Consolidated subsidiaries • Parts manufacturers Cataler Corporation Central Motor Wheel Co., Ltd. Kyoho Machine Works, Ltd. Primearth EV Energy Co., Ltd. Yutaka Seimitsu Kogyo, Ltd.	<b>Group 4</b> • Consolidated subsidiaries • Various other products production companies Admatechs Co., Ltd. Japan Chemical Industries Co., Ltd. Shiintec Hozumi Co., Ltd. Toyota Turbine and Systems Inc.	<b>Group 5</b> • Companies not subject to consolidated accounting • Parts manufacturers FTS Co., Ltd. Taiho Kogyo Co., Ltd. Toyoda Iron Works Trinity Industrial Corporation	<b>Toyota Home Tokyo Co., Ltd.</b> Toyota Tokyo Parts Distributor Co., Ltd. Toyota Tokyo Rental & Leasing Co., Ltd. Tokyo Toyopet Motor Sales Co., Ltd. and others Total of 33 companies	Aichi Rikun Co. Tacti Corporation Toyofuji Shipping Co., Ltd. Toyota Central R&D Labs, Inc. Toyota Enterprises Inc. Toyota Modellista International Corporation Toyota Technocraft Co. Toyota Transportation, and others Total of 53 companies ※Includes 1 company that is not subject to consolidated accounting
All-Toyota Production Environment Conference Members					All-Toyota Production Environment Meeting Members	

# Environmental Accounting

## Basic Policy

Environmental accounting at Toyota is based on a classification of environmental costs into "environmental investments\*1" and "maintenance costs\*2." Toyota also calculates economic effects and eco-efficiency. For details on the effects of measures to reduce environmental impact, please see "Status of Major Environmental Data for FY2010" on page 56.

\*1 **Environmental investments:** Environmental costs whose effects are judged to extend beyond the current term into the future  
 \*2 **Maintenance costs:** Environmental costs other than environmental investments

## Environmental Costs

Total environmental costs in FY2010 were 240.8 billion yen, an increase of 23.6 billion yen from the previous fiscal year and accounted for 2.9% of net sales. The increase was the result of research and development as well as awareness building activities in general.

## Economic Effects

(1) Actual Effects (FY2010)

Toyota calculates actual effects by adding savings, such as from "reduction in energy costs" achieved through energy conservation, to income, such as that from "sales of recyclable goods." Income from "sales of recyclable goods" increased due to an increase in unit price.

**Economic Effects (actual effects)** (Unit: Billion yen)

	FY 08	FY 09	FY 10	*FY2010 results of 6 body manufacturers*
Reduction in energy costs	2.3	1.3	1.5	0.6
Reduction in waste processing costs	0.3	1.0	0.3	0
Sales of recyclable goods	12.4	4.4	6.7	7.0
Other (income from environment-related technologies, etc.)	0.7	0.6	6.8	0
<b>Total</b>	<b>15.7</b>	<b>7.3</b>	<b>15.3</b>	<b>7.6</b>

(2) Customer Effects

Total customer effects resulting from replacement by hybrid vehicles were 97.8 billion yen in Japan and 336.9 billion yen worldwide, and cumulative effects since the launch of the first-generation Prius in December 1997 were 277.8 billion yen (Japan) and 995.4 billion yen (worldwide).

## Actual Results of Environmental Expenses

### Actual Results Based on Toyota's Format

(Unit: Billion yen)

Classification	Item	Details	FY08	FY09	FY10	
Environmental investments	Research and development		212.9	192.5	214.8	
	Recycling-related		1.2	1.0	0.7	
	Other expenses (social contribution, ISO certification, education & training, etc.)		2.6	1.7	1.1	
	Plant and equipment investment primarily for environmental action	Plant and equipment investment primarily for environmental action	Prevention of global warming	2.1	1.4	0.7
			Waste processing	0.3	0	0
			Pollution prevention, etc.	1.3	0.4	0.9
	Expenses for environmental action included in normal plant and equipment investment		3.7	1.8	1.6	
Expenses for environmental action included in normal plant and equipment investment		19.7	6.3	6.2		
Subtotal for environmental investments			240.1	203.3	224.4	
Maintenance costs	Expenses related to environmental measures	Waste processing	2.4	2.1	2.0	
		Wastewater treatment	0.4	0.4	0.3	
		Atmospheric pollution and odor abatement	1.1	0.8	0.8	
	Awareness-building	Advertising, public relations, etc.	Global environmental preservation	0.6	0.9	0.8
			Personnel	5.2	(Note) 7.6	10.3
	Professional environmental staff	Personnel	Vehicle recalls	2.3	1.9	1.9
			Soil and groundwater remediation	3.5	0	0
Subtotal for maintenance costs			15.8	13.9	16.4	
<b>Total (As a percentage of net sales)</b>			<b>255.9 (2.8%)</b>	<b>217.2 (2.5%)</b>	<b>240.8 (2.9%)</b>	

\* Depreciation expenses of investments in plant and equipment are not included in these costs  
 Reference: FY2010 Total R&D expense: 635.9 billion yen  
 FY2010 Total capital expenditure: 132.5 billion yen  
 (Note) The figure in FY2009 has been revised due to inclusion of Lexus

## Customer Effects Calculation Method for Japan:

$$(10,000 \text{ km}^{\ast 1} / \text{gasoline-powered vehicle's fuel consumption}^{\ast 2} - 10,000 \text{ km} / \text{hybrid vehicle's fuel consumption}^{\ast 2}) \times 135.9 \text{ yen}^{\ast 3} \times \text{FY2010 hybrid vehicle sales volume}$$

\*1 Average annual distance traveled by passenger cars according to the Japanese Ministry of Land, Infrastructure, Transport and Tourism's "Automobile Transportation Statistics"  
 \*2 10-15 Japanese test mode fuel consumption converted into actual fuel consumption  
 \*3 National average gasoline price (including consumption tax) in FY2010, according to the Oil Information Center in Japan

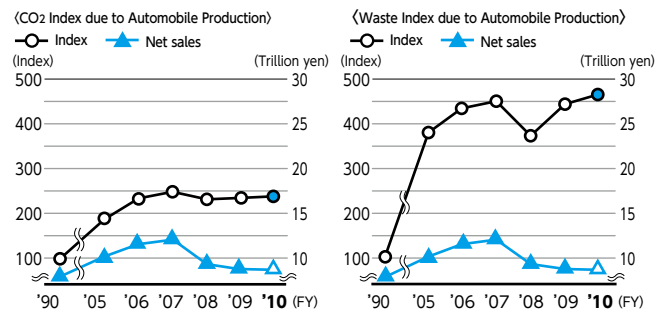
## Eco-efficiency

Toyota calculates eco-efficiency using the formula below and monitors the results in the form of the eco-efficiency index. CO2 emissions volume and the volume of waste generated by the Production Group were used to determine the environmental impact starting with data from FY1990. Over 20 years until FY2010, the CO2 index had increased by 240%, and the waste index by 470%. In the future, Toyota will continue to pursue production that minimizes environmental impact and to enhance eco-efficiency.

### Eco-efficiency Formula

$$\text{Eco-efficiency} = \frac{\text{Net sales}}{\text{Environmental impact}}$$

## Trends in Eco-efficiency (10 Plants only)



\*The "CO2 index" means the ratio of net sales to the volume of CO2 emissions, with a value of 100 assigned to the FY1990 level

\*The "waste index" means the ratio of net sales to the volume of waste generated, with a value of 100 assigned to the FY1990 level

## FY2010 Actual Results Based on the Ministry of the Environment's Format

(Unit: Billion yen)

Classification	Toyota	6 body manufacturers*			
		Investment	Cost		
(1) Business area costs	(1) Pollution prevention	0.4	1.1	0.4	2.2
	(2) Global environmental preservation	7.3	0.8	1.6	0.3
	(3) Resource circulation	0	2.0	0.4	1.7
(2) Upstream/downstream costs	Amount allocated by recycling-related industry organizations	0	0.7	0.1	0.2
(3) Administration costs	Environmental advertisements, environmental report publication, professional environmental staff, etc.	—	13.0	0	2.0
(4) Research and development costs	R&D for reducing substances of concern	—	214.8	1.5	34.3
(5) Social activity costs	Contribution to environmental preservation organizations, etc.	—	0.3	0	0
(6) Environmental remediation costs	Soil and groundwater remediation, etc.	0.1	0.3	0	0
<b>Total</b>		<b>7.8</b>	<b>233.0</b>	<b>4.0</b>	<b>40.7</b>
		<b>240.8</b>		<b>44.7</b>	

\*6 Body manufacturers: Kanto Auto Works, Daihatsu Motor, Toyota Auto Body, Hino Motors, Toyota Motor Kyushu, and Central Motor  
 (Calculations made on the basis of standards used by each company)

## Figures for environmental accounting by overseas affiliates

•TMT (Thailand): Environmental costs : 650 million yen; economic effects: 344 million yen  
 •Kuozui Motors (Taiwan): Environmental costs: 371 million yen; economic effects: 18 million yen

# Independent Report

To improve the accuracy and objectivity of the Environmental Report 2011, the quantitative information concerning Toyota's environmental activities in FY2010, described in pages 12-13 and 33-59 of this report (excluding general information unrelated to Toyota's environmental performance), has undergone a third-party review conducted by Deloitte Tohmatsu Evaluation and Certification Organization Co., Ltd., a subsidiary of Deloitte Touche Tohmatsu LLC and member-firm of Deloitte Touche Tohmatsu. The procedure for the third-party review of this report is as follows:

(1) Review plan development ▶ (2) Review execution ▶ (3) Review reporting ▶ (4) Check the final version ▶ (5) Submit an independent report

(TRANSLATION)

## Independent Review Report

August 10, 2011

Mr. Akio Toyoda,  
President, Toyota Motor Corporation

Deloitte Tohmatsu Evaluation and  
Certification Organization Co., Ltd.  
Chief Executive Officer Hiroshi Inanaga

### 1. Scope of the Review

We have reviewed the "Environmental Report 2011" ("Report") prepared by Toyota Motor Corporation ("Company"). The purpose of our review was to provide limited assurance from an independent practitioner about whether certain quantitative environmental information (excluding publicly released data) for the period from April 1, 2010 to March 31, 2011 included in pp. 12-13 and 33-59 of the Report was accurately measured and calculated in accordance with calculation methods adopted by the Company.

### 2. Responsibility of the Management and Responsibility of the Independent Practitioner

The Report is the responsibility of the Company's management. Our responsibility is to provide our limited assurance with respect to the review performed on the Report from an independent practitioner.

### 3. Summary of Review

To obtain an adequate and valid standard of basis for providing limited assurance with respect to our conclusions, we performed our review with reference to the International Standard on Assurance Engagements (ISAE) 3000 (issued by the International Federation of Accountants in December 2003) and the Proposed Environmental Report Review Standard (issued by the Japanese Ministry of Environment in March 2004).

The review procedures performed for certain of the quantitative environmental information (excluding publicly released data) for the period from April 1, 2010 to March 31, 2011 included in pp. 12-13 and 33-59 of the Report consisted of; 1) agreeing information to summary tables and supporting documents on a sample basis; 2) interviewing the responsible personnel and the persons in charge; 3) reviewing and agreeing information to the relevant minutes, the Company's regulations, and ISO related documents and so on; 4) site visits; and 5) comparing information with other available supporting internal and external materials.

### 4. Conclusions

On the basis of the review procedures described in the preceding paragraph, nothing has come to our attention that caused us to believe the certain quantitative environmental information (excluding publicly released data) for the period from April 1, 2010 to March 31, 2011 included in pp. 12-13 and 33-59 of the Report was not accurately measured or calculated in accordance with calculation methods adopted by the Company, in all material respects.

# Web Sites for Overseas Affiliates' Reports

In 2011 plans call for separate reports to be issued in a total of 15 countries and regions (including Japan) in which Toyota overseas affiliates and other companies operate. The information disclosed globally by these reports will cover about 85% of Toyota vehicles sold worldwide.



Argentina



Australia



Brazil



China



Europe



India



Malaysia  
※Issued in the UMW Holding Report



New Zealand



The Philippines



North America/Canada



South Africa



Taiwan



Thailand



Vietnam

※Coverage rate calculation in previous issues included Daihatsu and Hino Motors. However, since FY2009 it covered Toyota only.

(As of August 2011)

Region/Country	URL
Argentina	<a href="http://www.toyotasustainable.com.ar/">http://www.toyotasustainable.com.ar/</a>
Australia	<a href="http://www.toyota.com.au/toyota/sustainability">http://www.toyota.com.au/toyota/sustainability</a>
Brazil	<a href="http://www.toyota.com.br/images/sustentabilidade_toyota_2010_tcm305.pdf">http://www.toyota.com.br/images/sustentabilidade_toyota_2010_tcm305.pdf</a>
China	<a href="http://toyota.com.cn/corporate/inchina/report.html">http://toyota.com.cn/corporate/inchina/report.html</a>
Europe	<a href="http://www.toyota.eu/sustainability">http://www.toyota.eu/sustainability</a>
India	<a href="http://www.toyotabharat.com/in/en/environment/index.aspx">http://www.toyotabharat.com/in/en/environment/index.aspx</a>
Malaysia	<a href="http://www.umw.com.my/socialresp/GRI/Pages/default.aspx">http://www.umw.com.my/socialresp/GRI/Pages/default.aspx</a>
New Zealand	<a href="http://content.toyota.co.nz/toyota/about_us/sustainability/2009-SDR_Toyota_New_Zealand.pdf">http://content.toyota.co.nz/toyota/about_us/sustainability/2009-SDR_Toyota_New_Zealand.pdf</a>
The Philippines	<a href="http://www.toyota.com.ph/ecosafety/index.asp">http://www.toyota.com.ph/ecosafety/index.asp</a>
North America	<a href="http://www.toyota.com/about/environmentreport2010/">http://www.toyota.com/about/environmentreport2010/</a>
Canada	<a href="http://mediap04.toyota.ca/media/pdf/naer2010_e.pdf">http://mediap04.toyota.ca/media/pdf/naer2010_e.pdf</a>
South Africa	<a href="http://www.toyota.co.za/PictureData/EnvironmentPages/sustainabilityReport/Final%202010%20sus%20report.pdf">http://www.toyota.co.za/PictureData/EnvironmentPages/sustainabilityReport/Final%202010%20sus%20report.pdf</a>
Taiwan	<a href="http://www.kuozui.com.tw/english/index_e.htm">http://www.kuozui.com.tw/english/index_e.htm</a>
Thailand	<a href="http://www.toyota.co.th/en/toyota_csr/sustainable_plant.html">http://www.toyota.co.th/en/toyota_csr/sustainable_plant.html</a>
Vietnam	<a href="http://www.toyotavn.com.vn/profiles/index/126">http://www.toyotavn.com.vn/profiles/index/126</a>

※Where no direct URL to an affiliate's report is available, the URL to the environmental initiatives or CSR activities page of the corresponding affiliate's Web site has been provided.

Web sites for Overseas Affiliates' Reports can also be accessed from TMC's global Web site: <http://www.toyota-global.com/sustainability/report/overseas/>

## TMC's Main Information Disclosure Tools

In addition to environmental reports, TMC uses the following tools to disclose information concerning its activities, data, and approaches. Please make use of these information sources as well.

### Annual Report 2011

The Right Way Forward

[http://www.toyota-global.com/investors/ir\\_library/annual/](http://www.toyota-global.com/investors/ir_library/annual/)

### Toyota In the World 2011

Databook

[http://www.toyota-global.com/company/profile/overview/in\\_the\\_world/](http://www.toyota-global.com/company/profile/overview/in_the_world/)

### Sustainability Report 2011

Full Version (PDF)/Digest Version

<http://www.toyota-global.com/sustainability/report/sr/>

## Company Outline

Name: TOYOTA MOTOR CORPORATION  
Date of establishment: August 28, 1937  
Principal operations: Manufacturing and sales of automobiles and housing  
Capital: 397.0 billion yen

Number of shareholders: 652,568  
Total number of shares issued: 3,447,997 thousand  
Stock exchanges on which the shares are listed: Japan: Tokyo, Nagoya, Osaka, Fukuoka and Sapporo  
Overseas: New York and London

Note: Capital amounts and number of shareholders are as of the end of March 2010. Capital less than 0.1 billion yen is rounded off.

Head Office: 1, Toyota-cho, Toyota City, Aichi Prefecture, Japan 471-8571 TEL: +81-565-28-2121  
Tokyo Head Office: 4-18, Koraku 1-chome, Bunkyo-ku, Tokyo, Japan 112-8701 TEL: +81-3-3817-7111  
Nagoya Office: 4-7-1 Meieki, Nakamura-ku, Nagoya City, Aichi Prefecture 450-8711 TEL: +81-52-552-2111

### Major production bases in Japan

Automobiles: Honsha Plant, Motomachi Plant, Kamigo Plant, Takaoka Plant, Miyoshi Plant, Tsutsumi Plant, Myochi Plant, Shimoyama Plant, Kinuura Plant, Tahara Plant, Teiho Plant, Hirose Plant  
Housing: Kasugai Housing Works, Tochigi Housing, Yamanashi Housing Works



Toyota Loops is a special-purpose subsidiary of Toyota Motor Company, founded to provide employment for seriously disabled persons so there will be more opportunities for the disabled to find employment. Toyota Loops handles in-house printing, intra-company mail reception and delivery, and other such operations that were previously done inside the company. Toyota Loops handles the printing and binding of this report.



Company name: Toyota Loops Corporation  
 Head Office: 15-1 Toyota-cho, Toyota-shi, Aichi Pref. 471-8571  
 URL: <http://www.toyota-loops.co.jp>



Universal design fonts are used to effectively convey information to more people. The fonts are composed of characters with ample space to ensure high visibility and readability, and their simple shapes prevent mistakes in reading and have appealing design aesthetics. Morisawa repeatedly tested the fonts under difficult visual conditions and designed them for easy recognition by people of all ages, regardless of eyesight or environment.



[Editing, Plate Making] This report is compiled using the Computer to Plate (CTP) system, resulting in the total elimination of film, an intermediate material, during the plate making process.

[Paper] Printed on paper made with wood from forest thinning, "Morino Chonai-Kai" (Forest Neighborhood Association)—Supporting sound forest management.



[Ink] The ink used contains less than 1% VOC (volatile organic compound) as petroleum-based solvents are replaced by vegetable oil-based solvents, principally soybean oil.

Toyota has participated in activities of WBCSD (World Business Council for Sustainable Development) as a member.



World Business Council for Sustainable Development

Toyota is a supporter of Education for Sustainable Development (ESD). ESD activities are aimed at creating a sustainable society.



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To view this report online: <http://www.toyota-global.com/sustainability/report/er/>