

# Environmental Report 2018

— Toward the Toyota Environmental Challenge 2050 —

Fiscal Year Ended March 31, 2018



## Environmental Report 2018 —Toward the Toyota Environmental Challenge 2050—

### Editorial Policy

Toyota Motor Corporation considers environmental issues to be one of its management priorities. Since 1998, we have published an annual Environmental Report to explain our environmental initiatives. From FY2017, the content of the report is presented in conformance with the six challenges defined under our long-term initiative, the Toyota Environmental Challenge 2050. The Environmental Report is a specialized publication excerpted from the Sustainability Data Book. It covers only our environmental initiatives. For information on Toyota's CSR management and initiatives, please refer to our Sustainability Data Book 2018. We have also published the Annual Report, in which Toyota shares with our stakeholders the ways in which Toyota's business is contributing to the sustainable development of society and the Earth on a comprehensive basis from a medium- to long-term perspective.

### Period Covered by Report

The data featured in this report covers the fiscal year 2018, from April 2017 to March 2018. For major ongoing initiatives, data from April 2018 onward is also included.

### Scope of Report

The report covers Toyota Motor Corporation (TMC) initiatives as well as the activities of consolidated subsidiaries and affiliates in Japan and overseas.

### Reference Guidelines

- Ministry of the Environment of Japan "Environmental Reporting Guidelines" 2012 version
- A GRI Sustainability Reporting Guidelines comparison chart is available on the website

[Web https://www.toyota-global.com/sustainability/csr/gri](https://www.toyota-global.com/sustainability/csr/gri)

### About the Icons

[Third-Party Assurance](#) Denotes data confirmed through Independent Practitioner's Assurance

### Annual Report [https://www.toyota-global.com/investors/ir\\_library/annual/](https://www.toyota-global.com/investors/ir_library/annual/)

#### Securities Reports (Japanese text only)

<https://www.toyota.co.jp/jpn/investors/library/negotiable/>

#### U.S. SEC Filings

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

#### Financial Results

[https://www.toyota-global.com/investors/financial\\_result/](https://www.toyota-global.com/investors/financial_result/)

#### Corporate Governance Reports

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

### Sustainability Data Book 2018

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

#### Environmental Report 2018

—Toward the Toyota Environmental Challenge 2050—

<https://www.toyota-global.com/sustainability/report/er/>

- The Toyota website also provides information on corporate initiatives not included in the above reports.
 

Sustainability	<a href="https://www.toyota-global.com/sustainability/">https://www.toyota-global.com/sustainability/</a>
Environment	<a href="https://www.toyota-global.com/sustainability/environment/">https://www.toyota-global.com/sustainability/environment/</a>
Social Contribution Activities	<a href="https://www.toyota-global.com/sustainability/social_contribution/">https://www.toyota-global.com/sustainability/social_contribution/</a>

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## Overview of Toyota Motor Corporation

### Company Profile

Company Name	Toyota Motor Corporation
President and Representative Director	Akio Toyoda
Company Address	
Head Office	1 Toyota-cho, Toyota City, Aichi Prefecture, Japan
Tokyo Head Office	1-4-18 Koraku, Bunkyo-ku, Tokyo, Japan
Nagoya Office	4-7-1 Meieki, Nakamura-ku, Nagoya City, Aichi Prefecture, Japan
Date Founded	August 28, 1937
Capital	635.4 billion yen (as of end of March, 2018)
Main Business Activities	Motor Vehicle Production and Sales
No. of Employees (consolidated)	369,124 (as of end of March, 2018)
No. of Consolidated Subsidiaries	606 (as of end of March, 2018)
No. of Affil. Accounted for under the Equity Method	57 (as of end of March, 2018)

### Non-automotive Business



#### Financial Services

Provides financial services for vehicle loans and leasing in more than 30 countries and regions worldwide.



#### Housing

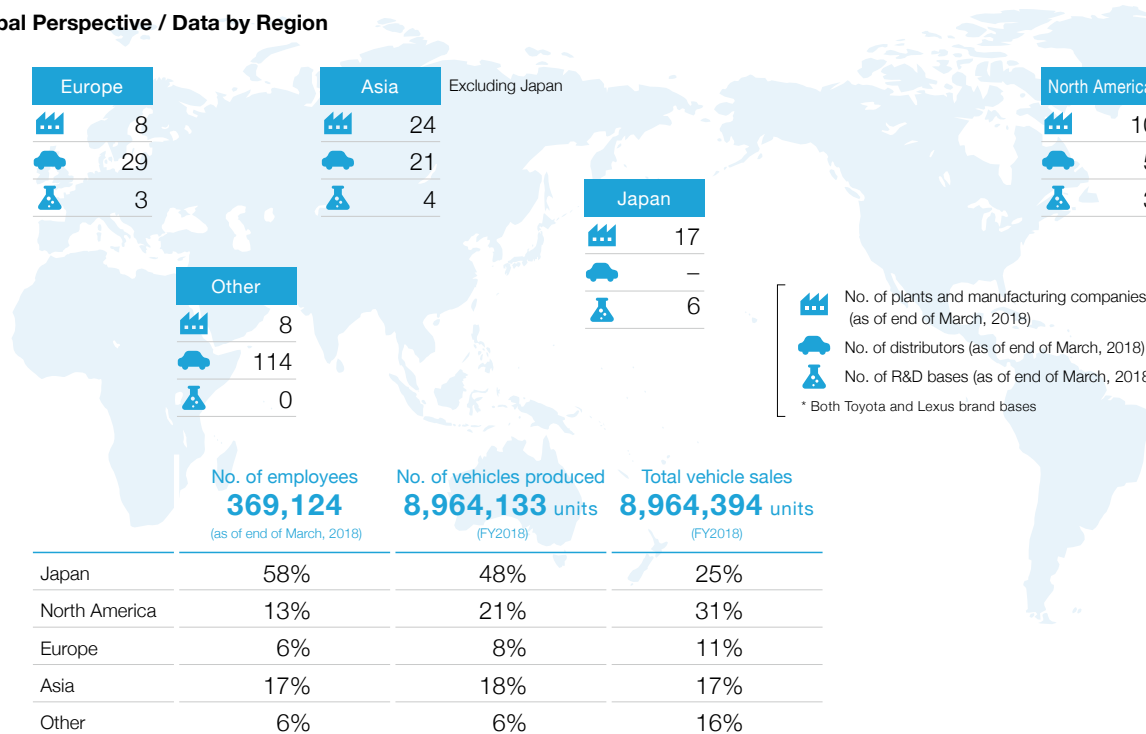
Consolidating the Toyota Group's knowledge to offer a wide variety of housing services to meet different customer needs.



#### Other Business

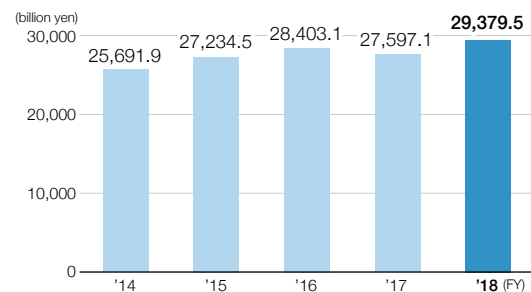
Toyota is also involved in marine business, as well as biotechnology and afforestation business.

### Global Perspective / Data by Region

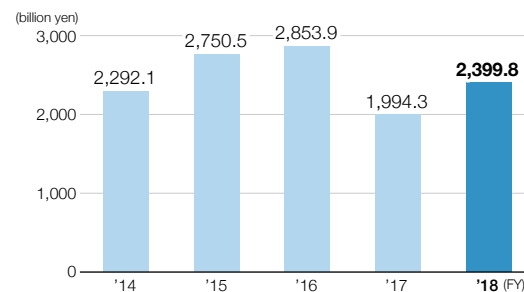


## Consolidated Financial Highlights Based on U.S. GAAP—Generally Accepted Accounting Principles (Financial years ended March 31)

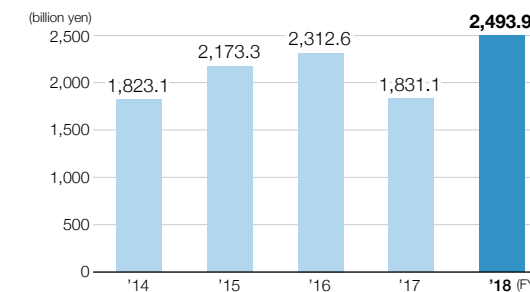
### Net Revenues



### Operating Income

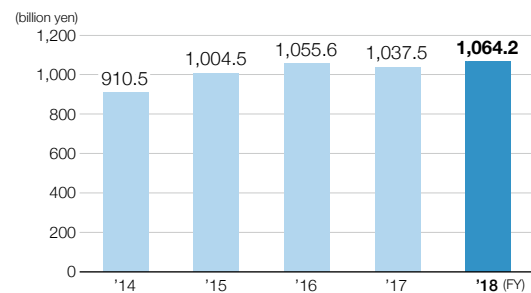


### Net Income

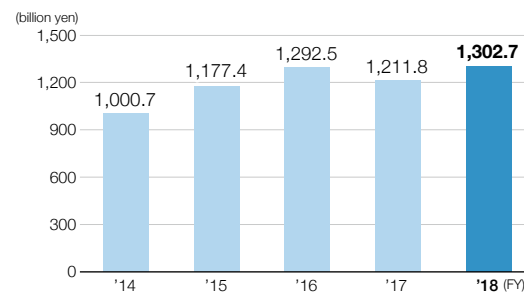


• Shows the net income attributable to the shareholders of Toyota Motor Corporation

### R&D Expenses



### Capital Expenditures



• Capital expenditure excludes vehicles for leasing

## Highlights

### “A List” top ranking on CDP corporate climate change and water management survey

In the 2017 report, which summarizes the CDP's\* survey of corporate responses to climate change, water management, and other topics, Toyota was selected for the “A List,” the highest score, in two consecutive years for climate change and in three consecutive years for water management.



\* CDP: A UK-based nonprofit organization which acts on behalf of the world's institutional investors to request information disclosures from leading companies on climate change, water and forestry resources. CDP analyzes and assesses survey results, sharing the information with institutional investors.

### Marks 20th anniversary of Prius Launch

Since the 1997 launch of the Prius as the world's first mass-produced hybrid passenger vehicle, Toyota has endeavored to create a new era and in 2017 celebrated 20 years of the Prius.



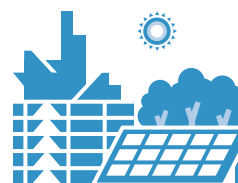
### The Environmental Report 2017 wins an Excellence Prize in the Environmental Report category of the 21st Environmental Communication Awards presented by Ministry of the Environment of Japan and other organizations

Toyota has been widely acclaimed for setting highly-motivated environmental goals known as the Toyota Environmental Challenge 2050, and explaining clearly its specific initiatives and progress in achieving the goals, along with quantitative data.



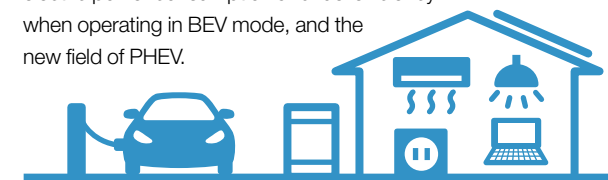
### Wins the 2017 Environment Minister's Award for Global Warming Prevention Activity (countermeasures practice and expansion category)

Toyota was recognized for the notable success in preventing global warming of its global warming prevention countermeasures in waste treatment and measures relating to the establishment of the Plant in Harmony with Nature project.



### The plug-in system of the new Prius PHV wins the 2017 Minister of Economy, Trade and Industry Award in the energy-saving category

The award recognizes multiple new technologies, the overall improvement in environmental performance including the improved electric power consumption and fuel efficiency when operating in BEV mode, and the new field of PHEV.



### Cumulative global sales of hybrid electric vehicles (HEVs): Approx. 12 million units



## Message from the Head of the Company

# Connecting the Earth, Our Beautiful Hometown, to the Future



Firstly, I would like to express my sincere gratitude for your continued support and understanding.

In recent years, abnormal weather phenomena have threatened the lives of people in many regions around the world. Global warming is said to be a cause of these phenomena, and I believe that if each of us does not address this issue head-on, the sustainable development of humankind will not be possible. Countries around the world are taking action to balance emissions and absorption of CO<sub>2</sub> and greenhouse gases in the second half of this century so that temperature increase can be limited to less than 2°C.

On the other hand, the automobiles that we produce and nearly all of our activities generate CO<sub>2</sub> emissions. I believe that the problem of global warming, or CO<sub>2</sub> emissions, is the issue that goes to the very roots of how we will live.

Since its foundation, Toyota has continuously undertaken the challenges of car manufacturing for the smiles of future generations. We will not be able to leave a beautiful Earth to future generations unless we take the environment into consideration in our car manufacturing, in addition to safety, security, and *waku-doki* (excitement and exhilaration that wows you).

Toyota's history of car manufacturing is also the history of persistently addressing environmental issues.

The accumulated efforts of our predecessors have become assets to those living today. Such efforts include development of catalysts to address emission matters, and electrification of motor vehicles including hybrid electric vehicles, plug-in hybrid electric vehicles, battery electric vehicles, and fuel cell electric vehicles to raise energy efficiency and adopt fuel diversification. As a company whose vocation is automobile business, I believe that it is our responsibility to succeed the efforts of our predecessors and actively face environmental issues.

Toyota established the Toyota Environmental Challenge 2050 and has been taking action not just to contribute to keeping global warming below 2°C through zero CO<sub>2</sub> emissions, but also to have a positive impact on the Earth. In this year's environmental report, we set the 2030 Milestone including selling at least 5.5 million electrified vehicles annually by 2030 to clarify the path we will take.

Toyota will unceasingly carry out its transformation in order to connect the Earth, our beautiful hometown, to the future.

We kindly request the continued support and understanding of all our stakeholders.

September 2018

**Akio Toyoda**

President, Member of the Board of Directors  
Toyota Motor Corporation





## Toyota Environmental Challenge 2050—Going Beyond Zero Environmental Impact and Achieving a Net Positive Impact

We have formulated the Toyota Earth Charter based on the Guiding Principles at Toyota, considering environmental issues as a paramount importance, and have established its promotion structure to address such issues. In the course of perceiving public opinions or world trends and while considering our focus in the years to come, Toyota is working on this problem with new ideas and technologies ahead of future challenges. In October 2015, we formulated six challenges based on piles of environmental issues and we have been moving ahead, aiming to establish a future society in harmony with nature.

### Six Environmental Challenges to Be Achieved by Toyota Toward 2050

In the “estimation of greenhouse gas concentrations and rising temperatures by 2100” scenario from the Fifth Assessment Report of the IPCC Working Group, there are several scenarios in which the atmosphere temperature in 2100 rises will be suppressed by less than 2°C over pre-industrial levels, but in any case, it is estimated that:

- Greenhouse gas emissions in 2050 will be reduced 40–70 percent over 2010
- Greenhouse gases will be almost zero or minus by 2100

Toyota has promoted a wide range of initiatives to address increasingly severe global environmental issues, such as extreme weather phenomena attributed to greenhouse gas emissions, biodiversity depletion due to development, and water shortages caused by population growth. In October 2015, we announced the “Toyota Environmental Challenge 2050,” and we have been striving to reduce the environmental burden attributed to automobiles to as close to zero as possible, while developing measures to contribute a positive impact on the Earth and its societies with the aim of achieving a sustainable society.

#### Serious Environmental Issues of the Earth and Society

- |  |   |
|--|---|
| •Extreme weather attributed to GHG emissions | •Resource depletion such as metals                                  |
| •Aggravated air pollution in cities          | •Fragmentation of ecosystem due to development progress             |
| •Water shortages due to population growth    | •Degrading biodiversity due to ecosystem changes and climate change |

# TOYOTA ENVIRONMENTAL CHALLENGE 2050



### Processes to Identify and Implement the Key Challenges (Materiality)

Environmental challenges may involve both business risks and opportunities. It is therefore essential to identify key challenges (materiality) from both risk and opportunity perspectives when formulating a long-term vision. In order to grasp the potential risks and business opportunities, Toyota has collected information, analyzing and identifying environmental challenges from the standpoints of their importance for both stakeholders and our business.

STEP  
1

#### Collect and Analyze Information

We examined a wide range of global trends in collecting and analyzing information. These include scientific predictions for the environment in 2050, global frameworks and policy trends, development in emerging countries, major index from external rating agencies, and world leaders' remarks on environmental issues at G7 Summits. This broad examination provided us with an understanding of macroeconomic trends and important needs of societies, leading us to grasp potential risks and opportunities.

STEP  
2

#### Identify Environmental Challenges (Materiality)

We identified environmental challenges (materiality) through analysis of both the external and internal environments. Our analysis of the external environment is derived from ESG investor and research organization surveys and major indices, along with communication with stakeholders including international organizations, NGOs, and consumers, while the internal analysis is based on the Guiding Principles at Toyota, the Toyota Earth Charter, and discussions among internal concerned divisions.

STEP  
3

#### Identify Key Challenges (Materiality)

We identified the key environmental challenges (materiality) by considering two aspects, which are the influence on stakeholders, and impacts on our potential business risks and opportunities. This helped us prioritize the importance of key challenges.

STEP  
4

#### Toyota Environmental Challenge 2050 Formulation, Regular Review, and Information Disclosure

High priority challenges for both stakeholders and Toyota were formulated in the Toyota Environmental Challenge 2050 (Six Challenges) and approved by the Corporate Planning Meeting (current “Sustainability Meeting”), which decides our medium- to long-term strategies. Steady implementation of our challenges requires management's recognition of environmental activities as potential business opportunities and effective investments, in addition to involving Group companies to strengthen collaboration with our business partners. We will review and evaluate our action plans on a regular basis.



## Special Feature 2030 Milestone Set in Order to Achieve the Toyota Environmental Challenge 2050

In December 2017, Toyota announced its challenge toward the popularization of electrified vehicles for the decade from 2020 to 2030 as a pillar in the development and expansion of electrified vehicles, which is one of the medium- to long-term initiatives to realize the Toyota Environmental Challenge 2050. The 2030 Milestone indicates how the six challenges will be as of 2030, including the details of this announcement. These activities are being further proceeded along with the Toyota Environmental Action Plan that sets the specific action plans and targets for every five-year period in order to contribute to the realization of a sustainable society.

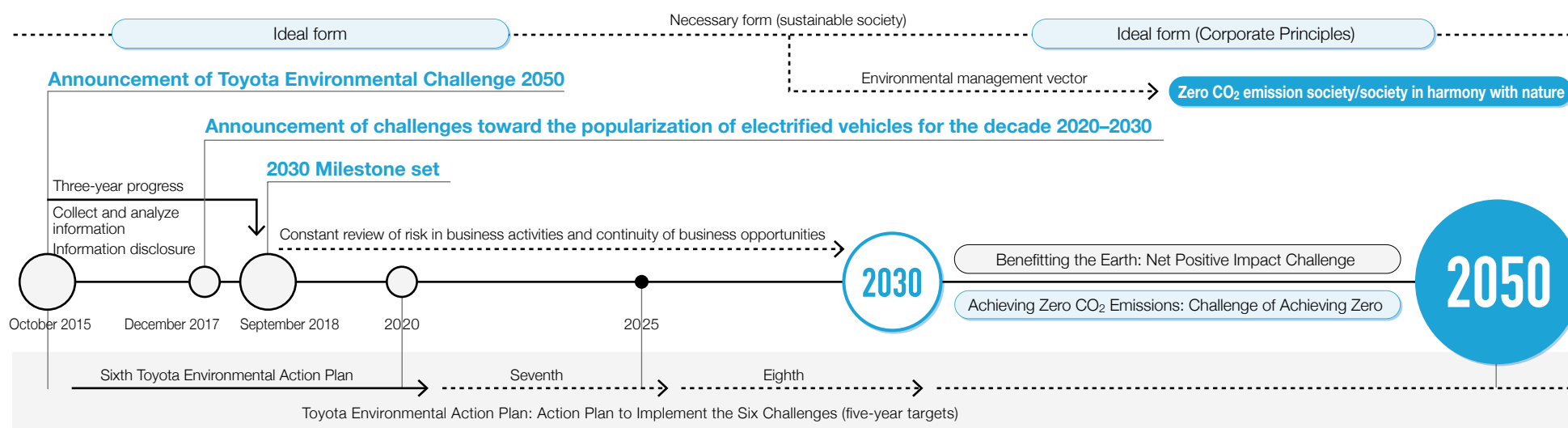
### 2030 Milestone Set

Toyota has been proactive in the development and marketing of electrified vehicles by introducing the iconic Prius in 1997, and by working to make it widely adopted for the following 20 years. Cumulative electrified vehicle sales as of April 2018 have reached 12 million units, which has reduced CO<sub>2</sub> emissions by 94 million tons. As the CO<sub>2</sub> emissions volume of Tokyo in 2015 was 60.84 million tons of CO<sub>2</sub><sup>1</sup>, the effect of reducing CO<sub>2</sub> emissions contributed by the widespread adoption of electrified vehicles is incredibly large. For that reason, by achieving the 2030 milestone of “annual total electrified vehicle sales of 5.5 million units, including sales of 1 million or more battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs),” we estimate that CO<sub>2</sub> emissions will be reduced by 35 percent over 2010<sup>2</sup>.

On the other hand, even though the environmental burden during the operation of electrified vehicles is low, CO<sub>2</sub> emissions during the production stage are greater than those of a gasoline vehicle of the same class. For that reason, it is necessary to set quantitative milestones for the production stage. In addition to reducing CO<sub>2</sub> emissions in every stage of the vehicle lifecycle (production of materials, parts production/vehicle assembly, operation, maintenance and disposal), the 2030 Milestone sets quantitative and qualitative milestones for other challenges, including the establishment of a recycling-based society and living in harmony with nature, which will accelerate further reduction of the environmental burden and accomplish a net positive impact.

1 Source: Tokyo Metropolitan Government Bureau of Environment “Final Energy Consumption and Greenhouse Gas Emissions in Tokyo”

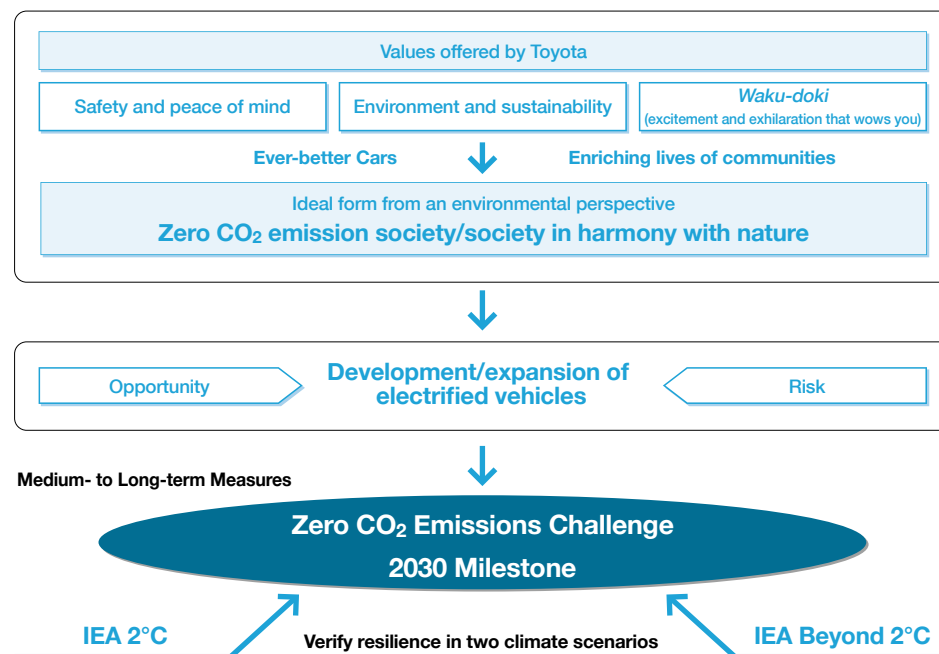
2 Estimate values. Values may change depending on the market situation and other factors.



## Climate-related Scenario Analysis

In order to realize the Toyota Environmental Challenge 2050, the 2030 Milestone was established based on the current situation of Toyota and social trends. In the setting of the Milestone, based on “different climate-related scenarios, including a 2°C or lower scenario,” the influence that climate change will have on Toyota was analyzed and resilience of Toyota’s medium- to long-term strategy was verified. The climate scenarios mentioned above referred to those equivalent to “2°C” and “Beyond 2°C” in the International Energy Agency (IEA) report, and electrified vehicle sales and production activities at plants were analyzed.

### Investigation Process



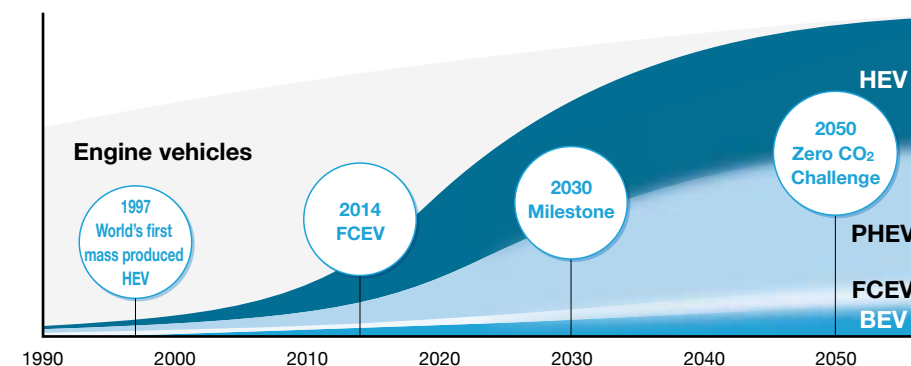
## Results of Verification in Two Scenarios

### ■ Electrified vehicle sales

With regard to the ratio of electrified vehicles including hybrid electric vehicles (HEVs), the ratio in the 2030 Milestone exceeds the levels both in the “2°C” and “Beyond 2°C” climate scenarios. On the other hand, although the ZEV\* ratio surpasses that in “2°C,” it does not reach the level of “Beyond 2°C.” However, through the development of HEVs, Toyota has been establishing a mass production base by cultivating the component technologies essential to electrified vehicles. These technologies will also be applicable to ZEV, and Toyota is capable of making flexible and strategic changes to the powertrains and line-ups according to changes in demand. As we look toward “Beyond 2°C,” we will make flexible decisions on the necessity to change the line-ups by monitoring various indicators to grasp global trends.

\* ZEV (Zero Emission Vehicle): Vehicles with zero CO<sub>2</sub> emissions at the driving phase

### Vehicle Electrification Milestones



### ■ Production activities at plants

Carbon pricing policies have been in discussion globally toward the achievement of the 2°C target. In terms of the financial risk from this policy, there may be a cost increase due to the carbon price according to CO<sub>2</sub> emissions from energy usage emission. However, Toyota has been globally promoting CO<sub>2</sub> emissions reduction at plants in the Toyota Environmental Challenge 2050 and 2030 Milestone. On this basis, we expect to reduce costs from carbon pricing and energy purchase costs by energy-saving and energy creation. Therefore, measures for the 2030 Milestone can lower the financial impact due to carbon pricing.

## The milestones Toward the Toyota Environmental Challenge 2050 as of 2030 are shown below

### Toyota Environmental Challenge 2050

#### Challenge 1 New Vehicle Zero CO<sub>2</sub> Emissions Challenge

Reduce global average CO<sub>2</sub> emissions during operation from new vehicles by 90% from Toyota's 2010 global level



#### 2030 Milestone

- Make annual global sales of **more than 5.5 million** electrified vehicles, including **more than 1 million** zero-emission vehicles (BEVs and FCEVs)
- The estimate of global average CO<sub>2</sub> emissions reduction in g-CO<sub>2</sub>/km from new vehicles will be **35% or more**, which may vary depending on market conditions, compared to 2010 levels

### Toyota Environmental Challenge 2050

#### Challenge 4 Challenge of Minimizing and Optimizing Water Usage

Minimize water usage and implement water discharge management based on individual local conditions



#### 2030 Milestone

- Implement measures, on a priority basis, in the regions where the water environment is considered to have a large impact <Water quantity> Complete measures at the **4 Challenge-focused plants** in North America, Asia and Southern Africa <Water quality> Complete impact assessments and measures at **all of the 22 plants** where used water is discharged directly to river in North America, Asia and Europe
- Disclose information appropriately and communicating actively with local communities and suppliers

### Toyota Environmental Challenge 2050

#### Challenge 2 Life Cycle Zero CO<sub>2</sub> Emissions Challenge

Completely eliminate all CO<sub>2</sub> emissions from the entire vehicle life cycle



#### 2030 Milestone

- Reduce CO<sub>2</sub> emissions by **25% or more** over the entire vehicle life cycle compared to 2013 levels by promoting activities for the milestones of Challenges 1 and 3, and with support from stakeholders such as suppliers, energy providers, infrastructure developers, governments and customers



### Toyota Environmental Challenge 2050

#### Challenge 5 Challenge of Establishing a Recycling-based Society and Systems

Promote global deployment of End-of-life vehicle treatment and recycling technologies and systems developed in Japan



#### 2030 Milestone

- Complete establishment of battery collection and recycling systems globally
- Complete set up of **30 model facilities** for appropriate treatment and recycling of End-of-life vehicles

### Toyota Environmental Challenge 2050

#### Challenge 3 Plant Zero CO<sub>2</sub> Emissions Challenge

Achieve zero CO<sub>2</sub> emissions at all plants worldwide by 2050



#### 2030 Milestone

- Reduce CO<sub>2</sub> emissions from global plants by **35%** compared to 2013 levels

### Toyota Environmental Challenge 2050

#### Challenge 6 Challenge of Establishing a Future Society in Harmony with Nature

Connect nature conservation activities beyond the Toyota Group and its business partners among communities, with the world, to the future



#### 2030 Milestone

- Realize "Plant in Harmony with Nature" — **12 in Japan and 7 overseas** — as well as implement harmony-with-nature activities in all regions where Toyota is based in collaboration with local communities and companies
- Contribute to biodiversity conservation activities in collaboration with NGOs and others
- Expand initiatives both in-house and outside to foster environmentally conscious persons responsible for the future

## Risks and Opportunity Recognition in Toyota Environmental Challenge 2050

When it comes to making management decisions Toyota recognizes the various risks arising from global environmental problems and then conduct activities against them toward the Toyota Environmental Challenge 2050, taking it as an opportunity for Toyota to enhance its sustainable competitiveness.

Of the risks attributed to climate change, the risk of disasters due to abnormal weather not only affects business continuity but also threatens the lives of people around the world and hinders sustainable development. Regulatory risks such as fuel consumption regulations and energy-saving regulations may also lead to increased costs for vehicle and production activities and lost sales opportunities due to a delay in responding to regulations.

Toyota considers it is possible to create more sales opportunities by promptly responding to regulatory risks, as well as contributing to the world sustainable development through undertaking the zero challenges of Challenges 1 to 3, which will help mitigate the physical risks due to climate changes.

As for water resources, although the details and extent of risks are different in each region of operation, if water is used in excess or if polluted water is discharged, there will be a huge impact on the regional water environment, and operations may not be permitted. With regard to the use of resources, there is a risk that production will be delayed due to resource depletion, and the risk of the need to impose an unnecessary duty for processing on manufacturers due to the inappropriate treatment of End-of-life vehicles in each country and region.

Risks from the loss of biodiversity also includes the risk of impacting the surrounding ecosystem due to inappropriate development and operation, as well as the risk of damaging sustainable development due to the loss of the affluent natural environment on a global scale. By means of Challenges 4 to 6, Toyota is not only minimizing these risks and impacts but also making a positive contribution in each region, which we recognize leads to trust being gained from each region and further raises business sustainability and sales opportunities.

## Results and Progress of the Six Challenges and Future Activities

	Toyota Environmental Challenge 2050
 <b>CHALLENGE 1</b> <b>New Vehicle Zero CO<sub>2</sub></b>	<b>Reduce global average CO<sub>2</sub> emissions during operation from new vehicles by 90% from Toyota's 2010 global level</b> <b>[ Activities ]</b> Accelerate widespread use of next-generation vehicles to save energy and respond to diverse range of fuels <ul style="list-style-type: none"> <li>• Accelerate global expansion of hybrid vehicles and plug-in hybrid vehicles</li> <li>• Accelerate widespread use of fuel cell, electric, and other ZEV<sup>1</sup></li> </ul> <p><sup>1</sup> ZEV (Zero Emission Vehicle): Vehicles which do not emit CO<sub>2</sub> at all during operation</p>
 <b>CHALLENGE 2</b> <b>Life Cycle Zero CO<sub>2</sub></b>	<b>Completely eliminate all CO<sub>2</sub> emissions from the entire vehicle life cycle</b> <b>[ Activities ]</b> Reduce CO <sub>2</sub> emissions along the entire vehicle life cycle, from materials production, parts and vehicle manufacturing to driving and disposal stage <ul style="list-style-type: none"> <li>• Reduce CO<sub>2</sub> emissions during materials production by developing and expanding use of low-emission materials</li> <li>• Promote eco-friendly actions through wider use of recycled materials</li> </ul>
 <b>CHALLENGE 3</b> <b>Plant Zero CO<sub>2</sub></b>	<b>Achieve zero CO<sub>2</sub> emissions at all plants by 2050</b> <b>[ Activities ]</b> At all production plants, develop and adopt low-CO <sub>2</sub> technologies and implement daily kaizen, while promoting the use of renewable energy and hydrogen <ul style="list-style-type: none"> <li>• Reduce CO<sub>2</sub> emissions per unit at newly established plants to one third by 2030 (in comparison to 2001) by simplifying and streamlining production processes and taking innovative energy-saving measures</li> <li>• Adopt renewable energies at plants, including the use of wind power produced on-site at our Tahara Plant by around 2020</li> </ul>
 <b>CHALLENGE 4</b> <b>Minimizing and Optimizing Water Usage</b>	<b>Minimize water usage and implement water discharge management based on individual local conditions</b> <b>[ Activities ]</b> Promote activities from the two perspectives of water volume and water quality <ul style="list-style-type: none"> <li>• Reduce water usage in existing production processes as well as introducing technologies reducing industrial water usage through rainwater use and improving water recycling rates</li> <li>• Manage water discharge quality by complying with strict standards, improving the local environment by returning clean water for nature</li> </ul>
 <b>CHALLENGE 5</b> <b>Establishing a Recycling-based Society and Systems</b>	<b>Promote global deployment of End-of-life vehicle treatment and recycling technologies and systems developed in Japan</b> <b>[ Activities ]</b> Establish a recycling-based society with four key features: use eco-friendly materials; use auto parts longer; develop recycling technologies; and manufacture vehicles from End-of-life vehicles Two global projects started in 2016: <ul style="list-style-type: none"> <li>• Toyota Global 100 Dismantlers<sup>2</sup> Project</li> <li>• Toyota Global Car-to-Car Recycle Project</li> </ul> <p><sup>2</sup> Dismantlers: Auto-dismantling businesses operators</p>
 <b>CHALLENGE 6</b> <b>Establishing a Future Society in Harmony with Nature</b>	<b>Connect nature conservation activities beyond the Toyota Group and its business partners among communities, with the world, to the future</b> <b>[ Activities ]</b> Enhance Toyota's long-standing nature conservation activities in the areas of nature fostering, environmental grants, and environmental education Develop three "connecting" projects started in 2016, sharing our know-how and environmental experiences <ul style="list-style-type: none"> <li>• Connecting communities: Toyota Green Wave Project</li> <li>• Connecting with the world: Toyota Today for Tomorrow Project</li> <li>• Connecting to the future: Toyota ESD<sup>3</sup> Project</li> </ul> <p><sup>3</sup> ESD: Education for Sustainable Development</p>

Results and Progress of Main Activities		Main Future Initiatives
Worldwide Common	Each Region	
<ul style="list-style-type: none"> <li>Achieved annual sales of more than 1.5 million electrified vehicles in 2017 with cumulative sales of 12 million vehicles (as of April 2018)</li> <li>Launched FCEV MIRAI</li> <li>Started feasibility study with Panasonic Corporation for joint automotive prismatic battery business</li> </ul>	<ul style="list-style-type: none"> <li>Launched FCEV bus, SORA (Japan)</li> <li>Concluded MOU with Suzuki Motor Corporation on EV introduction in India</li> <li>Collected data through trial runs of flexible fuel HEV prototypes using alcohol as fuel, including bio-ethanol, and verified the durability and powertrain performance toward commercialization (Brazil)</li> </ul>	<ul style="list-style-type: none"> <li>Make cumulative HEV sales of 15 million units in 2020</li> <li>Launch 10 or more BEV models worldwide by the early 2020s</li> <li>Make sales of 30,000 or more FCEV units per year worldwide by around 2020 and thereafter</li> <li>Launch dedicated electrified models or electrified options of all models by around 2025</li> <li>Expand TNGA powertrain models to approximately 80% of total Toyota vehicle sales units by 2023</li> </ul>
<ul style="list-style-type: none"> <li>Released TOYOTA Green Purchasing Guidelines published for Japan and overseas and requested suppliers to promote activities</li> <li>Participated in the Hydrogen Council, the world's first global initiatives with regard to hydrogen</li> </ul>	<ul style="list-style-type: none"> <li>Applied LCA to all models sold since 2004, and reduced CO<sub>2</sub> emissions (Japan)</li> <li>Reduced CO<sub>2</sub> emissions from logistics by joint transportation and optimization of the routes (India)</li> <li>Built "Tri-Gen," a fuel cell power generation plant together with a hydrogen station (U.S.)</li> <li>Started full-scale demonstration project using low-carbon hydrogen generated by wind power (Japan)</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen development and cooperation toward CO<sub>2</sub> emissions reduction with materials and parts suppliers</li> <li>Expand modal shift and joint transportation</li> </ul>
<ul style="list-style-type: none"> <li>Reduced CO<sub>2</sub> emissions by development and introduction of low-CO<sub>2</sub> technologies and daily <i>kaizen</i></li> <li>Promoted introduction of simplified and streamlined equipment along with changes in lines and processes</li> <li>Expanded overseas activities (in-house ESCO activities) to carry out energy diagnostics, <i>kaizen</i> proposals and countermeasure implementation (daily <i>kaizen</i> promotion)</li> <li>Introduced renewable energy</li> <li>Expanded introduction considering national and regional characteristics</li> </ul>	<ul style="list-style-type: none"> <li>Introduced new painting line that greatly reduces line volume and CO<sub>2</sub> emissions (Japan)</li> <li>Procured 100% renewable energy for electricity use (Brazil)</li> <li>Installed a zero-energy building using stationary pure hydrogen fuel cell technology (Japan)</li> </ul>	<ul style="list-style-type: none"> <li>Expand globally developed technologies to further reduce CO<sub>2</sub> emissions per unit produced</li> <li>Promote installation of in-house power generation facilities such as solar power generation at plants</li> <li>Promote <i>Tenouchika</i>* (Skill acquisition) and cost reduction for hydrogen-use technology</li> </ul> <p>* <i>Tenouchika</i> (Skill acquisition): Making use of technology and know-how</p>
<ul style="list-style-type: none"> <li>Established Toyota Water Environment Policy</li> <li>Water quantity: Evaluated our impact on the local water environment, and set challenge-focused plants</li> <li>Water quality: Evaluated the impact of plants that discharge water to rivers</li> </ul>	<ul style="list-style-type: none"> <li>Introduced water usage reduction and recycling technologies such as collecting rainwater to reduce the amount of industrial water usage, raising the water recycling rate through filtering, and recycling wastewater for reuse (France)</li> <li>Secured water required for car washing at dealers by introducing water purifying facilities equipped with water retention tanks and solar energy (South Africa)</li> </ul>	<ul style="list-style-type: none"> <li>Water quantity: Promote water usage reduction activities at challenge-focused plants</li> <li>Water quality: Conduct impact assessment</li> <li>Expand globally best practices of water usage reduction</li> </ul>
<ul style="list-style-type: none"> <li>Adopted continuously Easy-to-dismantle designs including pull-tab type ground terminals and Easy-to-dismantle marks</li> <li>Developed neodymium-reduced, heat-resistant magnet for use in motors that can reduce the amount of rare-earth neodymium by up to 50%</li> <li>Established HEV battery collection network</li> </ul>	<ul style="list-style-type: none"> <li>Launched a model facility for proper treatment of End-of-life vehicles first ever in Southeast Asia (Thailand)</li> <li>Organized courses for hydrogen gas extraction (Japan)</li> <li>Started establishment of large-capacity storage battery system and demonstration project to recycle used batteries in collaboration with Chubu Electric Power (Japan)</li> <li>Launched decentralized power generation system that combines used nickel-hydride batteries from Camry hybrid and solar power generation in Yellowstone National Park (U.S.)</li> </ul>	<ul style="list-style-type: none"> <li>Establish model facilities in regions with insufficient facilities for proper treatment of End-of-life vehicles</li> <li>Implement proper treatment of End-of-life electrified vehicles such as FCEVs and BEVs</li> <li>Establish global recycling systems for used batteries including overseas expansion of treatment furnaces</li> </ul>
<ul style="list-style-type: none"> <li>Expanded afforestation at plants in the Plant in Harmony with Nature project that continuously monitors indicator species in forest and other habitats</li> <li>Selected in Japan and overseas model plants set for "Plant in Harmony with Nature"</li> <li>Signed a Global Corporate Partnership agreement with WWF (World Wide Fund for Nature), a first for an automotive company</li> <li>Launched five-year partnership with International Union for Conservation of Nature (IUCN) in order to raise awareness of the biodiversity crisis and organized events in several countries</li> </ul>	<ul style="list-style-type: none"> <li>Started activities at model plants of "Plant in Harmony with Nature" in Japan</li> <li>Expanded activities, enhanced dissemination of information, and strengthened cooperation in the All-Toyota Harmony with Nature Working Group established by 23 affiliated companies (Japan)</li> <li>Implemented environmental hands-on learning programs at Toyota Shirakawa-Go Eco-Institute, the Forest of Toyota and the Toyota Mie Miyagawa Forest to foster personnel responsible for environmental conservation activities in the future (Japan)</li> <li>Launched All-Toyota Harmony with Nature Working Group overseas (Thailand)</li> </ul>	<ul style="list-style-type: none"> <li>Promote implementation of "Plant in Harmony with Nature" at model plants and <i>yokoten</i> to other plants</li> <li>"Connect communities" by expanding harmony with nature activities to conserve living creatures and their habitats in collaboration with local communities and companies</li> <li>"Connect with the world" through expansion of biodiversity conservation activities by means of partnerships with private companies, NGOs and other organizations</li> <li>"Connect to the future" by fostering environmentally conscious persons both in-house and outside</li> </ul>



Eiichiro Adachi

Counselor, The Japan Research  
Institute, Limited

### Review Commentary

Three years ago, when I learned Toyota set a target of reducing the environmental burden attributed to automobiles to as close to zero as possible under the Toyota Environmental Challenge 2050, I was confident that the level of corporate sustainability strategy in Japanese industries would steadily be advanced. Toyota overturned our common practice of discussing the future based on past accomplishments and setting goals based on the outlook for fulfillment, and I felt that this was an advanced concept of setting what the future should look like and positioning it as a starting point for considering what needs to be done. Nonetheless, there could still be a gap in employees' understanding between goals for 30 to 40 years ahead in the future, and targets in the

Toyota environmental action plan covering a five-year span. This 2030 Milestone now set will serve as an effective means of linking the present with the future and gaining the understanding of stakeholders. On the other hand, looking at the results and progress regarding the six challenges and action plans, there are some things that I would like to point out. First, it still needs a lot of work to grasp current conditions and manage progress at overseas sites. Considering the status of Toyota's global business development, it will not be possible to achieve the targets through the efforts of TMC alone. Second, there is room for collaboration among the different Challenge items. For example, by transforming the biotechnology and afforestation business into a forestry management business, a path to contributing to achievement of Challenge 2 may be possible. Third, additional priority should be placed on promoting eco-driving. Connected technology will make it possible at some point to assess the level of eco-driving by all drivers. Fourth is to actively commit to the use of clean energy. Companies that adopt RE100 are increasing in Japan and overseas. I understand well the difficulties of connecting the future with the present, but I expect that Toyota will continue to report periodically on its progress as a leading Japanese company.

### Review Commentary

Opportunities to learn are increasing as a result of the internet and social media, and schools are starting to teach students about ethical consumption and the SDGs, leading to changes in the consumption behavior of young people. When purchasing goods with the background of an ethical narrative, many people learn that they too can contribute to help establish an ethical society and feel a sense of pride and enrichment. When the generation with this kind of criteria becomes the core of the consumption society, considerate ways of using money will lead to the development of a society and natural environment where all people can live with peace of mind. Based on this type of ethical concept, the statement "to reduce the environmental burden of automobiles to as close to zero as possible and also to create positive impact on society" set forth in the Toyota Environmental Challenge 2050 is a message that can gain the empathy of consumers with an awareness of ethics. As I learned about Toyota's environment initiatives, I developed two expectations. Announcing the 2030 Milestone will lead to greater trust by consumers and society, but I would like to see more of this type of "selection criteria" conveyed in various forms so that we on the consumption side can fulfill our own responsibilities. Second, I would like Toyota to help encourage consumers to be ethical. I think that for global companies to gain even more support from consumers, it will be important for companies and brands to be taken as "gifts to local communities"—a positive gift in the sense that it is precisely because of Toyota's presence that local communities can thrive and numerous ethical consumers can be developed in the community. From time to time, I would like to see Toyota support action that enables consumers move forward together with companies, expanding the ethical world and leading to a sustainable society.

Rika Sueyoshi  
CEO, Ethical Association

As the automobile industry undergoes what is said to be a once-in-a-century transformation, Toyota will continue to innovate so it can provide safety and peace of mind, security, environmental sustainability, and *waku-doki* (excitement and exhilaration that wows you) to its customers. Particularly, with regard to the environment, we have been addressing climate change, water resources, recycling, biodiversity, and other issues under the Toyota Environmental Challenge 2050 since 2015. In this year's Environmental Report, we announced milestones, situations of each of the Challenges as of 2030 to make these measures even more concrete. When taking action going forward, we will deepen our measures in terms of activities, and the acquisition and disclosure of information, taking into account the four points indicated by Mr. Adachi. We also believe that, as pointed out by Ms. Sueyoshi, gaining the sympathy of customers and other stakeholders will be essential for realizing the challenges. We kindly request the continued support of all our stakeholders.







Hironori Kagohashi

Executive General Manager, Toyota Motor Corporation





## FY2018 Review of the Sixth Toyota Environmental Action Plan

Area	FY2018 Results Overview	
<b>Low Carbon</b> (Climate Change, CO <sub>2</sub> )		<b>Challenge 1 :</b> By improving environmental performance and expanding vehicle lineups, we reduced global average CO <sub>2</sub> emissions from new vehicles during operation by 13.7% compared to 2010. We achieved the 2020 sales target for next-generation vehicles (1.5 million units per year) ahead of original plan early by improving environmental performance and expanding the lineup of hybrid electric vehicles (HEVs). We also sold 50,000 Prius PHVs in 2017 and started selling the fuel cell electric vehicle (FCEV) bus, SORA. We established a new company with Mazda Motor Corporation and Denso Corporation for joint development of battery electric vehicles (BEVs) and began concrete collaboration.
		<b>Challenge 2 :</b> In the area of product development, we conducted life cycle assessment using Eco-VAS <sup>1</sup> of seven vehicle models sold in Japan. CO <sub>2</sub> emissions from the new Camry were cut by 19% compared to the previous model. In the area of logistics, we promoted activities to reduce CO <sub>2</sub> emissions with a focus on improving transportation efficiency. <sup>1</sup> Eco-VAS (Eco-Vehicle Assessment System): Comprehensive environmental impact assessment system throughout the entire vehicle development process based on the concept of life cycle assessment (LCA) from vehicle production and use to disposal stages. The aim of Eco-VAS is to serve as a valuable environmental management tool for chief engineers.
		<b>Challenge 3 :</b> To reduce CO <sub>2</sub> emissions in production, we achieved cumulative results through comprehensive daily <i>kaizen</i> . We expanded reduction effects globally through <i>yokoten</i> <sup>2</sup> of best practices and actively developed innovative technologies both in Japan and overseas aiming for further drastic reductions. We are introducing renewable energy on a large scale, and the number of introduction sites and the amount of electricity generated increased steadily. <sup>2</sup> <i>Yokoten</i> refers to sharing of improvement practices, know-how, non-compliance and other information within the All-Toyota Group
<b>Recycling</b> (Resources, Water)		<b>Challenge 4 :</b> To reduce water usage, we undertook proactive measures including introduction of reduction technologies at plants around the world and implementation of daily water-saving efforts. At water usage challenge-focused plants, we analyzed local water situations and other data, through the discussions with local communities. With regard to water quality, we took into consideration the impact of Toyota's water discharge on local water environment and selected challenge-focused plants.
		<b>Challenge 5 :</b> In the area of production, we continued daily measures to reduce waste such as reducing the volume of sludge. In logistics, we introduced simplified and returnable <sup>3</sup> packaging and wrapping materials, leading to a steady reduction in the amount of waste and the material used in packaging and wrapping. With regard to resource recycling, we deployed the "Waste oil, fluid, CFC/HFC proper Treatment Manual" on dismantling End-of-life vehicles overseas. We also completed responses to the law and regulation on proper treatment utilizing existing facilities in Vietnam, and, in Thailand, completed the launch of a model facility for proper treatment of End-of-life vehicles first ever in Southeast Asia. We continued the reuse and recycling of all recovered batteries and started its globalization in preparation for growing use of electrified vehicles in the future. <sup>3</sup> Returnable: To enable used packaging materials to be returned to original shipping points for reuse
<b>Harmony with Nature</b>		<b>Challenge 6 :</b> In the Toyota Green Wave Project, afforestation at plants as a part of sustainable plant activities was expanded to the Plant in Harmony with Nature Project, and activities at model plants in Japan started. The All-Toyota Harmony with Nature Working Group increased the number of activities by individual companies, raised employees awareness, and expanded Group-connecting activities. The Toyota Today for Tomorrow Project continued support for maintenance of the IUCN Red List of Threatened Species™ (IUCN <sup>4</sup> Red List) as well as steady ecosystem conservation efforts and measures for ensuring sustainable natural rubber production in Southeast Asia by WWF <sup>5</sup> , and a certain degree of progress was made. The Toyota ESD Project continued environmental education with a focus on children, who will become the leaders of tomorrow. The cumulative number of visitors to the Forest of Toyota reached 170,000 and the number of visitors to the Toyota Shirakawa-Go Eco-Institute reached 209,000. <sup>4</sup> IUCN (International Union for Conservation of Nature): Founded in 1948 through an international initiative, International Union for Conservation of Nature is a global nature conservation network comprising nations, government agencies, and non-governmental organizations <sup>5</sup> WWF: World Wide Fund for Nature
<b>Management</b>	<b>Environmental Management</b> Environmental non-compliance issues and complaints that occurred were minor incidents. In response to these incidents, we developed preventive countermeasures and implemented comprehensive <i>yokoten</i> of these measures. We started to commend suppliers that made significant contributions. In the sales and service fields, we promoted the formulation of regional environmental guidelines and their deployment to distributors and dealers. We worked to improve information disclosures, and the Environmental Report 2017 received the Excellent Environmental Report Prize of the 21st Environmental Communication Awards.	



## FY2018 Review of the Sixth Toyota Environmental Action Plan (Details)

: Steady progress toward FY2021 target  
 : Issues exist, but FY2021 target is expected to be met  
 : FY2021 target is not expected to be met

	Action Items	Specific Actions and Goals	FY2018 Results	Evaluation	Page																														
Low Carbon (Climate Change, CO <sub>2</sub> )	(1) New Vehicle Zero CO <sub>2</sub> Emissions Challenge																																		
	1. Develop technologies to achieve the best fuel efficiency performance	●Reduce rate in average CO <sub>2</sub> emissions from new vehicles globally by over 22% from 2010 global level as of 2020 – Develop high-performance powertrain through TNGA and introduce it in steps – Achieve further high-performance development of HEVs and expand their deployment	●Reduced 13.7% in global average CO <sub>2</sub> emissions from new vehicles (Japan, United States, Europe, and China) in 2017 compared to 2010 Promoted initiatives toward meeting our 2020 goal by developing low-CO <sub>2</sub> -emitting engines and transmissions through TNGA, making further improvements in the environmental performance of HEVs, and expanding the product lineup	✓✓	21																														
	2. Promote development of next-generation vehicles using electric power and widespread adoption according to their features	●HEV : Promote higher performance and expand the lineup to broaden consumer adoption of HEVs, aim to reach annual HEV sales of 1.5 million units and cumulative sales of 15 million units by 2020 ●PHEV : Establish PHEV as core electrified vehicle in support of fuel diversification and develop higher-performance PHEVs and promote widespread adoption ●BEV : Promote technology development for short-distance purposes in combination with low-carbon traffic systems ●FCEV : Promote activities to further reduce cost, achieve greater compactness and durability, and strengthen product appeal toward effective use of hydrogen as an important future energy source	Accelerated development with a target of selling at least 5.5 million electrified vehicles per year (including at least 1 million BEVs and FCEVs) by 2030 (Every model will be available either as dedicated electrified model or have electric option by around 2025) ●HEV : Achieved the sales target for 2020 (1.5 million units/year) early by making further improvements in environmental performance and expanding the product lineup (in FY2018, the new JPN TAXI HEV was released in Japan) HEVs accounted for 40% of Toyota vehicles sold in Japan and 16% overseas ●PHEV : Sales of the new Prius PHV, which boasts greatly improved marketability, were approximately 50,000 units in 2017, and we are making steady efforts to promote widespread adoption ●FCEV : Launched new FCEV bus, "SORA," a mass-sales model We aim to sell at least 100 units, mainly in Tokyo, by 2020 ●BEV : Established a new company with Mazda Motor Corporation and Denso Corporation for joint development of BEVs and began concrete collaboration	✓✓	20																														
	(2) Life Cycle Zero CO <sub>2</sub> Emissions Challenge																																		
	3. Promote environmental management for product development (Eco-VAS)	●Steadily promote environmental target management using vehicle environmental assessment (Eco-VAS) at the development stage – Reduce life cycle environmental impact or both fully redesigned models and new models compared with previous models – Disclose assessment results properly to customers on website and in product catalogues	●Conducted life cycle assessment using Eco-VAS of seven vehicle models including redesigned and new models in Japan Life cycle CO <sub>2</sub> emissions of all assessed models were reduced compared to their reference vehicles. (CO <sub>2</sub> emissions from the new Camry were cut by 19% compared to the 2011 model)	✓✓	24																														
	4. Study practical use development of catalyst technology-based CO <sub>2</sub> absorption and new material creation (artificial photosynthesis, etc.)	●Develop artificial photosynthesis technologies from CO <sub>2</sub> , water, and solar power – Complete basic verification tests for creation of primary CO <sub>2</sub> -absorbing material (material or fuel) using the world's most efficient photosynthetic unit in 2020	●Realized a formic acid synthesis reaction from just CO <sub>2</sub> , water, and solar energy using a light absorbent material and catalyst by making use of abundant iron rust (iron oxide)	✓✓	—																														
	5. Raise transportation efficiency and reduce CO <sub>2</sub> emissions in logistics activities	●Promote CO <sub>2</sub> reduction activities by further improving transportation efficiency (take comprehensive measures to reduce total distance travelled and promote further modal shift) <table><tr><td>Region</td><td>Item</td><td>Base year</td><td>Target (FY2021)</td></tr><tr><td rowspan="2">Japan</td><td>Total emissions</td><td>FY1991</td><td>25% reduction</td></tr><tr><td>Emissions per transportation volume</td><td>FY2007</td><td>14% reduction (1% reduction)</td></tr><tr><td>Overseas</td><td colspan="3">Measured performance</td></tr></table>	Region	Item	Base year	Target (FY2021)	Japan	Total emissions	FY1991	25% reduction	Emissions per transportation volume	FY2007	14% reduction (1% reduction)	Overseas	Measured performance			●Achieved the goal by promoting <i>kaizen</i> activities <table><tr><td>Region</td><td>Item</td><td>Base year</td><td>FY2018 results</td></tr><tr><td rowspan="2">Japan</td><td>Total emissions</td><td>FY1991</td><td>35% reduction</td></tr><tr><td>Emissions per transportation volume</td><td>FY2007</td><td>20% reduction</td></tr><tr><td>Overseas</td><td colspan="3">Measured performance</td></tr></table>	Region	Item	Base year	FY2018 results	Japan	Total emissions	FY1991	35% reduction	Emissions per transportation volume	FY2007	20% reduction	Overseas	Measured performance			✓✓	25
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Overseas	Measured performance																																		
6. Contribute to local communities through the expansion of local grid energy management technologies	●Establish micro-grid (F-grid) and regional optimal energy management technology and promote domestic and overseas rollout – Verify the tests in Ohira-mura project in Tohoku and Motomachi Plant project in Toyota City – Deploy technologies at other plants in Japan and countries in Asia, etc.	●Promoted all projects as planned – Micro-grid (F-grid): 24% energy saving and 31% CO <sub>2</sub> reduction after F-grid introduction – Motomachi Plant, Toyota City: Practical application of chemical thermal storage technology through NEDO verification tests in progress – Other plants in Japan, Asia: Continued the collection of information (on conditions for installation, laws and regulations, etc.)	✓✓	—																															
7. Promote an integrated approach to reduce CO <sub>2</sub> emissions in road traffic sectors	●Contribute to realization of smart mobility society through IT and ITS technologies – Based on the verification tests results of next-generation transportation system Ha:mo in Japan and France, which we use ultra-compact BEVs, aim to deploy technologies in other regions and establish business models, considering the Olympic Games Tokyo 2020 and Paralympic Games	●In Toyota City and Okinawa, shifted to commercialization by local operating companies Implemented improvement of profitability and systems, and functional development in Tokyo and Okayama under demonstration phase toward building sustainable business operation models	✓✓	—																															

	Action Items	Specific Actions and Goals	FY2018 Results	Evaluation	Page																						
Low Carbon (Climate Change, CO <sub>2</sub> )	(2) Life Cycle Zero CO <sub>2</sub> Emissions Challenge																										
	7. Promote an integrated approach to reduce CO <sub>2</sub> emissions in road traffic sectors	●Actively participate in integrated traffic flow improvement project for establishment of a low-carbon mobility society – Establish WBCSD/SMP 2.0 Sathorn Model and formulate roadmap for Bangkok rollout	●In February 2017, the Thai National Transport Policy Board (chaired by Deputy Prime Minister Somkid Jatusriptak) approved a roadmap for implementation of the Sathorn model in Bangkok, and the result was reported to the Council of Ministers (Prime Minister Prayut Chan-o-cha) in April.	✓✓	—																						
		●Promote adoption of eco-driving globally – Promote eco-driving globally among customers and employees	●Took the following initiatives: – Continued to promote customer education activities, such as eco-driving advice through dealers and eco-driving support through rental & leasing shops – Raised employees awareness regarding eco-driving by displaying posters that use animals to convey a strong message, distributing pamphlets, and holding internal lectures presented by outside speakers	✓✓																							
	(3) Plant Zero CO <sub>2</sub> Emissions Challenge																										
8. Reduce CO <sub>2</sub> emissions in production activities	●Promote activities to reduce CO <sub>2</sub> emissions through the development and deployment of low-CO <sub>2</sub> production technologies and daily <i>kaizen</i> – Pursue further productivity and include offices and other sites in rollout of activities ●Utilize clean energies in accordance with the particular conditions of each country and region – Promote introduction in stages toward FY2021 ●Manage greenhouse gases (GHG) emissions from sources other than energy sources	●Promoted technological development and steadily introduced developed technologies toward achieving the FY2021 goals ●Accelerated shop-oriented daily <i>kaizen</i> activities for each process ●Promoted the introduction of renewable energy	✓✓	28																							
Recycling (Resources, Water)	(4) Challenge of Minimizing and Optimizing Water Usage																										
	9. Reduce water usage in production activities	●Promote continual activities to reduce water usage in consideration of water environment in each country and region – Introduce innovative initiatives linked with planning of new plants and production line reforms – Reduce water usage through daily <i>kaizen</i> and other activities	●Promoted introduction of water usage reduction technologies as well as daily water conservation activities in domestic and overseas plants	✓✓	35																						
		<table><tr><th>Region</th><th>Item</th><th>Base year</th><th>Target (FY2021)</th></tr><tr><td rowspan="3">TMC (vehicle plants)</td><td>Usage per vehicle</td><td>FY2002</td><td>12% reduction</td></tr><tr><td colspan="3">Promote regional No. 1 reduction activities</td></tr></table>	Region	Item		Base year	Target (FY2021)	TMC (vehicle plants)	Usage per vehicle	FY2002	12% reduction	Promote regional No. 1 reduction activities			<table><tr><th>Region</th><th>Item</th><th>Base year</th><th>FY2018 results</th></tr><tr><td>TMC (vehicle plants)</td><td>Usage per vehicle</td><td>FY2002</td><td>26% reduction</td></tr><tr><td>Overseas</td><td colspan="3">Implemented reduction activities that match local situations</td></tr></table>	Region	Item	Base year	FY2018 results	TMC (vehicle plants)	Usage per vehicle	FY2002	26% reduction	Overseas	Implemented reduction activities that match local situations		
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(5) Challenge of Establishing a Recycling-based Society and Systems																											
10. Reduce consumption of dwindling natural resources through use of renewable resources and recycled materials	●Reduce the use of petroleum-derived Plastics – Develop technology for recycled plastics and eco-plastics meeting quality and performance requirements – Establish collection systems for used plastics ●Promote reuse of rare resources and use of recycled materials – Develop CFRP recycling technologies – Develop technologies for recycling and reducing use of rare earth materials	●Petroleum-derived plastics – Continued trials in collaboration with dismantling companies to collect plastic from End-of-life vehicles, investigated efficient means of removing foreign materials, and took measures to develop materials that can be reused in vehicles. – Continued to collect and recycle End-of-life bumpers generated through repair work at Toyota dealers ●Promoted reuse of rare resources and use of recycled materials – Continued to develop technologies for recycling CFRP materials – Continued to work on reducing the amount of rare earth metals used in hybrid components	✓✓	38																							
11. Achieve industry-leading levels in easy-to-dismantle design for effective resource recycling	●Maintain and improve industry-leading levels for easy-to-dismantle design – Integrate reliable easy-to-dismantle designs into all models including next-generation vehicles (BEV, FCEV) and smart mobility vehicles – Develop and integrate easy-to-dismantle designs into new technologies and new materials parts	●Continued to apply easy-to-dismantle designs to newly developed vehicles such as the JPN TAXI, Prius PHV, Camry, and Lexus LS	✓✓	40																							
12. Contribute worldwide through End-of-life vehicle treatment and recycling technology developed in Japan	●Deploy proper End-of-life vehicles treatment technology overseas in accordance with conditions in each country and region – Conduct proper End-of-life vehicle treatment in accordance with local End-of-life recycling laws, while enhance initiatives in countries and regions where laws are expected to be introduced, based on the guidance – Establish 100 of proper End-of-life vehicle treatment facilities (seven sites by 2020)	●Took the following initiatives: – Created the “Waste oil, fluid, CFC/HFC proper Treatment Manual (Basic Edition)” on dismantling End-of-life vehicles, assuming countries and regions without sufficient dismantling facilities and equipment and deployed it overseas – Completed responses to law and regulation in proper treatment of End-of-life vehicles utilizing existing facilities (Vietnam) – Installed a model facility for proper treatment of End-of-life vehicles first ever in Southeast Asia (Thailand)	✓✓	41																							

	Action Items	Specific Actions and Goals	FY2018 Results	Evaluation	Page																																																								
Recycling (Resources, Water)	(5) Challenge of Establishing a Recycling-based Society and Systems																																																												
	13. Expand original recycling systems for End-of-life vehicles worldwide	<ul style="list-style-type: none"><li>•Promote advanced development of Toyota's original recycling technologies and provide support overseas Japan<ul style="list-style-type: none"><li>– Enhance technologies for remanufacturing and recycling nickel-metal-hydrate batteries (lowering cost) and provide support overseas</li><li>– Establish technologies for remanufacturing and recycling lithium-ion batteries and provide support overseas</li><li>– Practical use of recycling wiring harnesses in Japan (expand scale of operations)</li><li>– Practical use of recycling magnets in Japan (expand scale of operations)</li><li>– Develop power generation and storage systems using HEV units</li><li>– Study and set goals for bumper collection and recycling technologies in major regions overseas</li></ul></li></ul>	<ul style="list-style-type: none"><li>•Took the following initiatives:<ul style="list-style-type: none"><li>– Since FY1997, collected a total of 98,700 batteries from End-of-life vehicles for total reuse and recycling</li><li>– Started measures to globalize battery recycling in preparation for the expanded use of electrified vehicles around the world in the future</li><li>– Continued to promote remanufacturing (examination and re-assembly) and reuse of batteries, including application of stationary storage batteries</li><li>– Continued to extract rare earths from magnets collected from the market for recycling and reuse as magnetic materials and so on; since FY2013, collected and recycled a cumulative 35 tons of magnets</li><li>– Teamed up with an electric power company to investigate large-capacity storage batteries</li></ul></li></ul>	✓✓	42																																																								
	14. Reduce waste and use resources efficiently in production activities	<ul style="list-style-type: none"><li>•Promote activities to reduce waste through development and deployment of waste reduction-oriented production technologies and daily <i>kaizen</i><ul style="list-style-type: none"><li>– Promote waste reduction and efficient use of resources through improving yields and other source-oriented measures</li><li>– Promote activities to reduce resources loss by reducing amounts of valuables and waste generated</li></ul></li><li>•Promote activities to reduce metal scrap generation and implement All-Toyota campaigns to effectively use resources internally</li></ul> <table><tr><th>Scope</th><th>Region</th><th>Item</th><th>Base year</th><th>Target (FY2021)</th></tr><tr><td rowspan="5">Waste</td><td>Valuables</td><td>Japan<sup>2</sup></td><td>Volume generated</td><td>Promote activities to reduce metal scrap generation and implement All-Toyota campaigns to effectively use resources internally</td></tr><tr><td rowspan="3">Waste<sup>1</sup></td><td>Japan</td><td>Waste volume generated per vehicle</td><td>FY2002</td><td>35% reduction</td></tr><tr><td>TMC</td><td>Waste volume generated per vehicle</td><td>FY2002</td><td>63% reduction</td></tr><tr><td colspan="4">Zero landfill waste<sup>3</sup></td></tr><tr><td>Overseas</td><td colspan="4">No. 1 regionally in reduction promotion</td></tr></table> <p><sup>1</sup> Waste at cost, incinerated waste, landfill waste <sup>2</sup> TMC + worldwide consolidated subsidiaries (manufacturing) <sup>3</sup> Zero means direct landfill waste equal to 1% or less the amount generated in FY1995</p>	Scope	Region		Item	Base year	Target (FY2021)	Waste	Valuables	Japan <sup>2</sup>	Volume generated	Promote activities to reduce metal scrap generation and implement All-Toyota campaigns to effectively use resources internally	Waste <sup>1</sup>	Japan	Waste volume generated per vehicle	FY2002	35% reduction	TMC	Waste volume generated per vehicle	FY2002	63% reduction	Zero landfill waste <sup>3</sup>				Overseas	No. 1 regionally in reduction promotion				<ul style="list-style-type: none"><li>•Continued to reduce the dust from casting processes and reduced the volume of sludge by increasing the recycling rate</li></ul> <table><tr><th>Scope</th><th>Region</th><th>Item</th><th>Base year</th><th>FY2018 results</th></tr><tr><td rowspan="5">Waste</td><td>Valuables</td><td>Japan</td><td>Volume generated</td><td>Promoted yield improvement and reliably collect scrap materials</td></tr><tr><td rowspan="3">Waste</td><td>Japan</td><td>Waste volume generated per vehicle</td><td>FY2002</td><td>31% reduction</td></tr><tr><td>TMC</td><td>Waste volume generated per vehicle</td><td>FY2002</td><td>62% reduction</td></tr><tr><td colspan="4">Zero landfill waste</td></tr><tr><td>Overseas</td><td colspan="4">Promoted various activities, such as reuse</td></tr></table>	Scope	Region	Item	Base year	FY2018 results	Waste	Valuables	Japan	Volume generated	Promoted yield improvement and reliably collect scrap materials	Waste	Japan	Waste volume generated per vehicle	FY2002	31% reduction	TMC	Waste volume generated per vehicle	FY2002	62% reduction	Zero landfill waste				Overseas	Promoted various activities, such as reuse				✓✓
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15. Reduce packaging and wrapping materials and using resources efficiently in logistics activities	<ul style="list-style-type: none"><li>•Promote <i>kaizen</i> with a focus on increasing use of returnable containers and reducing the amount of wrapping material (Japan) Continue <i>kaizen</i> at conventional level (down 14% from FY2007) (Overseas) Assess best practices</li></ul>	<ul style="list-style-type: none"><li>•Promoted simplified and returnable wrapping materials (Japan) Continued <i>kaizen</i> as in the past (35% reduction from FY2007) (Overseas) Assessed <i>kaizen</i> best practices</li></ul>	✓✓	43																																																									
Harmony with Nature	(6) Challenge of Establishing a Future Society in Harmony with Nature																																																												
	16. Promote nature conservation activity "Connecting regional conservation activities with region and community"	<ul style="list-style-type: none"><li>•Toyota Green Wave Project—an initiative to connect with local communities through the various activities undertaken by all Toyota companies and their global affiliates to preserve the natural environment<ul style="list-style-type: none"><li>– Continue the currently sustainable plant activity and simultaneously expand the various activities of all Toyota Group companies to overseas subsidiaries, affiliates and local communities and expand the reach of activities in partnership with stakeholders</li></ul></li></ul>	<ul style="list-style-type: none"><li>•Continued activities by All-Toyota Harmony with Nature Working Groups (WG) at group and other companies (23 companies) (Connecting activities)<ul style="list-style-type: none"><li>– Expanded harmony-with-nature activities by carrying out a total of 217 activities (84% increase from the previous year) at all Toyota companies in Japan</li><li>– Held a joint event twice annually to strengthen group collaboration (May 2017: tree-planting festival; October 2017: riverside bamboo forest maintenance)</li></ul></li><li>(Enhancement of awareness)<ul style="list-style-type: none"><li>– Distributed volume 2 of the Green Wave Project activities booklet to employees in Working Group companies and posted on the company website in June 2017 to steadily raise internal awareness of biodiversity and the activities of each company</li><li>– Launched a website for public in June 2018 in order to raise awareness further</li></ul></li><li>•Commenced "Plant in Harmony with Nature" activities<ul style="list-style-type: none"><li>– Applied the knowledge obtained through biodiversity conservation activities from the new Toyota R&amp;D Center project to each plant implementing sustainable plant project activities, in order to improve the level of harmony-with-nature activities</li><li>– Commenced its activities by developing new biotope and trial survey of indicator species conducted by employees at the model plant in Japan (Tsutsumi Plant)</li><li>– Expanded activities at the model plant in Japan to other domestic and overseas plants</li></ul></li></ul>	✓✓	44																																																								
	17. Boost nature and biodiversity conservation grants to connect environmental activities to the world	<ul style="list-style-type: none"><li>•Connect environmental and biodiversity conservation activities to the world through grants for those activities<ul style="list-style-type: none"><li>– Toyota Today for Tomorrow Project –</li><li>– Strengthen grants for projects helping to solve environmental issues as a means to prioritize the environment field among social contribution activities</li></ul></li><li>Collaborate with global organizations and stakeholders to provide new value and extend the circle of activities globally</li></ul>	<ul style="list-style-type: none"><li>•Built cooperative relationships with international organizations and NGOs as described below and received positive feedback, in particular from government officials, experts, and NGOs<ul style="list-style-type: none"><li>– Conducted the following two events in collaboration with IUCN<ul style="list-style-type: none"><li>Event to raise awareness of biodiversity in Asia (May, Bangkok)</li><li>Red List Project progress report press conference (December, Tokyo)</li></ul></li><li>– As a part of its support for the Red List Project, donated vehicles to BirdLife International and Conservation International. Presentation ceremonies were held in March in Vietnam and Indonesia.</li><li>– Seminar on natural rubber held as a part of the WWF Living Asian Forest Project (July, Tokyo)</li></ul></li><li>Also, social media was used to disseminate images of animals and plants that live in Living Asian Forests and scenes of activities</li><li>•In addition to collaborating with the major NGOs above, continued the Toyota Environmental Activities Grant Program to support small- and medium-size NGOs and NPOs</li></ul>	✓✓	47																																																								

	Action Items	Specific Actions and Goals	FY2018 Results	Evaluation	Page
Harmony with Nature	(6) Challenge of Establishing a Future Society in Harmony with Nature				
	18. Boost contribution to environmental education "Connecting environmental activities to the future"	●Toyota ESD Project—an initiative to strengthen environmental education using regional business bases and company property, and thereby connect environmental conservation activities to the future —Toyota ESD Project— – Globally expand education of local residents and children using forests and green biotopes at plants, and so on – Promote development of educational programs taking advantage of the special characteristics of company-owned land (The Toyota Shirakawa-Go Eco-Institute, Forest of Toyota, Miyagawa Forest in Mie Prefecture, etc.) and promote human resources development to connect to the future	●Took the following initiatives: (Employee education) – Same as No. 25 (Forest of Toyota) – Held hands-on nature programs for local elementary school children (6,054 children in FY2018) – The cumulative number of visitors reached 170,000 as of March 31, 2018 – Conducted lectures on development of wetland environments for dragonfly preservation and considering how people can live in harmony with them (Toyota Shirakawa-Go Eco-Institute) – The number of visitors who stayed at the Institute in FY2018 reached 16,718 The cumulative number of visitors reached 209,000 as of March 31, 2018 – Strengthened programs for nurturing children for the future, held eight different children's camps including a new camp for junior high school students with 353 children participating (45% increase from 243 children of the previous fiscal year) (TOYOTA Mie Miyagawa Mountain Forest) – With a local NPO, conducted a course on the roles of forest management for limpid streams and the inhabiting species (New Toyota R&D Center) – Conducted a rice paddy living creature survey and charcoal making experience event for employees as an environmental education program	✓✓	49
	19. Promote environmental contributions through biotechnology and afforestation business automotive peripheral technologies, and forest conservation activities	●Respond to environmental issues with bio technology – Promote cellulose ethanol development by further improvement of yeast ferment capacity – Contribute natural capital creation by applying to farming biomass business and agriculture area  ●Contribute to "Adaptation" in climate change through urban greening business and group owned technology – Respond to heat island (dissemination of wall greening; high efficient shading paint)	●Initiatives in biomass and agriculture fields – Conducted verification tests at overseas cellulosic ethanol pilot plants – Expanded market acceptance of the resQ45 series, a manure composting and deodorizing material for the livestock industry* – Provided Housaku Keikaku (an agricultural IT management tool and site improvement tool) to more than 50 agricultural corporations Concluded cooperative agreements with multiple local governments including Nagano Prefecture – Concluded licensing agreement for Toyota's proprietary GRAS-Di® DNA analysis technology, which dramatically accelerates selective varieties ●Promoted urban greening initiatives – Promoted market acceptance of Smart Green Parking (SGP), a special urban greening material, and TM9, a low-management turf grass* * Sold by Toyota Roof Garden, a consolidated subsidiary	✓✓	50
		●Establish a model to use resources effectively in Forestry in Miyagawa, Mie Prefecture  ●Realize a sustainable technical center in harmony with nature and local communities at the new research and development facility currently in the planning stage	●Toyota Mie Miyagawa Mountain Forest – Developed educational programs using wood products and conduct the programs at Toyota facilities (Toyota Automobile Museum, MEGA Web, etc.) – Used local lumber products at Toyota facilities ●New Toyota R&D Center – Continued steady environmental conservation activities and surveys at the development site and reported the results to the Environment Monitoring Committee (twice annually) – Worked with experts to continue activities to conserve wild birds, which are declining in number in the Mikawa District Confirmed successful breeding of owls, as well as oriental dollarbirds, very few of which had successfully bred in the region, in the nest boxes that had been installed – Publicized the knowledge obtained through conservation activities in environmental reports (four times) and an academic society meeting (one time)	✓✓	
Management	Environmental Management				
	20. Strengthen consolidated environmental management	●Enhance activities of various environmental committees to improve environmental management activities and ensure superior environmental performance (CO <sub>2</sub> , water, etc.) across all business activities in countries and regions around the world	●Took the following initiatives: – Regularly held the (annual) All-Toyota Production Environment Conference and Liaison Committee (Board of Directors meeting) – Held an environmental global award ceremony (to promote <i>kaizen</i> activities at overseas affiliates) – Held the Sixth Toyota Global Environment Conference in November 2017 and discussed the Toyota Environmental Challenge 2050 and others with managers from various regions	✓✓	54
		●Thoroughly comply with environmental laws and regulations and strengthen proactive prevention measures for environmental risks ●Improve chemical substance management by carefully monitoring legal trends in each country and region	●Took the following initiatives: – Held seminars targeting those responsible for environmental initiatives at Toyota Group companies in Japan – Seven instances of environmental non-compliance (1 at TMC, 3 in Japan, and 3 overseas) All were minor non-compliance issues and complaints, and corrective measures and <i>yokoten</i> to other departments were completed	✓	
		●Improve chemical substance management by carefully monitoring legal trends in each country and region	●Deployed chemical substance management globally – Complied with Toyota standards – Ensured entry of chemical substance data into the IMDS – Audited and investigated suppliers' processes and evaluated and improved chemical substance management systems	✓✓	

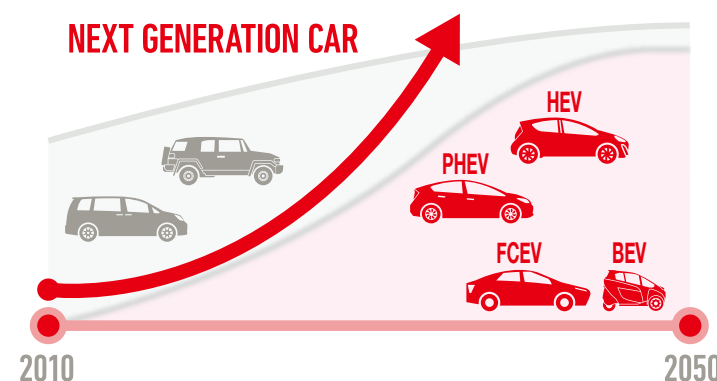
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Management	Environmental Management																																																
	21. Reduce vehicle exhaust emissions to improve urban air quality in each country and region	<ul style="list-style-type: none"><li>Steadily introduce low-emissions vehicles to improve urban air quality in each country and region</li><li>Contribute to air quality improvement through air quality research in collaboration with research organizations in each country</li></ul>	<ul style="list-style-type: none"><li>In response to stricter emissions regulations intended to improve the urban environment in various countries and regions, steadily introduced vehicles that satisfy those regulations</li></ul>	✓✓	55																																												
	22. Reduce VOC emissions in production activities	<ul style="list-style-type: none"><li>Develop and deploy VOC emissions reduction technologies through reduced usage of paint and thinners in painting processes<ul style="list-style-type: none"><li>Promote continual reduction in VOC emissions through initiatives linked to painting equipment upgrade plans as well as daily <i>kaizen</i></li></ul></li></ul> <table><thead><tr><th>Scope</th><th>Region</th><th>Item</th><th>Target (FY2021)</th></tr></thead><tbody><tr><td rowspan="3">Vehicle body painting</td><td>Japan*</td><td>Emissions volume per area painted</td><td>26 g/m<sup>2</sup> or less (average for all lines)</td></tr><tr><td>TMC</td><td>Emissions volume per area painted</td><td>19 g/m<sup>2</sup> or less (average for all lines)</td></tr><tr><td>Overseas</td><td colspan="2">Promote regional No. 1 reduction activities</td></tr><tr><td>Bumper painting</td><td>TMC</td><td>Emissions volume per area painted</td><td>310 g/m<sup>2</sup> or less (average for all lines)</td></tr><tr><td>Other painting</td><td>Japan/overseas</td><td colspan="2">Promote VOC emissions reduction activities</td></tr></tbody></table> <p>* TMC + consolidated subsidiaries in Japan (manufacturing)</p>	Scope	Region	Item	Target (FY2021)	Vehicle body painting	Japan*	Emissions volume per area painted	26 g/m <sup>2</sup> or less (average for all lines)	TMC	Emissions volume per area painted	19 g/m <sup>2</sup> or less (average for all lines)	Overseas	Promote regional No. 1 reduction activities		Bumper painting	TMC	Emissions volume per area painted	310 g/m <sup>2</sup> or less (average for all lines)	Other painting	Japan/overseas	Promote VOC emissions reduction activities		<ul style="list-style-type: none"><li>Continued efforts to limit the use of cleaning solvents and to increase the percentage of solvent recovery</li><li>Promoted switching bumper-painting processes to water-borne paints in conjunction with facility remodeling</li></ul> <table><thead><tr><th>Scope</th><th>Region</th><th>Item</th><th>FY2018 results</th></tr></thead><tbody><tr><td rowspan="3">Vehicle body painting</td><td>Japan</td><td>Emissions volume per area painted</td><td>21.5 g/m<sup>2</sup></td></tr><tr><td>TMC</td><td>Emissions volume per area painted</td><td>14.4 g/m<sup>2</sup></td></tr><tr><td>Overseas</td><td colspan="2">Promoted coating efficiency improvement and other activities</td></tr><tr><td>Bumper painting</td><td>TMC</td><td>Emissions volume per area painted</td><td>176 g/m<sup>2</sup></td></tr><tr><td>Other painting</td><td>Japan/overseas</td><td colspan="2">Promoted painting condition optimization, and so on</td></tr></tbody></table>	Scope	Region	Item	FY2018 results	Vehicle body painting	Japan	Emissions volume per area painted	21.5 g/m <sup>2</sup>	TMC	Emissions volume per area painted	14.4 g/m <sup>2</sup>	Overseas	Promoted coating efficiency improvement and other activities		Bumper painting	TMC	Emissions volume per area painted	176 g/m <sup>2</sup>	Other painting	Japan/overseas	Promoted painting condition optimization, and so on		✓✓	56
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23. Promote environmental activities in cooperation with business partners (suppliers)	<ul style="list-style-type: none"><li>Reinforce cooperation with suppliers to further promote environmental activities globally<ul style="list-style-type: none"><li>Ensure compliance with each country's laws and regulations while steadily promoting chemical substance management</li><li>Pursue cooperative environmental initiatives in a broad range of areas, including CO<sub>2</sub> emissions reduction, resource recycling, water impact reductions, and the establishment of societies in harmony with nature</li></ul></li></ul>	<ul style="list-style-type: none"><li>Took the following initiatives:<ul style="list-style-type: none"><li>Requested implementation of activities (at 36 affiliates in 15 countries) based on the revised TOYOTA Green Purchasing Guidelines (January 2016)</li><li>Requested suppliers in Japan to conduct self-assessments in order to ensure thorough chemical substances management, and carried out activities to enhance future initiatives</li><li>Conducted similar activities at major overseas sites</li><li>Continued to implement the CDP Supply Chain Program (to address climate change and the water environment)</li><li>Conducted various joint studies with suppliers through various study groups and discussions</li><li>Implemented company-wide environmental initiatives throughout the supply chain and commenced commendation of suppliers that made substantial contributions</li></ul></li></ul>	✓✓	57																																													
24. Promote environmental activities in cooperation with business partners (dealers and distributors)	<ul style="list-style-type: none"><li>Promote environmental management in cooperation with dealers and distributors (Japan)<ul style="list-style-type: none"><li>Promote environmental initiatives by adhering closely to the Toyota Dealer CSR Checklist and promote CO<sub>2</sub> emissions reduction, etc., by improving environmental management</li></ul></li><li>(Overseas)<ul style="list-style-type: none"><li>Promote and strengthen environmental initiatives led by each regional headquarters and distributor in each country (CO<sub>2</sub> reduction, etc.)</li><li>Promote and strengthen Dealer Environmental Risk Audit Program (DERAP)</li></ul></li></ul>	<ul style="list-style-type: none"><li>Took the following initiatives:<ul style="list-style-type: none"><li>(Japan)<ul style="list-style-type: none"><li>Promoted environmental initiatives by updating the content of the Toyota Dealer CSR Checklist, and promoted CO<sub>2</sub> emissions reduction and others by using external environmental certification systems and improving environmental management</li></ul></li><li>(Overseas)<ul style="list-style-type: none"><li>Currently creating environmental guidelines for the sales and services fields in each region</li><li>Promoted and strengthened environmental initiatives (CO<sub>2</sub> emissions reduction, etc.)</li></ul></li><li>92 distributors and 4,296 dealers from 89 countries worldwide participated in the Dealer Environmental Risk Audit Program (DERAP), and 95% of participating dealers satisfied the five requirements (up 4% from the previous fiscal year)</li></ul></li></ul>	✓✓	58																																													
25. Bolster global employee education and awareness activities	<ul style="list-style-type: none"><li>Raise awareness of environmental conservation through global environmental education among employees<ul style="list-style-type: none"><li>Systemize environmental education programs conducted in cooperation with consolidated affiliates</li><li>Conduct environmental education in accordance with situations in each country and region</li></ul></li></ul>	<ul style="list-style-type: none"><li>Took the following initiatives:<ul style="list-style-type: none"><li>During Toyota Global Environment Month, which was first introduced in 1973, conducted environmental education for employees around the world</li><li>At TMC, used internal digital signage and PC screens, loaned environmental films, subsidized eco-test fees, and took other measures to raise employees awareness of the environment</li><li>Continued environmental lectures conducted by outside speakers, environmental seminars for employees, and environmental education for new employees</li><li>Developed an internal environmental education plan in line with the Sixth Toyota Environmental Action Plan in each country and region</li></ul></li></ul>	✓✓																																														
26. Enhance active disclosure of environmental information and communication	<ul style="list-style-type: none"><li>Enhance environmental information disclosures<ul style="list-style-type: none"><li>Expand business organizations subject to collection of environmental information, and creation of the system</li><li>Further enhance "Environmental Report" contents</li></ul></li><li>Further enhance environmental communications activities in each country and region globally</li></ul>	<ul style="list-style-type: none"><li>Took the following initiatives:<ul style="list-style-type: none"><li>Based on 2016 three-year plan for enhancing environmental information disclosure approved by the Production Environment Committee, continued development of a mechanism for collecting and verifying newly disclosed information</li><li>Effectively described the status of progress in line with the Toyota Environmental Challenge 2050 and the Sixth Toyota Environmental Action Plan in the Environmental Report 2017</li><li>Received the Excellent Environmental Report Prize of the 21st Environmental Communication Awards</li><li>Continued to produce and publicly release videos effectively spotlighting employees who are striving to carry out the Toyota Environmental Challenge 2050</li><li>TMNA produced and publicly released videos which contents are linked with its North America Environmental Report</li></ul></li></ul>	✓✓	59																																													

## Challenge 1 New Vehicle Zero CO<sub>2</sub> Emissions Challenge

**Fundamental Approach** Extreme weather phenomena around the world are wreaking havoc on society, attesting to the reality of global warming. If adequate measures are not taken, the harm will become even more severe, and the risks of global-scale damage have been pointed out. It has been reported\* that if further efforts are not made to reduce greenhouse gas emissions and current conditions remain unchanged, average global temperatures could rise by 3.7 to 4.8°C by 2100 compared to pre-industrial levels and that in order to keep the temperature increase to less than 2°C, reducing CO<sub>2</sub> emissions to zero will not be enough—we must reduce emissions to less than zero. Amid global efforts to hold the temperature rise less than 2°C, Toyota sees this situation as both a risk and an opportunity and announced the “New Vehicle Zero CO<sub>2</sub> Challenge.” Toyota will strive to slash average CO<sub>2</sub> emissions per vehicle by 90 percent in comparison with 2010 levels, by 2050.

Based on the idea that eco-friendly vehicles contribute to society only when they come into widespread use, we are not only deploying technologies for conventional engine vehicles, but also accelerating advances in technology and its widespread adoption for the electrified vehicles that Toyota has been developing (including hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs), and fuel cell electric vehicles (FCEVs)). Toyota is committed to continue working hand in hand with stakeholders to build the necessary infrastructure that supports the widespread adoption of these vehicles.

\* 5th Assessment Report of IPCC Working Group III (2014)



### Promoting Development of Next-generation Vehicles Using Electric Power, and Widespread Use According to Their Features

#### Eco-friendly Vehicles Contribute to the Environment Only When They Come into Widespread Use

Toyota has undertaken serious measures to address global environmental issues including global warming, air pollution, and resource and energy problems. In order to solve these social issues, we believe that effective vehicle electrification is essential for the efficient use of energy, and encouraging the use of alternative fuels. Based on the belief that eco-friendly vehicles can contribute to the environment only when they come into widespread use, Toyota has taken the initiative in developing and promoting the use of electrified vehicles. In 1997, we launched the Prius, a predecessor to electrified vehicles, and over the following 20 years, we have improved the performance of the Toyota Hybrid System (THS) and expanded the models on which it is used, developed electrified vehicles based on hybrid technologies, and supported the widespread adoption of these technologies.

In December 2017, we announced the “challenge to promote widespread use of electrified vehicles” covering the period from 2020 to 2030 and are working to encourage broader adoption.

#### Challenge to Promote Widespread Use of Electrified Vehicles

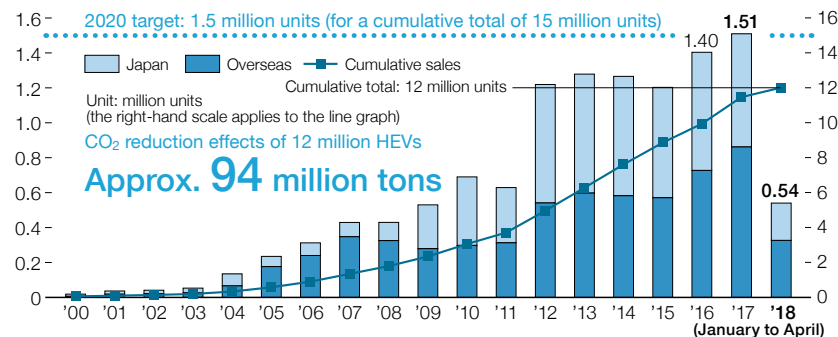
We aim to achieve global sales of at least 5.5 million electrified vehicles including at least 1 million zero-emission BEVs and FCEVs by 2030. We will expand dedicated electrified models and electric options through about 2025 and will have no vehicles available only as an engine model globally.

Starting in 2020, we will accelerate the introduction of BEVs, initially in China, and will expand BEV models to at least 10 in the first half of the decade worldwide. We will also expand the lineup of FCEVs and PHEVs throughout the 2020s. With regard to HEVs, we will raise the efficiency of the THS II while developing various types of hybrid systems such as high-power and simplified versions, expanding the product line-up to meet customer needs.



## Annual HEV Sales and Cumulative Sales (Global)

Third-Party Assurance



## SORA Production Model Fuel Cell Electric Vehicle Bus Launched

Toyota obtained vehicle type certification for the SORA fuel cell electric vehicle (FCEV) bus, a first for a fuel cell electric vehicle bus in Japan, in March 2018. Precisely because the SORA is a vehicle that works for society, the environment has been taken into consideration and it is equipped with the Toyota Fuel Cell System, which can be used as a power supply in the event of a disaster.

Toyota considers FCEVs, which emit no CO<sub>2</sub> or substances of concern during operation and have the potential to achieve massive CO<sub>2</sub> reductions through the use of CO<sub>2</sub>-free hydrogen derived from renewable energy, to be core next-generation eco-friendly vehicles.

Toyota plans to deliver at least 100 FCEV buses, primarily in Tokyo, in advance of the Olympic and Paralympic Games Tokyo 2020. We expect that as FCEV buses operating in urban areas increase, understanding of the FCEV buses among the general public will rise.



## Toyota Achieves the 2020 Sales Target for HEVs Under the Toyota Environmental Challenge 2050, Three Years Ahead of Schedule

Sales of HEVs reached 1.51 million units, a record high in 2017. We achieved the Toyota Environmental Challenge 2050 target for HEV sales in a single year—1.5 million units by 2020—three years ahead of schedule. In addition, cumulative HEV sales since the launch of the Prius in 1997 reached 12 million units (as of April 2018).

## Developing Technologies to Achieve the Leading Fuel Efficiency Performance

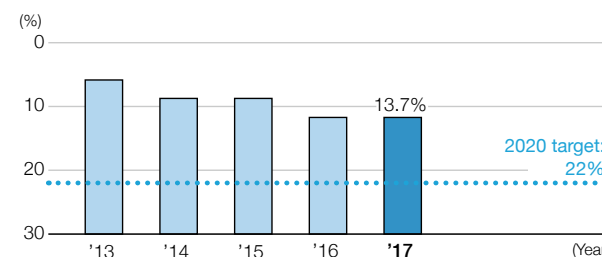
Toyota is committed to reducing the global average CO<sub>2</sub> emissions from new vehicles more than 22 percent by 2020 from the 2010 level to steadily proceed with our challenge. As specific initiatives, we will further improve the environmental performance of electrified vehicles and expand their use in line with developing and deploying powertrains with high environmental performance, based on our next-generation platform strategy known as TNGA\*.

In August 2017, Toyota launched the new Camry, which boasts vastly improved fuel efficiency performance, in Japan. We are expanding hybrid systems, including the October 2017 launch of the JPN TAXI equipped with the newly-developed liquefied petroleum gas (LPG) hybrid system. Along with measures to improve the environmental performance of conventional engine vehicles, we are conducting steady development to achieve our 2020 targets.

\* Toyota New Global Architecture (TNGA): Toyota's company-wide global program to structurally transform automobile design. The goal of TNGA is to dramatically improve the basic performance and marketability of Toyota vehicles by reforming and integrally redesigning powertrain components and vehicle platforms.

Global Average CO<sub>2</sub> Emissions from New Vehicles Reduction Rate Versus 2010 (Japan, U.S., Europe, China)

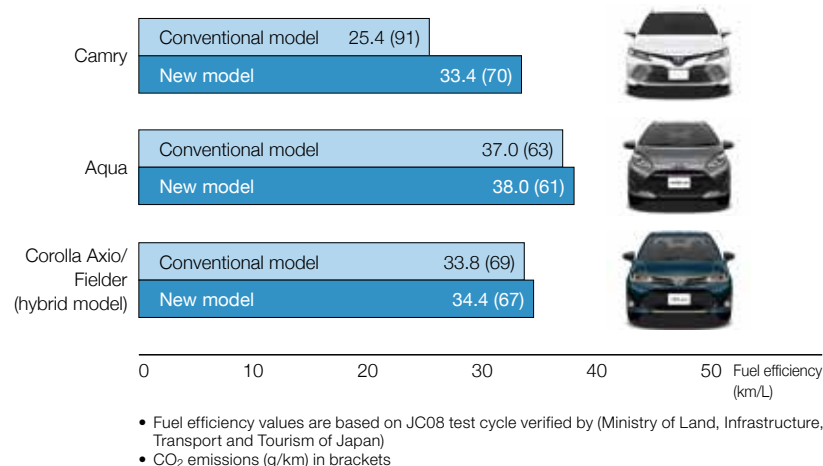
Third-Party Assurance



• The average CO<sub>2</sub> emissions (g/km) of new vehicles in each year, based on the fuel efficiency value (CO<sub>2</sub> emissions) certified by each national authority



## Fuel Efficiency Comparison Between Selected New Models Introduced in FY2018 (in Japan) and Old Models


**JPN TAXI with Exclusive LPG Hybrid Engine Launched**

Toyota launched the JPN TAXI in October 2017. The JPN TAXI embodies the spirit of Japanese hospitality and was developed specifically for use as a taxi to provide usability and comfort to a wide range of people including children, seniors, wheelchair users, and visitors to Japan from abroad. The aim is to change the landscape of Japan, develop barrier-free cities, and contribute to the environment through the widespread use of the JPN TAXI. With regard to environmental performance, the JPN TAXI achieved low fuel consumption of 19.4 km/L in the JC08 test cycle by employing a newly developed LPG hybrid system that runs on LPG based on the THS II hybrid system that Toyota developed over many years. This is approximately double the fuel efficiency of the Crown Comfort (9.8 km/L in 10.15 mode), which has been sold for use as a taxi until now.


**New 2.0-Liter Class TNGA-based Powertrain Developed**

Toyota has been developing and promoting the use of new powertrains and platforms that offer both superb driving performance and high environmental performance based on the TNGA, a development framework aimed at making ever-better cars. Toyota has developed a new 2.0-liter engine, 2.0-liter hybrid system, transmissions (CVT and six-speed manual), and 4WD systems.

Going forward, Toyota will expand models equipped with TNGA powertrains globally, with a target of approximately 80 percent<sup>1</sup> of annual vehicles sales by 2023. Toyota forecasts these TNGA powertrains will have CO<sub>2</sub> reduction effects of at least 18 percent<sup>2</sup>.

■ The new Dynamic Force (2.0L) 2.0-liter direct-injection, inline 4-cylinder gasoline engine

The new 2.0-liter direct-injection, inline 4-cylinder gasoline engine, known as the 2.0-liter Dynamic Force Engine, employs high-speed combustion technology, a variable control system, and other features, achieving the world's highest thermal efficiencies of 41 percent for hybrid vehicles and 40 percent for gasoline vehicles.

■ New 2.0-liter Toyota Hybrid System (THS II)

Toyota has developed the new 2.0-liter Toyota Hybrid System (THS II). This new system preserves the compact, lightweight, and low-loss technologies adopted on the fourth-generation Prius and enhances driving performance while maintaining high environmental performance.

■ New Direct Shift-CVT continuously variable transmission

The new Direct Shift-CVT continuously variable transmission reduces mechanical loss and adopts a wider gear range, achieving transmission efficiency and transmission gear ratio range at the world's highest levels in its class, and improving fuel efficiency by 6 percent.

■ New six-speed manual transmission

The new six-speed manual transmission has been developed to meet needs in Europe and around the world. Compared to conventional products, this new transmission is 7 kg lighter and features a world-leading compact size, contributing to improved fuel efficiency.

■ New Dynamic Torque Vectoring AWD 4WD System

The new Dynamic Torque Vectoring AWD system, a 4WD system for use on gasoline engine vehicles, adopts the ratchet-type dog clutches for the first time in the world. When operating in 2WD mode, the clutches stop rotation of the drive system that transmits driving force to the real wheels, substantially reducing losses.

<sup>1</sup> Toyota-brand sales volume in Japan, the U.S., Europe, and China

<sup>2</sup> The reduction rate in 2023 compared to average CO<sub>2</sub> emissions per new vehicle sold by Toyota in 2015



The new Dynamic Force (2.0L)  
2.0-liter direct-injection, inline  
4-cylinder gasoline engine



2.0L THS II



New Direct Shift CVT  
continuously variable  
transmission



Six-speed manual  
transmission

## Toyota Marks 20th Anniversary of Prius Launch

Since its launch in 1997 as the world's first mass-produced hybrid passenger vehicle, the Prius has endeavored to carve open a new era. It celebrated its 20th anniversary in 2017. The Prius name, derived from the Latin for "to go before," was adopted to embody the idea of a vehicle that will shape the future of the Earth. The Prius has gained the support of many customers who are in agreement with this concept. Based on the concept that eco-friendly vehicles can contribute to society only when they come into widespread use, the Prius and the electrified vehicles that have inherited environmental technologies will strive to contribute to the global environment with the support of its many users.

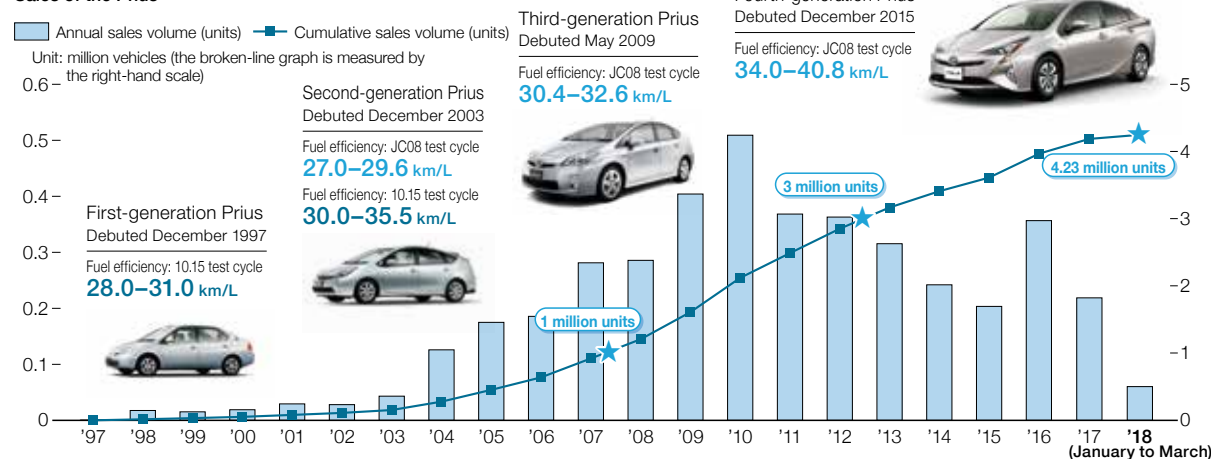
### Looking Back on the Birth of the Prius

The development of the first-generation Prius had a two-fold mission: build a car for the 21st century and transform the way Toyota makes cars. Among the many issues facing the automotive world at the time, we anchored our efforts on two themes—the environment and natural resources. We faced numerous hardships developing an unprecedented vehicle, but we announced the first-generation Prius in October 1997 under the banner "In time for the 21st century" in advance of COP3 (the third United Nations Framework Convention on Climate Change, where the Kyoto Protocol was adopted).

The Prius boasted fuel efficiency approximately double that of gasoline vehicles in the same class at the time and was a pioneering first step not just for the widespread adoption of Toyota hybrid electric vehicles, but also for the current global trend toward widespread use of electrified vehicles.

With each new generation, Toyota is enhancing environmental and driving performance and has increased the number of units sold.

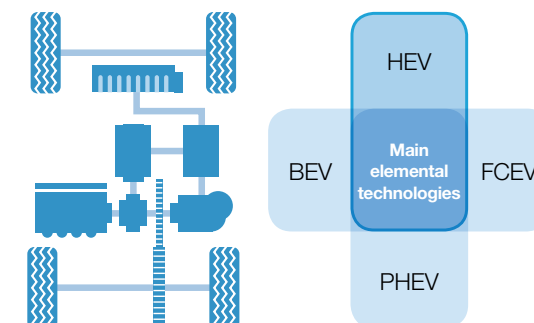
#### Sales of the Prius



### Inheriting Hybrid Technologies

The Toyota Hybrid System (THS) adopted on the first-generation Prius evolved into the second-generation THS II, and later, use was expanded to other models. Toyota positions hybrid technologies as core technologies and is developing a range of electrified vehicles including PHEVs, BEVs, and FCEVs.

Each type of electrified vehicles has its own characteristics and each alternative fuel also has unique strengths and weaknesses. Furthermore, energy conditions and policies vary among countries and regions, and accordingly, Toyota is creating mobility opportunities with an emphasis on energy efficiency by developing and promoting the use of vehicles optimized for each application and each country and region.

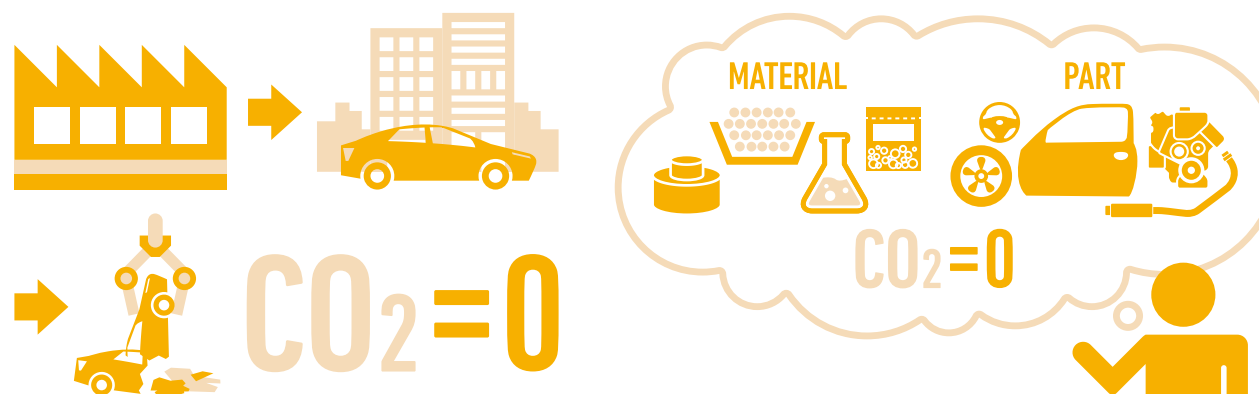


## Challenge 2 Life Cycle Zero CO<sub>2</sub> Emissions Challenge

**Fundamental Approach** To mitigate the various risks posed by climate change, the “Life Cycle Zero CO<sub>2</sub> Emissions Challenge” seeks to completely eliminate CO<sub>2</sub> emissions not only while driving vehicles, but throughout the entire vehicle life cycle including materials and parts manufacturing and vehicle assembly, maintenance, disposal, and recycling.

Some electrified vehicles may have materials and parts that increase CO<sub>2</sub> emissions in the processes of manufacturing. Possible means of reducing this include adopting low CO<sub>2</sub> emitting materials during manufacturing as well as reducing material usage and the number of parts used. It is possible to reduce CO<sub>2</sub> emissions in the disposal and recycling stages by expanding use of recycled materials and designs that make it easier to dismantle vehicles.

We will accelerate eco-friendly designs as we pursue “ever-better cars.”



### Promoting Environmental Management in Product Development (Eco-VAS)

#### Steady Promotion of Environmental Target Management

To reduce the environmental impact of its vehicles, Toyota has introduced the Eco-Vehicle Assessment System (Eco-VAS) to set and achieve environmental targets such as life cycle CO<sub>2</sub> and recyclability, under the guidance of the chief engineer, including at the development stage.

In this system, we conduct LCA\* which assesses the impact of the vehicle life cycle on the environment at all stages including materials and parts manufacturing, vehicle assembly, driving, maintenance, disposal, and recycling. In FY2018, we conducted LCA for one new model, three redesigned models (Camry, Pixis Epoch, and Lexus LS), three partially redesigned models (Aqua, Corolla Axio, and Corolla Fielder), and one improved model (Lexus RS).

The new Camry, launched in August 2017, has life cycle CO<sub>2</sub> emissions that are approximately 19 percent lower compared to the previous Camry.

\* LCA (Life Cycle Assessment): A comprehensive technique to assess vehicle's impact on the environment over the entire life cycle from resource mining through to disposal and recycling, by quantifying the impact of each stage

#### Camry LCA Results



- Evaluations are based on driving a vehicle in JC08 test cycle (Ministry of Land, Infrastructure, Transport and Tourism of Japan) for a lifetime mileage of 100,000 km (Toyota data)
- LCA assessment results are shown as an index



The LCA that Toyota conducts on its passenger vehicles has been tested and certified by German third-party organization TUV Rheinland based on ISO 14040/14044 standards

## Response to Scope 3

Scope 3 is a standard established to measure CO<sub>2</sub> emissions at all stages of a company's business activities and identify areas for future reductions. Scope 3 accounts for not only CO<sub>2</sub> emissions from their activities and those of their consolidated subsidiaries (Scope 1 and Scope 2), but emissions from other stages of the life cycle, such as procured materials and parts, transportation, employee commuting and business travel, along with the driving, maintenance, and disposal of customer vehicles.

The calculation results for FY2018 are overall Scope 3 CO<sub>2</sub> emissions of 412.01 million tons-CO<sub>2</sub>, with category 1 and category 11 combined accounting for the bulk of the total, approximately 97 percent. Category 1 covers emissions from materials and parts at the manufacturing stage, while category 11 covers emissions from vehicles driven by customers. Therefore, use of lightweight parts, materials selection, development of fuel efficiency improvement technologies, and next-generation eco-friendly vehicles are important measures that will lead to CO<sub>2</sub> emissions reduction.

Moving forward, we will continue to monitor Scope 3 emissions and utilize the findings to take measures for developing technologies.

### CO<sub>2</sub> Emissions Ratio of 15 Categories in Scope 3 (FY2018 Global Basis)

Third-Party Assurance

Category	Emissions volume (million tons-CO <sub>2</sub> )	Emissions ratio (%)
1. Purchased goods and services	<b>61.19</b>	14.9
2. Capital goods	<b>4.18</b>	1.0
3. Fuel- and energy-related activities (not included in Scope 1 or 2)	<b>0.95</b>	0.2
4. Upstream transportation and distribution	<b>0.87</b>	0.2
5. Waste generated in operations	<b>0.12</b>	0.0
6. Business travel	<b>0.15</b>	0.0
7. Employee commuting	<b>0.66</b>	0.2
8. Upstream leased assets	—	—
9. Downstream transportation and distribution	<b>0.01</b>	0.0
10. Processing of sold products	<b>1.41</b>	0.3
11. Use of sold products	<b>338.51</b>	82.2
12. End-of-life treatment of sold products	<b>3.79</b>	0.9
13. Downstream leased assets	—	—
14. Franchises	—	—
15. Investments	<b>0.17</b>	0.0
Total for categories 1 through 15	<b>412.01</b>	100

- The calculation range mainly covers financial consolidated automotive businesses
- CO<sub>2</sub> emissions from the use of sold products are calculated from the average fuel efficiency and estimated lifetime mileage of vehicles in Japan, U.S., Europe, China; the consolidated number of vehicles sold in FY2018; and the CO<sub>2</sub> emission factor
- Upstream and Downstream leased assets are included in the other category, and Franchises are not included

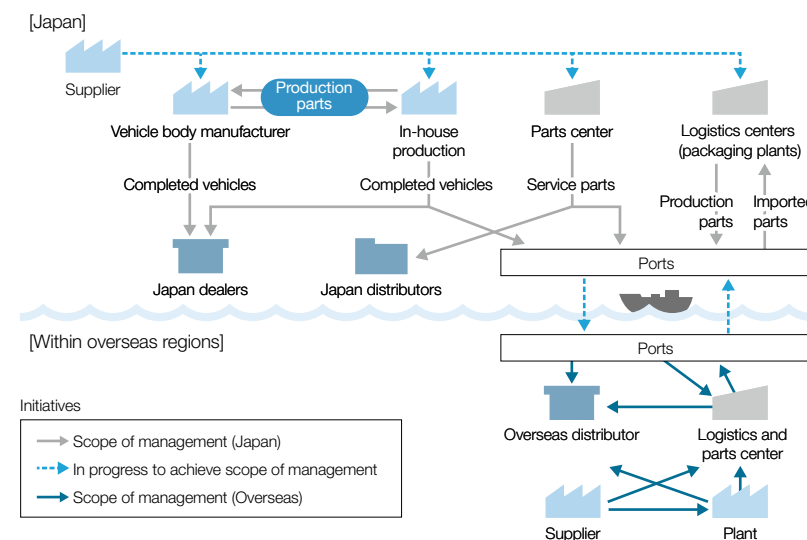
## Pursuing Transportation Efficiency and Reducing CO<sub>2</sub> Emissions in Logistics Activities

To reduce CO<sub>2</sub> emissions in its logistics activities, Toyota Motor Corporation (TMC) is taking measures to improve the transportation efficiency of production parts, completed vehicles, and spare parts.

In FY2018, we continued fuel efficiency initiatives, including loading efficiency improvement activities, shortening logistics routes, and so on, reducing CO<sub>2</sub> emissions per unit of workload (transported volume) to 104.2 g-CO<sub>2</sub>/tkm (down 1.0 percent year on year). CO<sub>2</sub> emissions from logistics operations totaled 0.286 million tons (up 1.4 percent year on year), due largely to an increase in completed vehicles shipments in Japan.

At the global level, Toyota began assessing CO<sub>2</sub> emissions in each country and region in FY2008, and indicated global target guidelines starting in FY2014. Based on these guidelines, each country and region set a goal toward which they have been carrying out reduction activities. As a result, Toyota's global CO<sub>2</sub> emissions in FY2018 totaled 2.17 million tons. We will make a full analysis of results and continuously strive to further improve transportation efficiency and reduce CO<sub>2</sub> emissions per transportation volume.

### Scope of Assessment of CO<sub>2</sub> Emissions in Logistics Activities



Trends in CO<sub>2</sub> Emissions per Ton-kilometer (Transportation Volume) from  
TMC Logistics Operations (Japan)

	FY	2014	2015	2016	2017	2018
CO <sub>2</sub> emissions from logistics (million tons)		0.290	0.278	0.275	0.282	<b>0.286</b>
CO <sub>2</sub> emissions per ton-kilometer (g-CO <sub>2</sub> /tkm)		106.6	109.6	108.4	105.2	<b>104.2</b>

- CO<sub>2</sub> conversion factors: The CO<sub>2</sub> conversion factors were calculated based on guidelines such as the "Guidelines on Disclosure of CO<sub>2</sub> Emissions from Transportation & Distribution (version 3.0)" issued by Ministry of Economy, Trade and Industry and Ministry of Land, Infrastructure, Transport and Tourism of Japan

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Results of TMC Kaizen Initiatives to Reduce CO<sub>2</sub> Emissions (Japan)

Products	Main kaizen activities	Reduction volume (thousand tons)
Completed vehicles	Transportation distances decreased as a result of increased use of maritime transportation and review of production sites	2.4
Production parts	Expansion of railway, etc.	3.1
Service parts	Use of return trips to return empty pallets, etc.	0.4
Total		5.9

Global Logistics CO<sub>2</sub> Emissions

	FY	2017	2018
CO <sub>2</sub> emissions from logistics (million tons)		2.14	<b>2.17</b>

- Total CO<sub>2</sub> emissions from business that handle logistics in each region (seven regions: North America, Europe, China, Southeast Asia, South Africa, South America, Japan) from delivery of production parts, service parts, and completed vehicles
- Transportation between regions (e.g., Japan to North America) has been excluded from the scope of calculations
- Some production and sales businesses (different to businesses that handle logistics) that directly handle deliveries in North America, China, and Southeast Asia have been excluded from the scope of calculations
- CO<sub>2</sub> emissions have been calculated according to the calculation methods of each business
- Errors in FY2017 data were corrected

Column Modal Shift to Ships Implemented Using Port at New Site

To implement a modal shift that will reduce CO<sub>2</sub> emissions by shifting from overland transportation of completed vehicles using car carriers to maritime transportation on ships, Toyota created a port site in Amagasaki City, Hyogo Prefecture and started operations in January 2018.

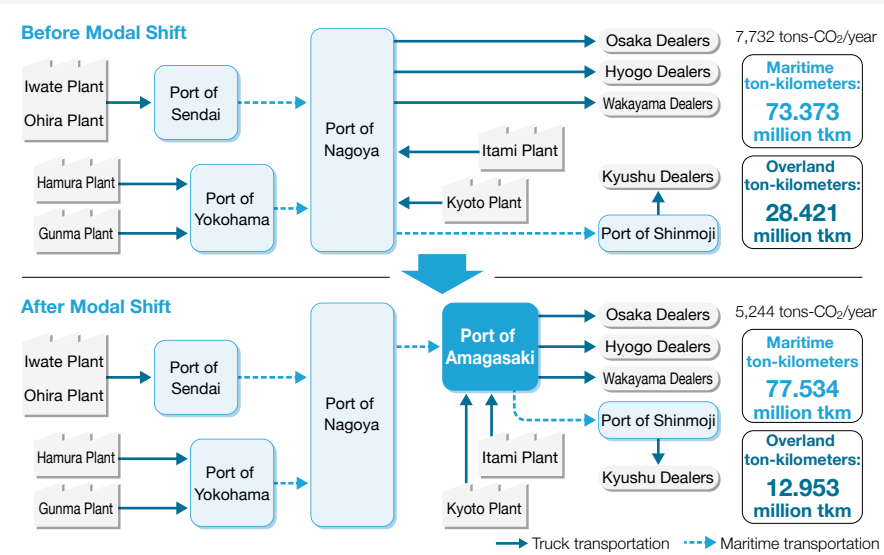
Previously, completed vehicles were transported from the Tohoku and Kanto regions to the Kansai region went overland from the Port of Sendai or the Port of Yokohama to the Port of Nagoya by sea, and from there the vehicles were transported overland to individual dealers.

With the recent creation of the Amagasaki Port Service Branch, vehicles are transported by ship from Nagoya to Amagasaki and then transported overland to dealers.

Also, until now, completed vehicles from plants in the Kansai region shipped to Kyushu were transported by ship via the Port of Nagoya to Shinmoji in Fukuoka Prefecture, but now this route uses the Port of Amagasaki, resulting in shorter distances overland from plants to the port and at sea to the Port of Shinmoji.

These modal shifts are expected to cut CO<sub>2</sub> emissions from 7,732 tons annually to 5,244 tons annually, a reduction of 2,488 tons.

Cargo ton-kilometers in overland transportation are expected to decline 15,468 thousand tkm.





## CO<sub>2</sub> Reduction Through Joint Transportation (India)

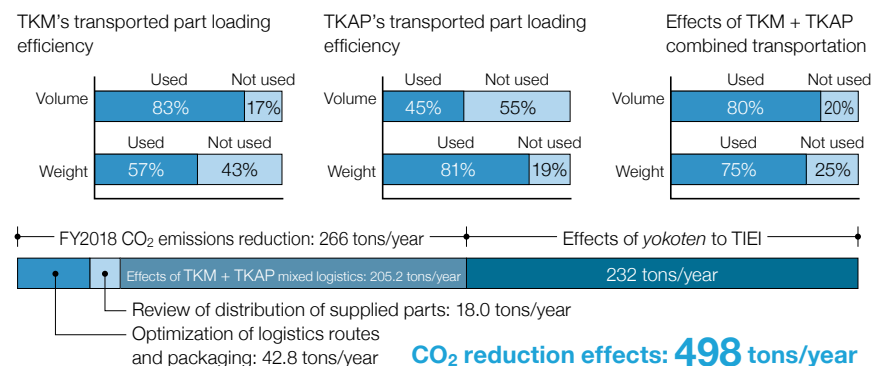
TKM, an affiliate that assembles vehicles, and TKAP, an affiliate that manufactures parts, are both located in Bangalore in southern India. Their plants are 2 km from each other. They are separate companies, however, and each plant conducted its own transportation of production parts.

Recently, the two companies began joint transportation efforts to reduce CO<sub>2</sub> emissions in logistics. Not only do the companies have many suppliers in common, but also TKM transports many large, lightweight items, while TKAP transports numerous small but heavy objects. With the utilization of joint transportation, it is possible to reduce the number of transportation trucks by carrying mixed loads of heavy and light parts.

However, there were various challenges in order to realize joint transportation, such as different ordering systems used by TKM and TKAP, different plant operating days, and the cost allocation method for joint transportation. The two companies held discussions and were able to take countermeasures such as setting suitable inventories.

In conjunction with the start of joint transportation, they also reviewed transportation routes, and as a result, CO<sub>2</sub> emissions were reduced by a total of 266 tons per year. Furthermore, the joint transportation was expanded through *yokoten*\* to Toyota Industries Engine India (TIEI), reducing emissions by an additional 232 tons per year. Ongoing efforts will be made to cut CO<sub>2</sub> through further reviews of routes and the application of *yokoten* to other plants.

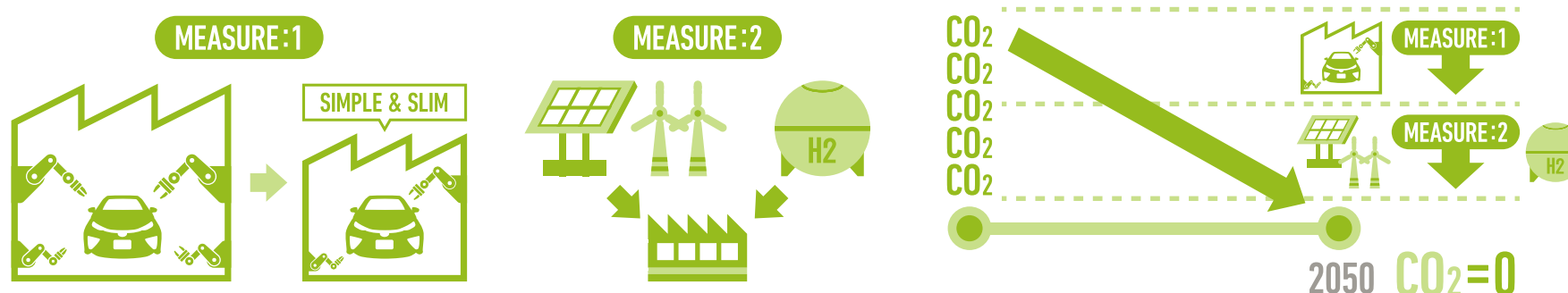
\* *Yokoten* refers to sharing of improvement practices, know-how, non-compliance and other information within the All-Toyota Group



## Challenge 3 Plant Zero CO<sub>2</sub> Emissions Challenge

**Fundamental Approach** The Plant Zero CO<sub>2</sub> Emissions Challenge seeks zero CO<sub>2</sub> emissions in the vehicle manufacturing process. To achieve this, Toyota is introducing innovative technologies, conducting daily *kaizen*, introducing renewable energy, and utilizing hydrogen. First of all, processes and the time required were reduced by simplifying and streamlining manufacturing processes, which made an improvement to energy use efficiency, including equipment optimization and the use of waste heat. Furthermore, we use every possible means to reduce CO<sub>2</sub> emissions including introducing an innovative process called *karakuri* that does not consume any energy source at all.

In addition, we will effectively utilize renewable energies such as solar power and wind power along with hydrogen energy.



### Reduce CO<sub>2</sub> Emissions in Production Activities

#### Introduction of Innovative Technologies and Daily Kaizen

In our production activities, we have been developing and introducing low-CO<sub>2</sub> production technologies along with taking daily improvement measures to achieve our reduction targets.

In FY2018, Toyota Motor Corporation (TMC) plant manufacturing divisions worked with production engineering and drive force personnel to conduct energy diagnoses at production sites, propose improvements, implement measures, and undertake energy-saving activities (internal ESCO activities). In addition, TMC continuously undertook *yokoten*\* of best practices. *Yokoten* places particular emphasis on adoption of steamless and airless processes and shifting to LED lighting, thereby increasing examples that can be expanded from common processes to multiple processes and sharing information on best practices to accelerate daily *kaizen*. As a result, we reduced total CO<sub>2</sub> emissions to 1.14 million tons (down 1.4 percent year on year), and CO<sub>2</sub> emissions per unit produced to 0.394 tons (down 1.1 percent year on year).

Globally, measures for the development of overseas human resources as activity leaders were taken and *genchi genbutsu* training was conducted to make internal ESCO activities more autonomous and accelerate them. *Kaizen* was also achieved by increasing TMC best-practice (from 29 examples to 62 examples) and expanding it to subsidiaries in Japan and to overseas plants.

Affiliated companies in Japan actively implemented internal ESCO activities, but some companies had higher energy consumption as a result of increased aluminum wheel production in conjunction with efforts to make vehicles lighter. Also, CO<sub>2</sub> emissions reduction effects were achieved through the purchase of renewable energy and installation of solar panels and in-house power generation for internal consumption. As a result of these measures, total CO<sub>2</sub> emissions were 7.79 million tons (down 0.2 percent year on year), and CO<sub>2</sub> emissions per unit produced were 0.740 tons (down 0.2 percent year on year).

In order to reduce CO<sub>2</sub> emissions from production activities, we will strive to accelerate our energy saving activities, carrying out internal ESCO activities and other activities.

\* *Yokoten* refers to sharing of improvement practices, know-how, non-compliance and other information within the All-Toyota Group



Challenge 1  
New Vehicle Zero CO<sub>2</sub> Emissions Challenge

Challenge 2  
Life Cycle Zero CO<sub>2</sub> Emissions Challenge

Challenge 3  
Plant Zero CO<sub>2</sub> Emissions Challenge

Toward Realizing  
a Decarbonized Society in 2050

Challenge 4  
Challenge of Minimizing and Optimizing Water Usage

Challenge 5  
Challenge of Establishing a Recycling-based Society and Systems

Challenge 6  
Challenge of Establishing a Future Society in Harmony with Nature

Environmental  
Management

### Trends in Total CO<sub>2</sub> Emissions (from Energy Consumption at Stationary Emission Sources) and CO<sub>2</sub> Emissions per Unit Produced at TMC

[Third-Party Assurance](#)

	FY	2014	2015	2016	2017	2018
Total CO <sub>2</sub> emissions (million tons)		1.20	1.18	1.15	1.16	<b>1.14</b>
CO <sub>2</sub> emissions per unit produced (tons/unit)		0.414	0.413	0.408	0.398	<b>0.394</b>

- Scope: Production and non-production divisions (excluding employee benefit facilities)
- Conversion factors: CO<sub>2</sub> emissions were calculated using the Nippon Keidanren's 1990 conversion factors

[Environmental Data p. 64-V](#)

Plant and Work Site Environmental Data

[Web https://www.toyota-global.com/sustainability/environment/data/sitedata18\\_full\\_en.pdf](https://www.toyota-global.com/sustainability/environment/data/sitedata18_full_en.pdf)

### Trends in Global Total CO<sub>2</sub> Emissions (from Energy Consumption at Stationary Emission Sources) and CO<sub>2</sub> Emissions per Unit Produced

[Third-Party Assurance](#)

	FY	2014	2015	2016	2017	2018
Total CO <sub>2</sub> emissions (million tons)						
Japan (TMC)		1.26	1.25	1.21	1.20	<b>1.19</b>
Japan (consolidated EMS and its subsidiaries)		3.73	3.66	3.55	3.57	<b>3.61</b>
North America		1.13	1.17	1.13	1.21	<b>1.19</b>
China		0.66	0.65	0.69	0.70	<b>0.73</b>
Europe		0.29	0.29	0.27	0.30	<b>0.30</b>
Asia (excluding Japan), Australia, Middle East, South Africa, Latin America		0.77	0.77	0.72	0.83	<b>0.77</b>
Total		7.84	7.79	7.57	7.81	<b>7.79</b>
Direct emissions (Scope 1) (million tons)		2.80	2.72	2.49	2.55	<b>2.55</b>
Indirect emissions (Scope 2) (million tons)		5.04	5.07	5.08	5.26	<b>5.24</b>
CO <sub>2</sub> emissions per unit produced (tons/unit)		0.757	0.753	0.744	0.741	<b>0.740</b>

- Scope of coverage: TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 121 companies
- GHG Protocol was used to calculate emissions
- Conversion factors: [Environmental Data p. 63-R](#)
- Errors in FY2017 data were corrected

[Environmental Data p. 63-R](#)

### Introducing Renewable Energy and Utilizing Hydrogen

Toyota is promoting the introduction of renewable energy, taking into consideration the characteristics of each country and region. When introducing renewable energy, we place the highest priority on in-house generating facilities (such as solar power generation) and in-house consumption at Toyota plants and other facilities.

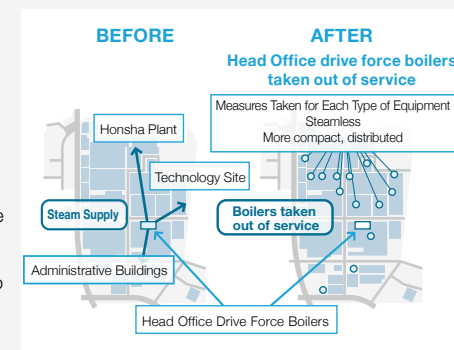
In FY2018, we generated 17,578 MWh of renewable energy globally (see pp. 31–33 for information on hydrogen use).



### Steamless Processes at Head Office (Japan)

Boiler facilities at TMC Head Office supply steam to three locations—the Honsha Plant, administrative office building, and Head Office Technology Site. In FY2015, the total volume of steam supplied reached 120,000 tons. The supply losses with steam are high, and half or less of the energy can be effectively used, so TMC starting planning measures to eliminate the use of steam under the CO<sub>2</sub> zero challenge in FY2016. Specifically, in order to stop steam emissions from the Head Office drive force boiler, energy-saving measures were taken in that facilities used in each process were converted to those that do not use steam, and high-efficiency small-scale boilers were installed for facilities that require steam.

As a result of taking energy-efficient measure, it was possible to cease the use of the Head Office drive force boiler facilities by March 2018, and air conditioning CO<sub>2</sub> emissions fell by 10,000 tons, from 18,000 tons to 8,000 tons, in FY2018.



### Measures to Reduce Energy Usage Through Temperature and Humidity Control in Painting Booths (India)

TKM, an Indian affiliate, won the Best Kaizen Award in the Kaizen Conference & Competition held by the Confederation of Indian Industry (CII) in June 2017.

Controlling temperature and humidity in painting booths according to the type of paints used is crucial for maintaining painting quality. TKM improved this by installing programmable logic controllers (PLC). Based on daily changes in temperature and humidity over the course of a year, the PLC are programmed to control temperature and humidity at appropriate levels in painting booths.

The result was a decrease in wasteful cooling and reheating and a 390,000 kWh reduction in annual energy consumption (approximately 15 percent).



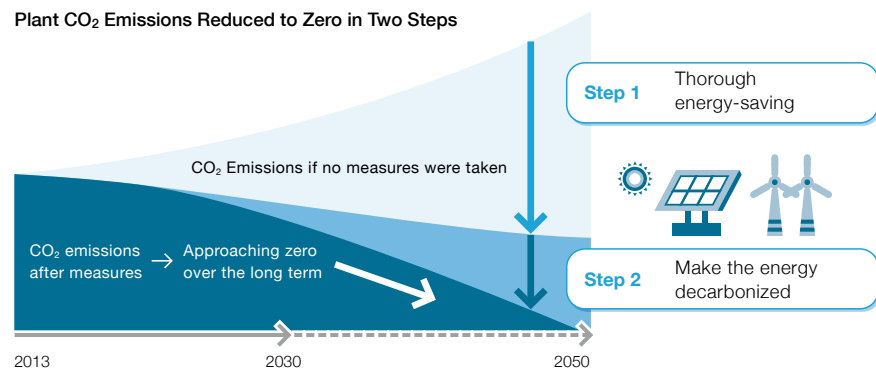
TKM receiving the Best Kaizen Award

## Toward Realizing a Decarbonized Society in 2050: Effective Use of Renewable Energy

These days, one means of decarbonization that holds particular promise is renewable energy. Toyota is working to reduce CO<sub>2</sub> through comprehensive energy-saving measures by deploying innovative technologies and daily *kaizen*. However, it is not feasible to reduce the amount of energy used to zero only by introducing these energy-saving activities in manufacturing. To decarbonize the remaining energy, it is necessary to introduce renewable energy and use hydrogen.

The use of renewable energy is an issue that needs to be addressed by all of society, and accordingly, we are collaborating with many parties including the national and local governments as well as local communities and other businesses.

### Plant CO<sub>2</sub> Emissions Reduced to Zero in Two Steps



Refer to Challenge 3 (pp. 28–29) for examples of specific measures.

### Three Perspectives on the Effective Use of Renewable Energy

The effective use of renewable energy requires comprehensive investigation from the perspectives of environmental, regional, and economic factors. First, we introduce in-house power generation (such as solar power generation) at our own plants and other facilities. Then we consider external purchases. Already, TDB, our affiliate in Brazil, has introduced energy sourced from hydropower generation, and we will proceed with implementation in stages starting with high-suitability areas, taking into regional and environmental characteristics into consideration.

Toyota will strive to introduce systems and mechanisms that will lead to the widespread use of renewable energy. Our objective is to achieve zero CO<sub>2</sub> emissions at plants all over the world by 2050.

\* When contracting for and purchasing electric power, we carefully check the type of source and select the one with the lower environmental impact

### Main Affiliates That Use Renewable Energy in Each Region of the World

#### Europe region

TMUK (U.K.)  
TMMF (France)

#### China

TFAP  
GTMC  
TMCA

#### Japan

Toyota Motor Corporation\*  
JTEKT Corporation  
Toyota Motor East Japan, Inc.  
Denso Corporation  
Toyota Boshoku Corporation  
Toyota Housing Corporation  
Primearth EV Energy Co., Ltd.  
Toyota Auto Body Co., Ltd.  
Admatechs Co., Ltd.

#### North America region

TMMK (U.S.)  
TMMBC (Mexico)

#### Asia-Pacific region

TMCA (Australia)  
Kuozui (Taiwan)  
TKM (India)  
TKAP (India)  
IMC (Pakistan)  
ASSB (Malaysia)  
TMMIN (Indonesia)

#### South Africa region

TSAM (South Africa)

#### South America region

TDB (Brazil)

\* Honsha Plant, Motomachi Plant, Tsutsumi Plant, Higashi-Fuji Technical Center

### Renewable Energy Covers All Electric Power at North American Headquarters Campus

Toyota Motor North America, Inc. (TMNA), which marked 60 years of business in the United States, constructed a new headquarters campus in Plano, Texas. The designs feature exterior walls made predominantly from glass to maximize use of natural lighting. Also, southern exposures have generous roof overhangs to control sunlight to appropriate levels. Moreover, the buildings and parking facility have more than 20,000 solar panels installed, providing more than 30 percent of the electric power used in the buildings. Electricity is also purchased from wind power generated in Texas, and as a result, renewable energy covers all electric power usage. These efforts were recognized by the U.S. Green Building Council, and the facility received LEED Platinum, the highest level of LEED environmental certification.



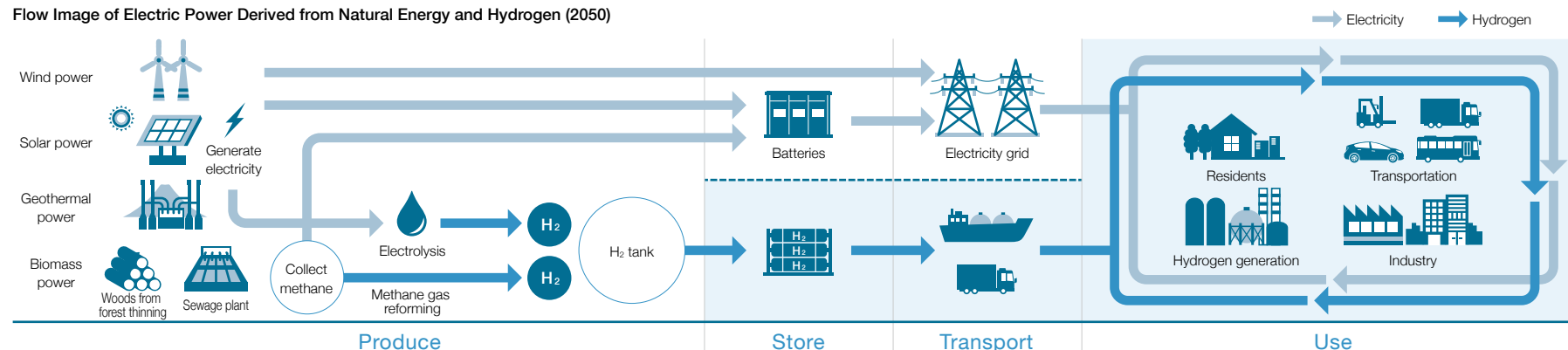
TMNA's new North American Headquarters Campus (solar panels installed on the building)

## Toward Realizing a Decarbonized Society in 2050: Use of Hydrogen Energy

In conjunction with the rising use of electricity derived from natural energy in recent years, hydrogen holds great promise as a means of absorbing fluctuations and surpluses in renewable energy and for energy storage and transportation.

Toyota is participating in the creation of mechanisms for the use of hydrogen energy throughout society and is contributing to the realization of a decarbonized society.

Flow Image of Electric Power Derived from Natural Energy and Hydrogen (2050)



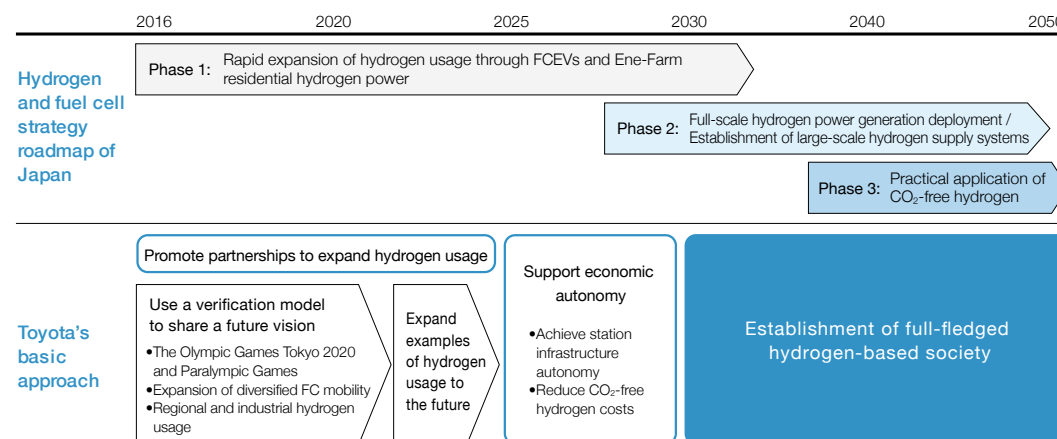
### Strategies and Steps

Building infrastructure and making hydrogen widespread as a new energy are major challenges to realizing a hydrogen-based society. Toyota is promoting the widespread use of fuel cell electric vehicles (FCEVs) and actively collaborating national and local governments, local communities, and industries. We will strive to expand the use of hydrogen and make it economically viable.

#### Toyota's Current Mission

- (1) Achieve a hydrogen-based society through the widespread use of FCEVs
- (2) Collaborate with government, local communities, and the energy industry to build structures and perform verification tests

#### Aligning Toyota's Strategies and Steps with National Policies of Japan (Examples in Japan)



## Main Projects in Japan (Collaboration with Local Communities)

Toyota's FCEV sales target for around 2020 is at least 30,000 units annually on a global basis, including at least 10,000 units in Japan.



## Plants

**Green hydrogen network for local production and local consumption Fukuoka Prefecture-led initiative to promote collaborative activities among industry-government-academia**

(Fukuoka Prefecture, since March 2017)

Use of CO<sub>2</sub>-free hydrogen produced from solar power in fuel cell fork lift trucks

**Toyota's role**

Toyota Motor Kyushu participated in the verification tests for hydrogen use at plants, representing the industry model

## Plants

**Development of low-carbon hydrogen supply chain in Aichi Prefecture starts**

(Aichi Prefecture, since May 2018)

Aichi Prefecture, Chita City, Toyota City, Chubu Electric Power Co., Ltd., Toho Gas Co., Ltd., Toyota Motor Corporation, and Toyota Industries Corporation established an organization to promote collaboration among industry, academia, and government 2030 vision and roadmap formulated

**Toyota's role**

Certification received for first project to transport biomass gas from the Chita City Purification Center to the Toyota Motomachi Plant and manufacture and use hydrogen



## Plants

**Expanded and improved fuel cell stack and high-pressure hydrogen tank production facilities in preparation for sales expansion starting in 2020**

(Aichi Prefecture, since May 2018)

Fuel cell stacks: Honsha Plant  
High-pressure hydrogen tanks: Shimoyama Plant

**Toyota's role**

Pursuing comprehensive reductions in CO<sub>2</sub> during FCEV production as one measure for achieving the 2050 Plant Zero CO<sub>2</sub> Emissions Challenge

## Energy creation

**Fukushima Concept for a New Energy Society Conference**

(Fukushima Prefecture, since March 2016)

**Toyota's role**

Provide means of mobility such as fuel cell electric vehicle buses (FCEV buses) and fuel cell forklift trucks

## Energy creation

**Japan H<sub>2</sub> Mobility, LLC established**

(Tokyo, since March 2018)

Established by Toyota Motor Corporation, Nissan Motor Co., Ltd., Honda Motor Co., Ltd., JXTG Nippon Oil & Energy Corporation, Idemitsu Kosan Co., Ltd., Iwatani Corporation, Tokyo Gas Co., Ltd., Toho Gas Co., Ltd., Air Liquide Japan Ltd., Toyota Tsusho Corporation, and Development Bank of Japan Inc.

**Toyota's role**

Participate in the LLC and operate hydrogen stations through collaboration with parties located throughout Japan



## Community

**KIX Project, Kansai International Airport Verification of airport model for hydrogen grid (large-scale, centralized model)**

(Osaka Prefecture, since May 2014)

Use of CO<sub>2</sub>-free hydrogen produced from solar power in fuel cell fork lift trucks

**Toyota's role**

Toyota Motor Corporation, Toyota Industries Corporation, and Toyota Tsusho Corporation will support the KIX Hydrogen Grid Committee of Kansai International Airport with their knowledge on hydrogen and fuel cell technologies

## Energy creation

**Keihin Project, Keihin Coastal Area Renewable energy Supply chain verification from hydrogen production to usage (small- to medium-scale dense office model)**

(Kanagawa Prefecture, since September 2015)

Use of CO<sub>2</sub>-free hydrogen produced from solar power in fuel cell fork lift trucks

**Toyota's role**

Toyota will represent business users of hydrogen

## Community

**Olympic and Paralympic Games Tokyo Demonstrate models of the next-generation mobility society and a clean, hydrogen-based society to the world**

(Tokyo, through 2020)

**Toyota's role**

Support as a Worldwide partner of the IOC, as well as providing mobility means such as FCEVs and FCEV buses, and initiatives for the next-generation mobility society



SORA production model fuel cell electric vehicle bus launched (March 2018). Toyota plans to deliver more than 100 FCEV buses for the Olympic Games Tokyo 2020 and Paralympic Game.

## Major Overseas Projects (Partnerships for the Widespread Use of FCEVs and Hydrogen Usage)

Country	Project Name
Australia	MIRAI test launch (July 2016)
UAE	Participated in joint research for realizing a hydrogen-based society (January 2017)
China	Started driving experiment by launching MIRAI on a test basis (January 2017)
Canada	Started driving experiment by launching MIRAI on a test basis (February 2017)
U.S.	Shell and Toyota collaborate on building a hydrogen station network in California (February 2017)
U.S.	Started verification tests for large-scale FC trucks at the Port of Los Angeles (April 2017)
U.S.	TMNA, an American affiliate, establishes Tri-Gen to produce hydrogen, electricity, and water from biomass (December 2017)

### Expansion of the Hydrogen Council

In January 2017, the Hydrogen Council was established in Davos, Switzerland as the first global hydrogen initiative. The council is represented by leaders from global companies including Toyota striving to promote hydrogen usage as a means to achieve climate change goals.

In November 2017, the Council announced the world's first concrete vision for the use of hydrogen. Due to advances in hydrogen-related technologies, hydrogen is expected to account for 18 percent of final energy demand by the middle of the 21st century, reducing CO<sub>2</sub> emissions by 6.0 billion tons, generating 2.5 trillion dollars in business annually, and creating jobs to 30 million people.

Eleven leading companies in the petroleum, gas, energy, chemicals, technology, and automotive fields in Asia, North America, and Europe joined the Council as new members in March 2018.

The number of members reached 39 companies in one year since the Council's establishment, which is sure to spur innovation in hydrogen-related technologies.

### Forecast of the Effects of Hydrogen-related Technologies

Percentage of final energy accounted for: **18%**

Converted amount of annual business: **\$2.5 trillion**

CO<sub>2</sub> emissions: **6.0 billion tons**

Projected employment creation effects: **30 million jobs**

## TMNA Builds Tri-Gen to Produce Hydrogen, Electricity, and Water from Biomass

TMNA, a U.S.-based affiliate, will build Tri-Gen, a fuel cell power generation plant (2.35 MW) and hydrogen station, at the Port of Long Beach in California in collaboration with Fuel Cell Energy, Inc. Tri-Gen will extract hydrogen from biogas derived from livestock waste and sewage and generate electricity from molten carbonate fuel cells\*, producing electricity, heat and water entirely. Construction will begin in 2018, and operations are scheduled to commence around 2020.

The daily generating capacity will be enough to power approximately 2,350 average-sized homes, and the 1.2 tons of hydrogen produced will meet the daily driving needs of approximately 1,500 fuel cell electric vehicles. A portion of the electricity generated and the water produced will be supplied to the Long Beach site of Toyota Logistics Service, meeting all of the site's electric power needs with renewable energy. The hydrogen will be supplied via the adjacent hydrogen station to fuel pre-delivery new deliveries of Mirai FCEVs and the heavy-duty commercial fuel cell trucks that have been in trial operation since 2017.

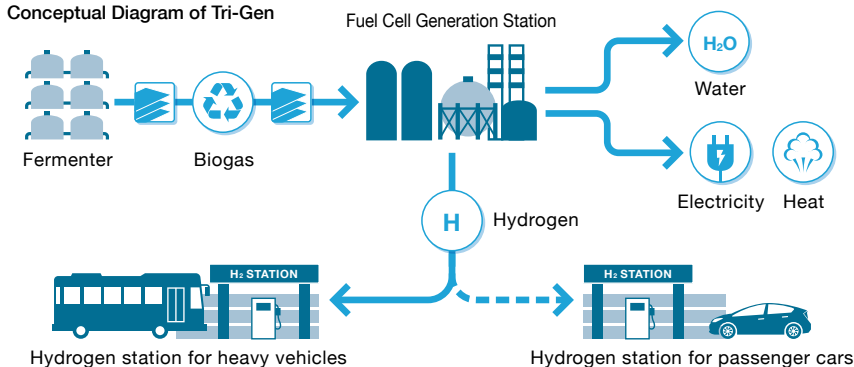
\* Molten carbonate fuel cell:

A fuel cell that uses molten carbonate as the electrolyte and operates at 600°C to 700°C. Households and automobiles use polymer electrolyte fuel cells, which operate at temperatures of approximately 80°C.



Heavy-duty commercial fuel cell truck

### Conceptual Diagram of Tri-Gen





## Challenge 4 Challenge of Minimizing and Optimizing Water Usage

**Fundamental Approach** According to forecasts, the world's population will grow to 9.1 billion by 2050, water demand will increase 55 percent from current levels, and 40 percent of the world's population is therefore expected to suffer water shortages\*.

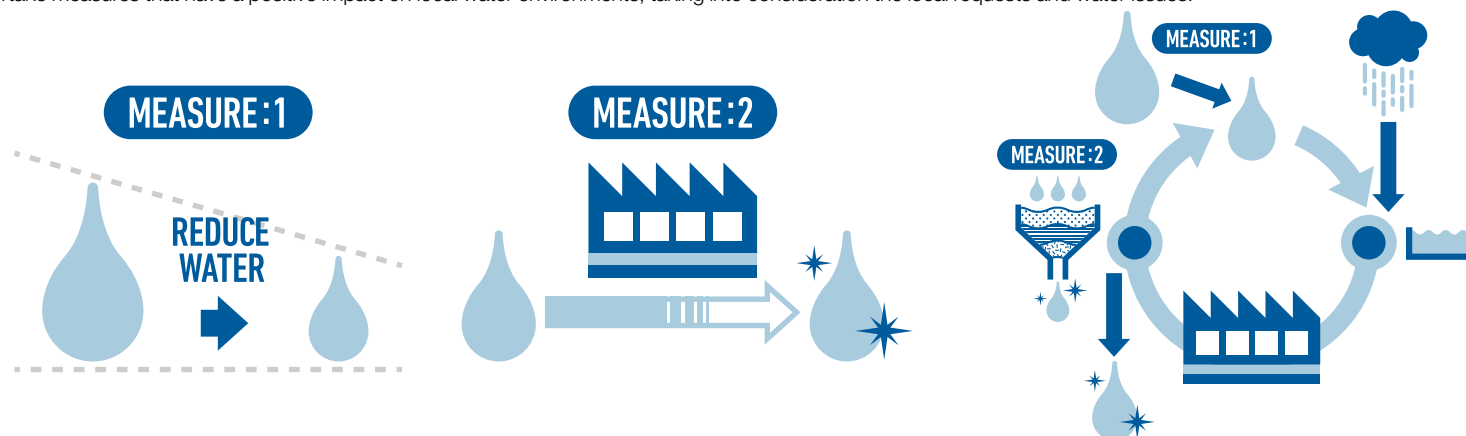
Water problems such as increases in water stress in conjunction with rising populations and stricter regulations in response to deterioration of water quality in rivers and other water sources are important issues from the perspective of risks in corporate activities.

Water is used in painting and other car manufacturing processes. This makes it imperative to reduce the impact on the water environment, to whatever degree possible.

There are significant differences in the characteristics of the water environment depending on the region, but we have two main strategies: thoroughly reduce the amount of water used and comprehensively purify water and return it to the environment. Toyota has implemented various initiatives such as collecting rainwater to reduce industrial water usage, cutting water usage in production processes, recycling wastewater to reduce amounts withdrawn from water sources, and returning high-quality water to local environments.

In the future, we will undertake measures that have a positive impact on local water environments, taking into consideration the local requests and water issues.

\* According to Toyota data



### Measures Undertaken in Accordance with the Toyota Water Environment Policy

Although water-related issues and measures differ depending on the region, Toyota established the Toyota Water Environment Policy and takes action in order to achieve the goals of our water environment Challenge on a global level.

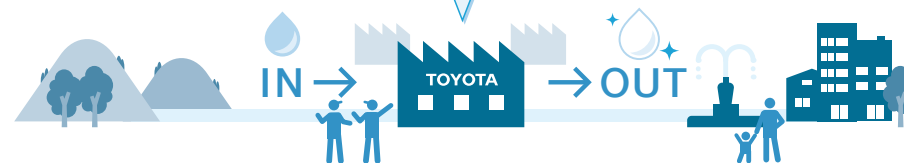
Under the Toyota Water Environment Policy, we are assessing our impact on water environments and working to minimize those impacts from two perspectives: the input side, where we are taking thorough measures to reduce water usage, and the output side, where we are taking comprehensive measures to purify water.

We take action from three directions—the pursuit of environmental technologies, community-rooted operations, and cooperation with society—and strive to be the region's leading plant linked to regional prosperity.

### Toyota Water Environment Policy

Striving to consider the importance of water sustainability, Toyota will aim for realizing prosperous societies that will share a sound water environment to the future.

**Become No. 1 regional plant leading to the prosperity of entire societies**



**Thoroughly reduce the amount of water usage**

Minimize the impact on regional water resources by minimizing water withdrawal and utilizing rainwater

**Clean thoroughly and return**

Have a net positive impact on the environment by returning clean water in the local water environment

## Reduce Water Usage in Production Activities

To reduce water usage in our production activities, we have been working to introduce innovative technologies alongside planned upgrades to our production lines, and to conduct daily measures to reduce water usage.

In FY2018, Toyota Motor Corporation (TMC) took measures in painting pretreatment processes, which use large amounts of water, such as implementing recycling of water discharge in chemical coating processes and optimizing washing nozzles in electrodeposition coating processes to raise the efficiency of use within processes. As a result, total water usage was 10.3 million m<sup>3</sup> (down 3.2 percent year on year). Water usage per unit produced was 4.0 m<sup>3</sup> (down 7.6 percent year on year).

Globally, Toyota is steadily implementing measures to reduce water usage according to the actual water environment in each country and region. However total water usage rose to 32.9 million m<sup>3</sup> (up 0.4 percent year on year) because of increased washing in pretreatment processing due to quality measures implemented in conjunction with model redesigns and process changes. Water usage per unit produced was 3.1 m<sup>3</sup>, up 1.2 percent year on year.

Moving ahead, we will continue striving to minimize impacts on the water environment through the promotion of water-saving and water recycling.

### Trends in Total Water Usage and Usage per Unit Produced at TMC

Third-Party Assurance

	FY	2014	2015	2016	2017	2018
Total water usage (million m <sup>3</sup> )		11.6	11.5	10.9	10.7	10.3
Water usage per unit produced (m <sup>3</sup> /unit)		4.9	4.9	4.7	4.3	4.0

- Scope of coverage: Production and non-production divisions (excluding employee benefit facilities)
- Water usage per unit produced indicates the amount of water consumed per unit produced at vehicle assembly plants

### Trends in Global Total Water Usage and Usage per Unit Produced

Third-Party Assurance

	FY	2014	2015	2016	2017	2018
Total water usage (million m <sup>3</sup> )						
Japan (TMC)		5.3	5.2	4.9	4.7	4.5
Japan (consolidated EMS and its subsidiaries)		12.1	11.9	11.3	12.6	13.1
North America		5.0	5.3	5.0	6.0	5.7
China		2.6	2.5	2.5	2.6	2.7
Europe		1.4	1.2	1.1	1.4	1.6
Asia (excluding Japan), Australia, Middle East, South Africa, Latin America		4.8	4.9	4.5	5.5	5.3
Total		31.2	31.0	29.3	32.8	32.9
Water usage per unit produced (m <sup>3</sup> /unit)		3.1	3.0	2.9	3.1	3.1

- Scope of coverage: Vehicle assembly plants of TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 37 companies
- Errors in FY2017 data were corrected



## Toyota's Water Environment Challenge: Connecting with Society

### Thoroughly Reduce the Amount of Water Usage (Policy 1)

#### Evaluate Impact on the Water Environment Through Dialogue with Local Affiliates

Based on evaluations of the impact of water usage volume on the water environment, we set four plants (see p. 37) in three regions as challenge-focused plants and are taking action. Some regions have few water resources but in fact water is stably supplied, and therefore, the impact evaluation and local understanding were not in agreement in those regions. Discussions regarding these regions had been conducted over the course of six months, taking into consideration issues that have arisen and potential future impacts from climate change and other factors of concern. In addition, we collected more detailed regional water-related information and continuously updated impact evaluations to reach mutual understandings. This led to enhanced awareness of our efforts to reduce water usage and invigorate activities.

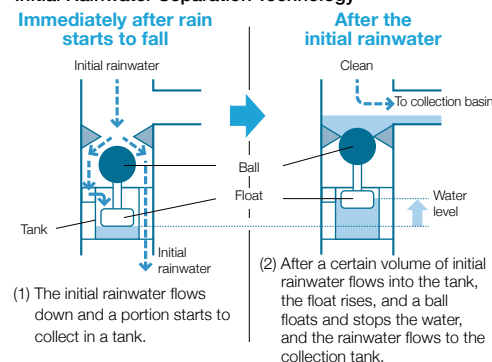
#### ■ Case study 1: *Karakuri*\* used to develop initial rainwater separation system (Japan)

Using rainwater is an effective means of reducing the amount of industrial water used in production processes, but reuse as industrial water requires filtering and other purification and treatment, giving rise to issues regarding the treatment costs. The initial rainwater in particular washes contamination off buildings and needs to be treated. To address this issue, *karakuri* was used to develop a device that can separate the initial rainwater, which contains large amounts of contaminants.

Verification tests began in December 2016. They confirmed the quality of the recovered water and the maintainability and durability of the device. From now on, the initial rainfall that descends onto the roof of a plant, etc., will be separated in order to reuse clean rainwater, which will lead to a reduction in the amount of water used at plants.

\* *Karakuri* refers to mechanisms that do not use electricity or other energy sources

#### Initial Rainwater Separation Technology



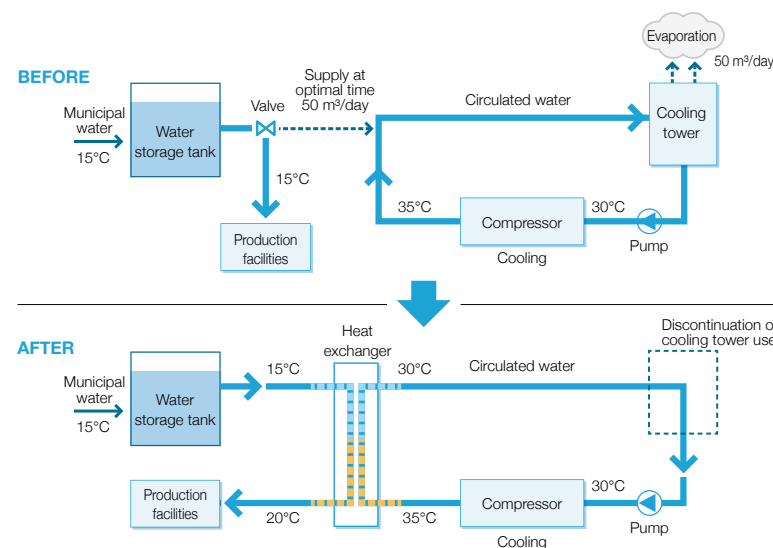
#### ■ Case study 2: Reducing water usage by eliminating water cooling towers (Turkey)

At TMMT, an affiliate in Turkey, *kaizen* activities are reducing water usage.

Until now, the temperature of the water circulated in order to cool the compressor that makes compressed air was cooled by means of a cooling tower. However, it was necessary to supply approximately 50 m<sup>3</sup> in additional water each day to cooling towers that evaporate water in order to lower the temperature.

Now, using low-temperature municipal water (15°C), we have introduced a new cooling system that lowers the temperature of circulated water through a heat exchanger.

This *kaizen* made it possible to discontinue the use of cooling towers and supply water became unnecessary, so water usage was reduced by 0.06 m<sup>3</sup> per unit produced, and annual water usage is down 16,500 m<sup>3</sup>.



## Clean Water Thoroughly and Return (Policy 2)

### Priority Regions for Water Quality Selected

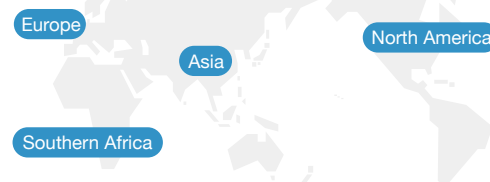
Not only do we comply strictly with laws and regulations regarding the water discharge quality, we are working to maintain and control water quality including setting voluntary control standards that are even more stringent than laws and regulations.

In FY2018, we positioned 22 “water-quality” challenge-focused plants in three regions where water discharge is released into rivers for implementing measures intended to achieve the Challenge goals, taking into consideration the local

impacts of Toyota’s water discharge. We will strive to reinforce water quality control even further by surveying water quality in the surrounding areas of the target plants and confirming the impact attributable to our water discharge.

#### Challenge-focused Regions

Water quality: Asia, North America, Europe  
(Water volume: Asia, North America, Southern Africa)



### Four Approaches to Water Purification

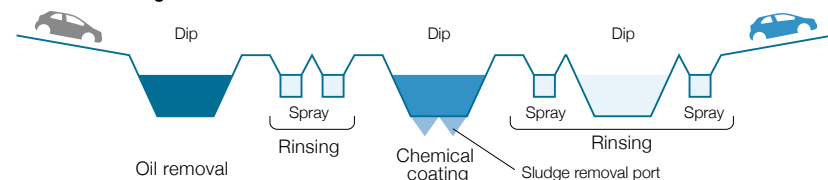
We take measures from four approaches in order to return clean water to rivers and other public waters.

#### A. Reduction of substances of concern

Chemical coating is performed as a vehicle body undercoat treatment. Until now, Toyota has developed technologies such as chemical coating agents compatible with bodies containing aluminum and steel as well as a nickel- and phosphorous-free treatment agent that reduces environmental impact.

By switching to processes that do not include materials that place a burden on the environment such as nickel, the impact on water quality has been reduced. It was first introduced in 2013 in conjunction with the retooling of production lines and was introduced in 2017 at the Tahara Plant, which produces the Land Cruiser and the Lexus LS, GS, and IS.

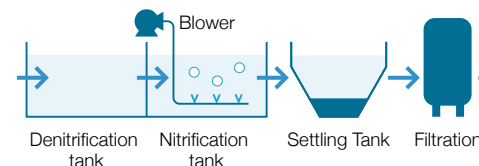
#### Automobile Painting Pre-treatment Process



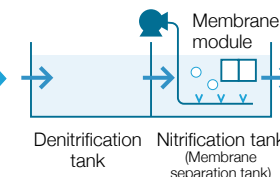
#### B. Proper treatment of wastewater

A Membrane Bioreactor system, an advanced treatment technology, was introduced to the wastewater treatment facilities at the Meiko Center and Kamigo Center. This treatment technology employs a membrane to separate sludge, reducing the release of sludge more than before and achieving stable treatment water quality.

##### Previous Method



##### Membrane Bioreactor system



Wastewater treatment facilities



Membrane module



Before treatment



After treatment

#### C. Water quality control

At wastewater treatment facilities, monitoring equipment continuously monitors the quality of treated water discharge and checks for any equipment abnormalities, and personnel conduct daily inspections. Workers conduct onsite inspections on a daily basis, checking color (oil films, turbidity), odor (oil contamination), sound (equipment operating status) etc.

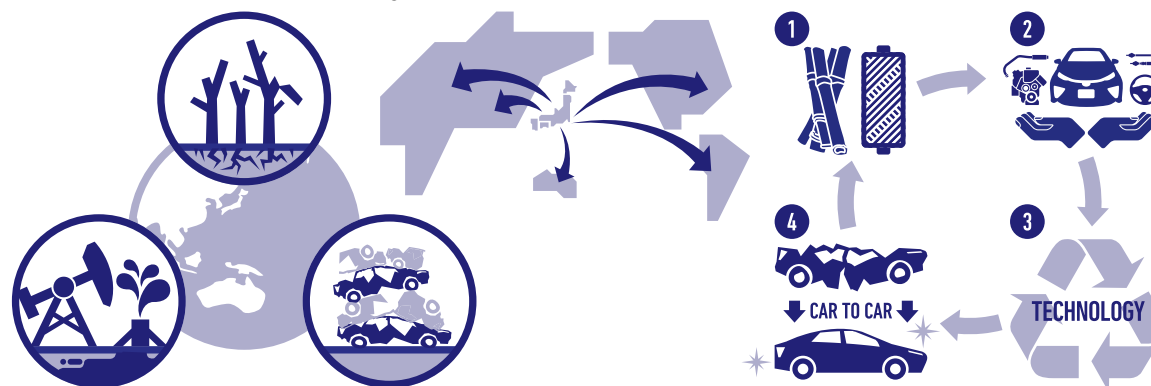
In addition, to ensure that there are no contaminants with pollutants due to accidents and so on in rainwater, which is normally clean and does not go through a water discharge treatment facility, water quality, analysis is periodically performed.

#### D. Prevention of leaks

We take measures to prevent leaks of contaminated water from plant sites even in the event of an accident including (1) creating ditches at plant entrances to prevent leaks, (2) installing pipes above ground so they can be examined for leaks, and (3) building dikes around oil and chemical tanks.

## Challenge 5 Challenge of Establishing a Recycling-based Society and Systems

**Fundamental Approach** Due to global population increase along with the pressure for economic growth and convenient lifestyles, the pace of resource consumption is accelerating. If large-scale exploitation continues as it is, natural resources will be depleted, and if waste increases due to mass consumption, appropriate disposal will be unable to keep pace, resulting in risks of environmental pollution. To prevent the environmental impact caused by End-of-life vehicles, Toyota launched the Toyota Global 100 Dismantlers Project, to establish social systems for End-of-life vehicle proper treatment. In order to realize an ideal resource-recycling based society, it is necessary to grasp the risks of resource depletion and the possibility of creating business opportunities, and initiatives are needed in four key areas: (1) use eco-friendly materials, (2) use auto parts longer, (3) develop recycling technologies, and (4) manufacture vehicles from End-of-life vehicles. Toyota aims to realize the ultimate recycling-based society, and promotes the Toyota Global Car-to-Car Recycle Project (TCCR) so that we can use resources from End-of-life vehicles for manufacturing new vehicles.



### Reduce Consumption of Dwindling Natural Resources Through Use of Renewable Resources and Recycled Materials

#### Reduce the Use of Petroleum-derived Plastics

Since the early 1990s, Toyota has been collecting and recycling bumpers replaced at dealers as a way to reduce the usage of petroleum-derived plastics. Some plastic parts collected from End-of-life vehicles were reused for energy as a heat source except using for used parts. Others were recycled into plastics for non-automobile use after going through a machine-automated sorting process.

In FY2018, we teamed up with dismantling companies to continue implementation of trial tests for collecting End-of-life vehicles-derived plastics, investigated the efficient removal of foreign substances, and undertook measures to create recycled materials that can be utilized in vehicles.

Amid the growing need to further promote plastic recycling, we will continue to study new technologies for collecting and recycling plastics from End-of-life vehicles to support sustainable economic growth globally.

#### Promote the Reuse of Rare Resources and Recycled Materials

Hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles, fuel cell electric vehicles, and other electrified vehicles use significant amounts of rare resources compared with conventional gasoline vehicles. Some of these resources often carry risks such as resource depletion or uneven supply among regions. In order to promote the reuse of resources and the adoption of recycled materials, we are collaborating with partner companies to establish a framework for collecting and recycling HEV batteries and automobile motor parts, along with cemented carbide tools used in production.

HEV batteries, for example, contain rare metals such as nickel and cobalt. Since launching the first-generation Prius in 1997, we have built our own recovery network to collect End-of-life HEV batteries for recycling and reuse. As of March 2018, we collected 98,700 End-of-life HEV batteries in total.

The collected batteries undergo inspection to determine which parts can be remanufactured into stationary storage batteries or vehicle replacement batteries. Parts not suitable for reuse are recycled as raw metal materials.

Toyota began recycling automobile motor magnets in 2012. As of March 2018, we collected a cumulative 35 tons of magnets, recycling rare earth.

For cemented carbide tools, we launched a system to extract and recycle tungsten<sup>1</sup> in 2010. As of March 2018, we recycled a cumulative total of approximately 170 tons of cemented carbide tools.

The use of Carbon Fiber Reinforced Plastics (CFRP) is expected to increase in the future to support the design of light-weight vehicles. We have made progress toward effective thermal recovery<sup>2</sup> for this material, and development of technologies for material recycling of waste CFRP is ongoing.

As electrified vehicles become further widespread, the amount of End-of-life parts, such as batteries and motors that contain rare resources, is expected to rise. We will continue material recycling activities for End-of-life parts and CFRP.

<sup>1</sup> Tungsten: Japan imports all of its demand for tungsten, which is used in the cutting edges of 80% of cemented carbide tools

<sup>2</sup> Thermal recovery: During the incineration of waste, thermal energy generated is recovered and reused

Cumulative amount of  
automobile motor  
magnets recycled

**35 tons**

Cumulative amount  
of End-of-life  
batteries collected

**98,700 units**



### Toyota Teams Up with Electric Power Company to Investigate Large-capacity Storage Batteries

Toyota and Chubu Electric Power Co., Inc. commenced verification project in FY2018 to construct a large-capacity storage battery system that reuses electrified vehicle batteries and recycle End-of-life batteries.

In the verification project, batteries collected from Toyota electrified vehicles that still have storage capacity will be reused in Chubu Electric Power's storage battery system. The objective is to use the batteries in meeting various challenges posed by the electric power system. When combined in large numbers, used batteries, even with reduced performance levels, can be repurposed for energy supply-demand adjustment, frequency fluctuation management, and voltage fluctuation management in distribution systems, all factors that accompany widespread introduction of renewable energy.

Based on the results of the verification tests, the two companies aim to introduce power generation capacity of approximately 10,000 kW, equivalent to 10,000 batteries, in FY2021. The batteries used will be nickel-metal hydride batteries, which are currently being used in large quantities, mainly in HEVs, with plans to also use lithium-ion batteries starting by around 2030.



### Toyota Develops Neodymium-reduced, Heat-resistant Magnet for Use in Motors, Can Reduce Neodymium Use up to 50 Percent

The magnets used in automobile motors and other components are powerful magnets that contain approximately 30 percent neodymium, a rare-earth element. The powerful neodymium magnets used in automotive and other applications must have high coercivity even at high temperatures. As a result, in addition to neodymium, which is produced in relatively high volumes, rare-metal elements like terbium (Tb) or dysprosium (Dy) are also added. Rare earth elements range from the plentiful and inexpensive to the scarce, but the rare earth elements used to enable magnets to be employed at high temperatures are expensive rare metals with high geopolitical risks. To address this, considerable efforts have been made to develop magnets that do not use these metals and positive results have been achieved. In contrast to this, production volumes of neodymium are relatively high, so there have been few such initiatives, but there are concerns that the supply and demand balance may break down as electrified vehicles become increasingly popular in the future.

The newly-developed magnets do not use scarce rare metals and replace a portion of the neodymium with low-cost and abundant rare earth elements, thereby reducing the amount of neodymium used in the magnet. In addition, new technology that can suppress the deterioration of coercivity and heat resistance was developed so that there is no loss of performance in motors at high temperatures as a result of the replacement of the neodymium. The same heat resistant performance as earlier neodymium magnets is achieved, while reducing the amount of neodymium used by up to 50 percent.

This new type of magnet is expected to be useful in expanding use of motors in various areas such as automobiles and robotics, as well as maintaining a balance between the supply and demand of valuable rare earth resources. Development of elemental technologies for motors, inverters, batteries, and other components will require steady research and development in anticipation of the future. Toyota positions these technologies as essential for electrified vehicles and will continue making steady progress in each and every area, while working to build the foundation that will support the increased use of electrified vehicles in the future.



Motor



Magnet

## Achieve Industry-leading Levels in Easy-to-dismantle Design for Effective Resource Recycling

To promote material recycling of End-of-life vehicles, Toyota directly visits dismantling companies in Japan and overseas to investigate actual conditions and gain insight into the development of vehicle structure that make it easy to dismantle and separate parts. We have actively adopted these designs for new models since 2003 with the launch of the Raum passenger car.

The new Camry, JPN TAXI and Lexus LS unveiled in FY2018 adopt the Toyota New Global Architecture

(TNGA)<sup>1</sup>, a new concept for car manufacturing which ensures superior stability and control along with a comfortable ride with minimal vibration and sway. These vehicles continue to incorporate easy-to-dismantle designs to ensure safe and speedy dismantling operations.

In other areas where we adopt new structures, parts, and other technologies, we will continue to ensure easy-to-dismantle designs in order to maintain and enhance the capability to dismantle vehicles.

<sup>1</sup> TNGA: Toyota's company-wide global initiative to structurally transform automobile design. TNGA aims to dramatically improve the basic performance and marketability of Toyota vehicles by reforming and integrally redeveloping powertrain components and platforms.

### Vehicle Structure for Easy Dismantling

#### Removal of heavy battery components from hybrid electric vehicle

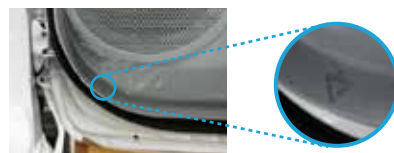
Component removal times for the Prius are further reduced. The new easy-to-dismantle mark has been added to assist in hoisting heavy components with good balance.



#### Removal of door trim<sup>2</sup>

The easy-to-dismantle mark indicates places where the load required for removing the door trim is 30 percent less than usual.

<sup>2</sup> Door trim: The panels lining the inner part of the door

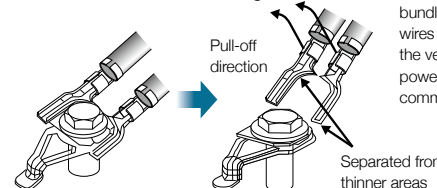


#### Wiring harness<sup>3</sup>

##### Use of pull-tab type ground terminal for wiring harness

Assembled condition

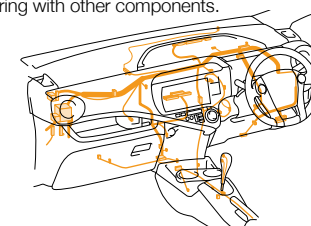
During dismantled



<sup>3</sup> Wiring harness: A bundled assembly of wires running throughout the vehicle body for power supply and signal communications

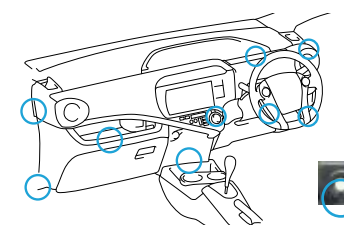
#### Wiring harness layout innovation

The wiring harness can be stripped out without interfering with other components.



#### Removal of instrument panel

The positioning of the V-grooves makes it easy to remove the instrument panel by pulling it strongly.



#### Use of "Easy-to-dismantle mark"

"Easy-to-dismantle marks" are added to show key points for disassembly tasks





## Contribute Worldwide Through Appropriate End-of-life Vehicle Treatment and Recycling Technology Developed in Japan

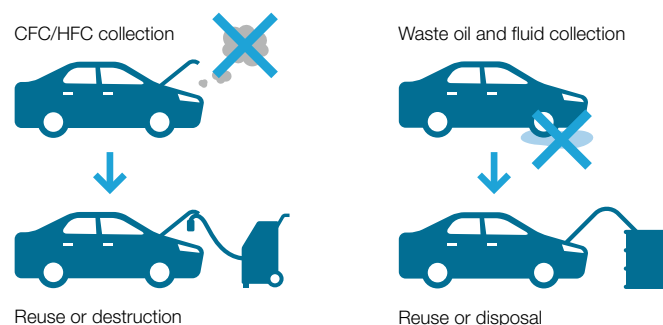
When End-of-life vehicles are not properly disposed or dismantled, this may not only affect regional environments, but also cause risks to the health and safety of local residents. To prevent these problems, we promote the Toyota Global 100 Dismantlers Project. Through this project, we aim to establish social systems for properly treating End-of-life vehicles without imposing regional environmental impact. Our long-established End-of-life vehicle dismantling technologies and know-how contribute to the establishment of social systems.

In FY2018, we prepared a manual on proper dismantling of End-of-life vehicles and a video manual on airbags deployment for countries and regions that lack suitable dismantling facilities. Responses to the regulation on proper End-of-life vehicle recycling in Vietnam were completed, and a model facility for proper End-of-life vehicle dismantling was established in Thailand.

We have been constantly researching the flow of End-of-life vehicles and setting an each target level according to the conditions of regional infrastructure in cooperation with local affiliates.

We will strive to establish recycling-based societies with proper treatment of waste oil, fluids, CFC/HFC gas and efficient resource recycling by expanding the Toyota Global 100 Dismantlers Project gradually.

### Image of Appropriate End-of-life Vehicle Treatment



### Establishment of Vehicle Dismantling Facility as a Model for Southeast Asia (Thailand)

Green Metals (Thailand) Co., Ltd., an affiliate of Toyota Tsusho Corporation, established a model End-of-life vehicle dismantling facility on its site in March 2018. This is the first model facility in Southeast Asia supporting the Toyota Global 100 Dismantlers Project, following a facility established in Beijing, China.

Infrastructure for the proper treatment of End-of-life vehicles has not been established in Thailand, and operations that have negative impacts on the environment such as dumping waste oil and fluids and releasing CFC/HFC gas into the atmosphere are conducted. The establishment of the model End-of-life vehicle dismantling facility is an effort to prevent water and soil contamination through the proper treatment of waste oil and fluids and prevent global warming through collection and destructive processing\* of CFC/HFC gas.

Thailand does not have a legal system regarding End-of-life vehicles such as Japan's End-of-Life Vehicle Recycling Law, and Toyota, TDEM, which is the Asian regional headquarters, and TMT, an affiliate in Thailand, are cooperating with the Pollution Control Department of the Ministry of Natural Resources and Environment, the Department of Industrial Works of the Ministry of Industry, and the Industrial Estate Authority of Thailand to design systems for the proper treatment of End-of-life vehicles. Through these efforts, the entire Group is working together and taking the initiative regarding the proper treatment of End-of-life vehicles.

\* Thermal treatment by Bangpoo Environmental Complex (operated by Waste Management Siam Ltd., an affiliate of Dowaco System Co., Ltd.)



Model End-of-life vehicle dismantling facility





## Expand Original Recycling Systems for End-of-life Vehicles Worldwide

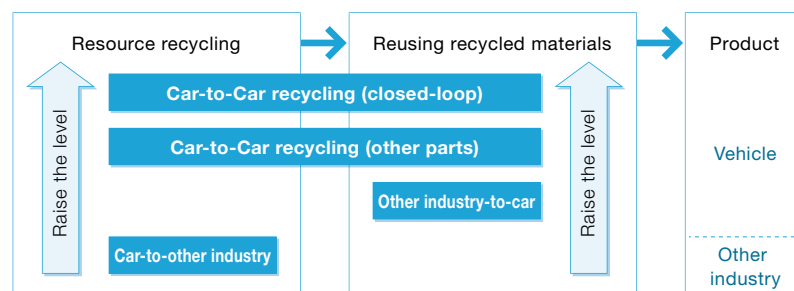
In order to realize an ultimate recycling-based society, we promote the Toyota Car-to-Car Recycle Project (TCCR) that is based on the concepts of reduce, reuse, and recycle, aiming specifically at elimination of resource-related risks and global warming.

In FY2018, we conducted trials with a model in Japan as a blueprint toward the establishment of a global recycling-based society. We are identifying issues for the creation of optimal social systems in 2030.

Batteries for HEVs are expected to increase overseas in the future, and in FY2018, we started initiatives to globalize battery recycling systems, establishing collection and recycling schemes in each region.

The ultimate goal of this project is closed-loop recycling, the concept that the vehicles parts and materials are recycled into identical parts. We will continue promoting “Car-to-Car Recycling” through gradual progress in both aspects of this system, namely the first phase of resource recycling in which vehicle parts and materials are turned into raw materials for new parts, and the second phase of fully reusing recycled materials in new vehicles.

### Image of “Car-to-Car Recycling”



## Reduce Waste and Use Resources Efficiently in Production Activities

Toyota strives to reduce the volume of waste from production activities by developing and deploying new production technologies while taking continual daily measures in terms of the sources of waste (design and production method innovations), resource recycling, resulting cost reductions, and so forth.

In FY2018, Toyota Motor Corporation (TMC) continued waste reduction activities through improvement measures such as sludge volume reduction. The total waste volume, as a result, was 32.7 thousand tons

(down 3.3 percent year on year), and the waste volume per unit produced was 11.3 kg (down 3.1 percent year on year).

Globally, Toyota continuously undertook waste reduction measures and made efforts that lead to cost reductions. Due to changes in the recycling market, however, a shift from selling recycling materials as valuable goods to paying for recycling and so on, the total volume of waste was 499 thousand tons (up 5.3 percent year on year), and the waste volume per unit produced was 47.4 kg (up 5.4 percent year on year).

### Trends in Total Waste Volume and Waste Volume per Unit Produced at TMC (Japan)

[Third-Party Assurance](#)

	FY	2014	2015	2016	2017	2018
Total waste volume (thousand tons)		36.0	35.9	35.2	33.8	<b>32.7</b>
Waste volume per unit produced (kg/unit)		12.4	12.5	12.5	11.6	<b>11.3</b>

- Scope of coverage: Production and non-production divisions (excluding employee benefit facilities)
- The total waste volume in production divisions consists of waste generated through production activities
- Waste volume: Waste at cost + incineration + landfill

[Environmental Data p. 62-M](#)

### Trends in Global Total Waste Volumes and Waste Volume per Unit Produced

[Third-Party Assurance](#)

	FY	2014	2015	2016	2017	2018
Total waste volume (thousand tons)						
Japan (TMC)		36	36	35	34	<b>33</b>
Japan (consolidated EMS and its subsidiaries)		365	353	348	359	<b>383</b>
North America		32	29	29	30	<b>29</b>
China		20	17	17	17	<b>18</b>
Europe		14	14	11	12	<b>14</b>
Asia (excluding Japan), Australia, Middle East, South Africa, Latin America		27	26	21	22	<b>22</b>
Total		494	475	461	474	<b>499</b>
Waste volume per unit (kg/unit)		47.7	46.0	45.3	45.0	<b>47.4</b>

- Scope of coverage: TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 121 companies

[Environmental Data p. 63-R](#)

- Waste volume: Waste at cost + incineration + landfill

[Environmental Data p. 62-N](#)

### Column Reducing Waste in C-HR Painting Process (Turkey)

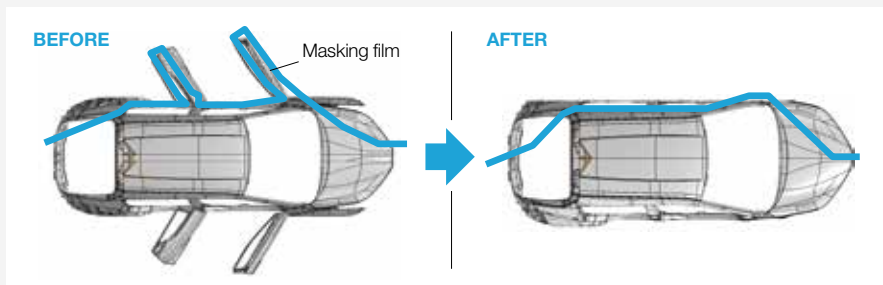
At TMMT, an affiliate in Turkey, the need to perform masking during the painting process arose in conjunction with the introduction of the two-tone C-HR, and the volume of used masking film waste increasing. To address this issue, the company investigated methods of winding the masking film that can maintain paint quality and managed to reduce the volume used through innovations. The amount used per vehicle produced was cut from 1,300 cm to 670 cm, and the labor time was also reduced. The amount of waste generated per vehicle produced was halved from 1,482 g to 723 g, resulting in a 39-ton decrease annually.

TMMT was also able to reduce the number of paint protection plastic caps used when painting bottom surface of vehicle by modifying the movement of painting robot sprayers.

The company also plans to address the reuse of masking film.



Commemorative tree-planting for winning the gold award of the Global ECO. Award by kaizen members



### Column Disposal Companies Reviewed and 100 Percent Battery Recycling Achieved (Argentina)

TASA, an affiliate in Argentina, used to sell approximately 45 tons of End-of-life industrial batteries to several disposal companies as hazardous waste each year. These disposal companies recycled the lead that comprises 65 percent of batteries, and, furthermore, TASA examined the processing methods, processing capacity, and so on of the disposal companies and re-selected the disposal companies that can recycle 100 percent.

## Reduce Packaging and Wrapping Materials and Use Resources Efficiently in Logistics Activities

Toyota Motor Corporation (TMC) is taking a broad range of initiatives to reduce the amount of packaging and wrapping materials used in logistics. These include increasing packaging efficiency in shipping containers, using returnable containers\* to reduce the amount of unrecyclable materials used, and making packaging and wrapping materials simplified and lighter.

In FY2018, TMC succeeded in reducing the amount of packaging and wrapping material per shipment unit to 6.21 kg/m<sup>3</sup> (down 9.6 percent year on year) by making packaging and wrapping materials smaller and adopting returnable shipping containers. The total volume of packaging and wrapping materials used amounted to 45.8 thousand tons (down 10.9 percent year on year).

Also, on a global basis, Toyota continued efforts to gather and share information on best practices at each affiliate.

Moving forward, we will promote the efficient use of resources when shipping goods, while striving to reduce the volume of packaging and wrapping materials.

\* Returnable: To enable used packaging materials to be returned to original shipping points for reuse

### Trends in Usage of Packaging/Wrapping Materials at TMC (Japan) and Packaging/Wrapping Materials per Shipment Unit at TMC (Japan)

	FY	2014	2015	2016	2017	2018
Usage of packaging and wrapping materials (thousand tons)		56.3	51.7	50.9	51.4	<b>45.8</b>
Usage of packaging and wrapping materials per shipment unit (kg/m <sup>3</sup> )		6.97	6.98	7.36	6.87	<b>6.21</b>

### Results of Activities to Reduce Usage of Packaging/Wrapping Materials at TMC (FY2018, Japan)

Products	Main improvement activities	Reduction volume (thousand tons)
Production parts	Use of returnable containers, simplification of packaging specifications	0.4
Service parts	Use of returnable containers and lighter-weight packaging, reuse of packaging and cushioning materials, etc.	0.5
Total		0.9

## Challenge 6 Challenge of Establishing a Future Society in Harmony with Nature

**Fundamental Approach** It is critical for humans to conserve forests and other natural environments in all regions for coexistence in harmony with nature. However, deforestation is progressing across the world, resulting in the fragmentation of habitats of diverse species, as well as the continuing loss of biodiversity. This entails a number of issues including the loss of biological resources that are essential for society, causing natural disasters, and spurring global warming, and we believe that it poses a risk to the potential for the sustainability of society as a whole including Toyota. In light of this risk, Toyota launched three “connecting” projects and is taking action to expand activities various regions of Japan and overseas in order to “enrich the lives of communities” in each region. We will expand these activities at group, regional, and organizational levels using the insights we have gathered so far, aiming for a future where people and nature live in harmony.

- **Toyota Green Wave Project**  
Connecting Communities
- **Toyota Today for Tomorrow Project**  
Connecting with the World
- **Toyota ESD Project**  
Connecting to the Future



### Promote Expansion of Nature Conservation Activities Connecting Communities —Toyota Green Wave Project

Toyota Group companies have conducted afforestation activities at their respective plants and undertaken environmental conservation activities in their surrounding areas. The Toyota Green Wave Project is an initiative to connect regions through these diverse activities promoting harmony with nature. By extending Toyota Group activities to promote harmony with nature in Japan and overseas, we aim to expand natural habitats and help create a sustainable society, benefitting biodiversity. Specific programs include the Plant in Harmony with Nature Project, which creates environments that foster nature and living creatures, and the All-Toyota Green Wave Project, which fosters ties between local communities and the Group.

#### Evolution from “Afforestation Activities at Plants” to “Plant in Harmony with Nature”

Afforestation activities have been conducted since 2007 with the theme of creation of forests at plant sites. The Tsutsumi Plant, where the Prius is produced, serves as a model plant for this project.

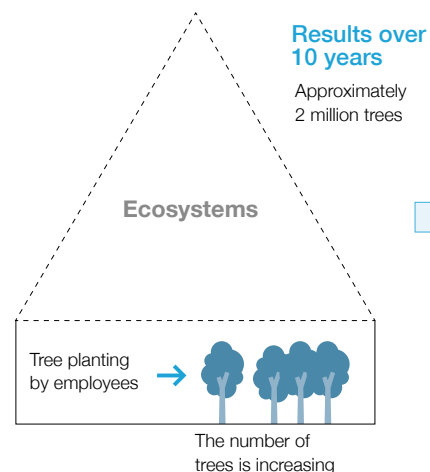
A recalculation of results from the past 10 years indicated that approximately 2 million trees have been planted in Japan and overseas, creating sites that foster nature and living creatures.

We expanded activities in FY2018, and in the future will carry out the Plant in Harmony with Nature Project. These activities are not limited to forest environments covering forests at plants, but are being expanded to cover the habitats of various living creatures. In addition, species that serve as indicators (indicator species) are selected to quantitatively assess ecosystems and are continuously monitored. The Plant in Harmony with Nature Project is being carried out by not only employees but also employees working under the guidance of local experts and in collaboration with local residents. Specific actions include periodically surveying indicator species according to the level in the ecosystem pyramid and reviews of activities based on the survey results. Continuation of these activities contributes to the preservation of regional biodiversity.

We expect that these activities will build and develop positive relationship between the plants and local ecosystems and promote good communications among employees and interaction with local communities.

## Plant in Harmony with Nature Project Leads the Way to the Better Environment

### Previously: Afforestation Activities at Plants



### Future: Plant in Harmony with Nature

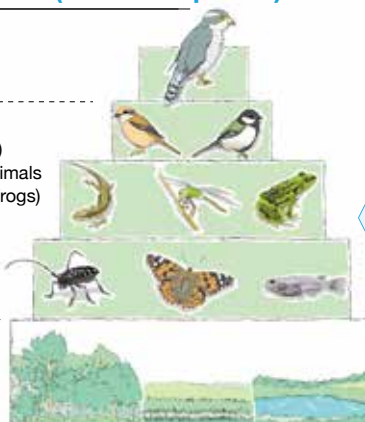
#### Living creatures (indicator species)

Result KPI  
(final target)

Process KPI  
(evaluate progress)  
Example: Small animals  
(birds, butterflies, frogs)

Review activities  
based on results

↑ ↓  
Maintaining and  
improving  
**habitats**



#### Employees

- Develop human skills in harmony with nature
- Enhance communications among employees

#### Local residents

- Develop biodiversity education
- Promote regional interaction

#### Local experts

- Select indicator species
- Assess ecosystem status



Plant employees conduct surveys of living creatures



### Toyota Facilities Win Japan Greenery Research and Development Center Chairman's Award

The Kinuura Plant and Tajimi Service Center won the Japan Greenery Research and Development Center Chairman's Award at the 36th National Factory Greenery Promotion Conference. The award is presented to plants, organizations, and individuals that promoted afforestation at plants and made significant contributions to improving the environment in and around plants. The aim is to encourage further afforestation at plants.

The Kinuura Plant manufactures transmissions and other drive-related components. Since 2008, the plant has been conducting environment classes at an on-site biotope for all second grade elementary school student in Hekinan City, Aichi Prefecture. In addition, approximately 5,000 trees were planted since 2010 as a part of afforestation activities.

The Tajimi Service Center was established in 2013 to train dealer staff in Japan and overseas and for other purposes. When the facility was constructed, harmony with the local environment and restoration of forested areas that had been lost to former clay mining sites were raised as issues. The site was divided into six zones and activities are being carried out with the aim of restoring the forested areas with a focus on species native to Tajimi City. In line with this concept, approximately 1,100 trees were planted in 2013 as an afforestation project.

Toyota will continue to undertake plant afforestation with the aim of maintaining and improving the habitat environments of living creatures in order to create a plant that makes use of and is in harmony with nature.



The Kinuura Nature Observation Park, a biotope at the Kinuura Plant



The biodiversity zone at the Tajimi Service Center



### All-Toyota Harmony with Nature Working Group Activities: All-Toyota Green Wave Project

Toyota Green Wave Project Working Groups were established by 23 affiliated companies in May 2015 to expand activities in harmony with nature, enhance the dissemination of information, and strengthen cooperation by participating companies.

In FY2018, individual companies in Japan expanded the types of activities and steadily progressed by undertaking 217 projects, 1.8 times more than in FY2017. In addition, collaborative activities or All-Toyota unified activities were conducted. In May 2017, 30 employees from 18 companies participated in a tree planting festival held at Millennium Hope Hill in the Tohoku region. In October 2017, bamboo forest maintenance was performed at the Yahagi River with the participation of 54 employees from 18 companies. Due to these activities, river-based activities have been added to ongoing forest maintenance and estuary cleanup programs, establishing a new “connecting” activity that links living creature preservation in different river zones of forest, river, and ocean.

In the future, the activity areas of All-Toyota programs will be expanded and “connecting” activities will be undertaken such as preserving living creatures that is common to multiple areas.



The fourth “Connecting” Activity: The Millennium Hope Hill Tree Planting Event in Tohoku



The fifth “Connecting” Activity: Logging of Yahagi River bamboo forest

#### All-Toyota Harmony with Nature Working Group Activities

	FY2017	FY2018	Two-year total	2006–2018 total
Number of participants (persons)	41,118	47,440	88,558	
Number of trees planted	31,089	27,645	58,734	12,158,734
Conservation target forests (ha)	1,798	3,019	4,817	
Environmental education (participants)	26,486	32,302	58,788	

#### Booklet Published and Website Created

The All-Toyota Green Wave Project volume 2 was published following volume 1 published in 2016 and distributed to employees throughout the Toyota Group. As a result of this activity, it was found from an

employee questionnaire that the recognition of biodiversity reached 81 percent. Starting in June 2018, which was Toyota Environment Month, in addition to distribution of the booklet (volume 3), a dedicated website was launched to disseminate information on the activities of each company in a timely manner. From now on, we will strengthen activity sharing so as to improve the degree of recognition in each company.



Dedicated website



#### Little Tern Conservation Project in Kinuura Bay

Toyota Motor Corporation, JTEKT Corporation, and Toyota Industries Corporation, which have plants in the Kinuura region, collaborated and launched a program to protect the little tern.

The little tern is a migratory bird that spends spring and summer in Japan to breed and raise its young. In the past, they were common birds, but more recently, their breeding environment has diminished and they are at risk of extinction (the little tern is classified on the Red List of Ministry of the Environment of Japan as a Category II (Vulnerable) and as Category I B (Endangered) on the Red List Aichi 2015).

The three Toyota Group companies are collaborating with Nishimikawa Bird Club and we are carrying out conservation activities for coastal biodiversity with a focus on the nesting environments of little terns. Nesting area development and attraction activities began at the JTEKT Tadomisaki Plant in the winter of 2015. Nesting area development on idle land began at the Kinuura Plant in 2017, and Toyota Industries Corporation participated in 2018.

In FY2017 decoys were installed, CDs of the birds' cries were played, and other activities were conducted at the Kinuura Plant. It was confirmed that little terns flew into the area, but unfortunately, they did not build nests. Starting in March 2018, employees created gravel beds, drinking locations, and hiding spots for chicks and conducted other activities to improve the nesting environment and set additional decoys to attract more birds. As a result, birds built nests and laid eggs, and the chicks are now steadily growing as of July 2018.



Little terns (the two on the left) and decoys (two on the right)



Parent and chick little terns

## Boost Grant for Environmental Activities Connecting with the World —Toyota Today for Tomorrow Project

Toyota has conducted cooperative activities in Japan and overseas with environmental NGOs including the Toyota Environmental Activities Grant Program and afforestation programs in China and the Philippines. We have established Toyota Today for Tomorrow Project to bolster our long-standing grant program on a global basis. With the aim of contributing to society, we will work together with organizations engaged in nature conservation around the world by establishing projects to solve issues in the areas of living in harmony with nature and biodiversity.

### Launch a Five-year Partnership with WWF on Living Asian Forest Project

In July 2016, Toyota entered into a five-year partnership with WWF (World Wide Fund for Nature) aiming at accelerating the globe's transition to sustainability. Toyota is the first car company and the first Japanese company to sign a Global Corporate Partnership agreement with WWF.

To promote biodiversity conservation under the partnership, Toyota has made annual 1 million US dollar grants to WWF since 2016 to support the Living Asian Forest Project. The Living Asian Forest Project aims to strengthen existing WWF activities to conserve tropical forests and wildlife in Southeast Asia and launch new conservation initiatives.



■ FY2018 Activities (1): In July 2017, a WWF seminar on sustainable natural rubber production and procurement was held in Japan as an educational event. With the expectation that providing information on conditions at natural rubber production sites and conveying local opinions to involved people will expand the movement for sustainable natural rubber, relevant people were urged to participate in. Numerous participants from Japanese tire makers as well as locals from Thailand, Indonesia, and Myanmar discussed the current conditions of natural rubber production. Also, a tire maker from Europe, whose procurement guidelines on natural rubber were issued at an early stage, presented information on examples of applications that improve traceability in the natural rubber supply chain.

### Comment from WWF Thailand

- There is a correlation between the loss of forests in Thailand and the increase in land area used for natural rubber plantations
- Ninety percent of natural rubber farmers (1.4 million households) are small-scale farmers with an average land area of 4 ha

### Comment from WWF Myanmar

- There are many issues including low quality, low productivity, and low added value
- There has been some movement by the government including the announcement of zero deforestation, but the instability of the government is proving to be a bottleneck

### Comment from WWF Indonesia

- Most deforestation is illegal, and much of it is for production of palm oil and other products



Rubber is produced by making a cut near the surface of a rubber tree using a knife or other tool, collecting the white sap that seeps out, and solidifying and processing it



Orangutans are endangered due to the rapid loss of forests

■ FY2018 Activities (2): A website for the Living Asian Forest Project in both Japanese and English was launched in November 2017. The site introduces a summary of the project as well as information on recent activities, plants and animals inhabiting the living Asian forests.



It is believed that there are no more than 100 Sumatran rhinoceroses



A veterinarian cares for eight elephants that are part of a patrol team



## Toyota Collaborates with IUCN to Enhance Data on Biodiversity Preservation Status

Toyota began a five-year partnership with International Union for Conservation of Nature (IUCN)<sup>1</sup> in May 2016 to raise awareness of the biodiversity crisis. Under the partnership, we provide annual grants of approximately 1.2 million dollars and began supporting the IUCN to enrich the IUCN Red List of Threatened Species™ (the IUCN Red List)<sup>2</sup>. With this support, the IUCN will conduct assessments of more than 28,000 species at risk of extinction, accounting for 35 percent of species requiring assessment. This represents a major step forward in the IUCN's goal of gaining a comprehensive view of the conservation status of biodiversity on the Earth.

<sup>1</sup> IUCN: Founded in 1948 through an international initiative, International Union for Conservation of Nature is a global nature conservation network comprising nations, government agencies, and non-governmental organizations

<sup>2</sup> IUCN Red List: The IUCN Red List of Threatened Species™ (IUCN Red List) is a list of threatened species in the world managed by the international organization IUCN

■ FY2018 Activities (1): We jointly organized an event held in Bangkok, Thailand in May 2017 with IUCN to raise awareness of biodiversity and the IUCN Red List in Thailand. Various stakeholders including officials from the Thai government, university academics, students, and NGOs participated. Representatives from each sector gave speeches in which they expressed hope that activities will be expanded through collaboration between the public and private sectors, welcomed the participation of persons of like mind, and conveyed their wishes for increasing such persons in the future. The participants emphasized the importance of cooperation in undertaking conservation activities.

■ FY2018 Activities (2): The IUCN released the latest version of its IUCN Red List at an event held in December 2017. Forty-six species of snakes and lizards endemic to Japan were newly assessed, and it was indicated that 15 species of reptile including snakes and lizards that inhabit the Nansei Islands are endangered. During a panel discussion at the event, Toyota highlighted that the IUCN Red List is an important pillar of Challenge 6.

■ FY2018 Activities (3): Environmental NGOs BirdLife International (BLI) and Conservation International (CI) conduct IUCN Red List surveys and preservation activities. Toyota has been supporting activities for the Red List and has provided vehicles to the two organizations since 2016. Based on local needs, in FY2017, Toyota made donations to BLI in Vietnam and Brazil and to CI in Indonesia and Brazil, supporting local surveys.



Local use of Toyota vehicles

## Toyota Environmental Activities Grant Program

In 1999, Toyota was honored with the Global 500 Award from the United Nations Environment Programme (UNEP). To commemorate receipt of this award, in FY2001, we launched the Toyota Environmental Activities Grant Program to support the environmental activities of NPOs and other groups. The main themes of the grant program are biodiversity and climate change. Grants are offered to support overseas projects (up to seven million yen per project) and projects in Japan (up to three million yen or one million yen per project).

Over the 18 years since the program was established, we have supported 360 projects in 53 countries and regions worldwide.

[Environmental Data p. 62-0](#)

■ FY2018 Activities (Domestic project): One domestic project supported a nature club that seeks to foster the specialists of the future and utilize local capabilities to protect wildlife. The event, conducted by the Wildlife Partnership Office, includes nature courses for children, small groups, and lifelong learning and target elementary school children. Its objectives are to promote education on living creatures management that takes into consideration preservation of biodiversity and to foster local leaders.

The event specializes in wildlife management training and enables participants to learn local, environment, experiencing techniques on the university level. Inquiries from non-local administrative officials, NPOs, and companies, with which there were no prior ties have increased and networks are expanding, leading to new activities.



Children participating in the program and university students participating as interns

■ FY2018 Activities (Overseas project): For one overseas project, the Organization for Industrial Spiritual and Cultural Advancement International (OISCA) is carrying out the Children's Forest Program in Sri Lanka to create plant nurseries and conduct environmental education. It aims to protect and nurture areas in an attempt to revitalize the local original biodiversity and to rebuild affluent lives in harmony with nature. The program provides practical training on tree planting starting with growing saplings mostly by younger generation, and environmental education. Before trees are planted, local residents cooperate with ground preparation and hole digging, and the wholehearted efforts of the children inspire the adults, leading to the development of activities that involve entire regions, and there have been reports of the expansion of voluntary activities as well.



Trees are planted with a focus on native species

## Boost Contributions to Environmental Education Connecting to the Future — Toyota ESD Project

Human resources development is crucial for expanding environmental conservation activities to the future. Consequently, the Toyota Education for Sustainable Development Project promotes sustainable human resource development suited to local communities. Our corporate training approach is to nurture environmentally conscious employees and leverage their awareness to make it better for business. Additionally, we are connecting our training activities to the future by making the best use of the features of business sites and company-owned fields to provide environmental education for children, who will be responsible for sustainable societies in the future.

### Toyota Shirakawa-Go Eco-Institute

Toyota Shirakawa-Go Eco-Institute, located at the Shirakawa-Go world heritage site, opened in 2005 with the goal of widely promoting locally rooted environmental education valuing nature's inherent wisdom. The concept of "living in harmony" is central to the Institute, which is located in rich nature at the foot of Hakusan (Mt. Haku), and which provides many adults and children visiting Shirakawa-Go with hands-on nature programs as well as working on ecosystem surveys of wildlife, along with forest conservation activities. In 2015, to commemorate the institute's 10th anniversary, we enhanced the hands-on nature programs under the slogan, "Trail walking for adults. Forest play helps kids grow stronger." The Institute aims to provide opportunities and education to enable individuals to understand and take action on their own initiative through shared education that enhances growing and learning together toward living in harmony with nature. There is a special emphasis on "children's camp" that nurtures children's environmental awareness, self-reliance, and ability to take action.

In FY2017, the Old-Growth Forest Insect Survey Camp and Hakusan Outdoor Journey camp programs for junior high school students were added. A total of eight camp programs were conducted, drawing 353 participants. The total number of people staying overnight at Shirakawa-Go in FY2018 was 16,718, and 13,046 people participated in institute programs during the year. Since opening in 2005, the institute has welcomed more than 209,000 visitors.

Toyota Shirakawa-Go Eco-Institute will continue to develop new hands-on nature programs to nurture an awareness of living in harmony with nature among a growing number of adults and children.



Children participating in the Hakusan Outdoor Journey program

### Forest of Toyota

Forest of Toyota in Toyota City is a company-owned forest near the urban areas. It has been maintained based on the environment of satoyama, which was once part of our lives, creating a forest where living creatures can naturally inhabit.

Since 1997, the forest has been open to the public. Anyone can walk freely through the forest and take part in various events to experience the satoyama environment and learn about nature through their five senses. In 2017, we celebrated 20 years since the forest opened to the public. Since 2001, we have also provided hands-on learning events for regional elementary schoolchildren. In 2017, these events were attended by 5,538 children.

#### ■ FY2018 Activities: Nationwide Dragonfly Park Project

In June 2017, we held the "Future of Harmony between People and Nature as Learned from Dragonflies" event, the second in a series held to learn about the ecology of living creatures of satoyama. Dragonflies are familiar creatures that make use of the waterside environments that people create in their lives. By learning about dragonfly ecology and habitats, we considered the importance of biodiversity and human living in harmony with nature. An expert discussed the causes of decreases in dragonfly populations. They presented research results such as new findings on the ecology of dragonflies and efforts to expand paddies using reduced agricultural chemicals to preserve dragonflies.

During a field tour to the Forest of Toyota, participants observed dragonfly nymphs living in the soil, the smallest dragonfly in Japan. Information was also presented on methods of developing water environments that are employed on a daily basis in the Forest of Toyota.

Finally, the participants discussed methods of environmental preservation that they can undertake. One participant commented, "I hope to create biotopes that take living creatures into consideration and conduct environmental education for children that conveys the interesting ecology of dragonflies." We will continue to conduct environmental education programs that use dragonflies as inspiration to learn about nature in our immediate surroundings and lead to action.



An observation tour



The scarlet dwarf is about 2 centimeters long

## Promoting Environmental Contributions Through Biotechnology and Afforestation Business, Automotive Peripheral Technologies, and Forest Conservation Activities

### Cooperation with Preservation of Peat Swamp Forests in Indonesia

Indonesia is the third largest emitter of CO<sub>2</sub> in the world when forest fires, peat fires, and other factors are included. Emissions from peat as a result of peat fires and other causes account for 37 percent of the total, equal to more than half of the total CO<sub>2</sub> emissions in Japan. On the other hand, preserved peat swamp forests are not only carbon sinks, but are an important habitat for species at risk of extinction including the orangutan and proboscis monkey. In order to preserve swamp forests and prevent CO<sub>2</sub> release, in addition to fire prevention and monitoring activities, we are carrying out activities to prevent the depletion of forest resources by supporting the economic independence of local residents in the Katingan region of central Kalimantan.

As part of the support activities, Toyota has brought in an improved fast-growing Napier grass in rural villages where beef cattle are raised and began on-site cultivation tests in 2016. The tests verified that the Napier grass produces yields that are more than double those of the varieties grown locally. We also confirmed that not only can the tips of the Napier grass be used as forage grass, but the lower portion of the stems can be used as a source of fuel as an alternative fuel and as biogas. Utilization of this developed variety of Napier grass is expected to support economic independence by local residents and lead to preservation of peat swamp forests.

In the future, we will confirm the effectiveness of selected developed varieties and cooperate with local companies to verify effectiveness on a practical scale such as expanding self-sustaining models to other rural villages.



Program participants with Napier grass three months after cultivation



A Napier grass cultivation test

### TOYOTA Mie Miyagawa Mountain Forest

To its own forest site in Odai Town, Taki District of Mie Prefecture, Toyota has introduced automobile manufacturing expertise for management, such as soil and water conservation\* and providing other functions which benefit the public. We are also conducting programs to learn about forestry and the deep relationship between the forest and human beings fully using the nature properties of Miyagawa region which has the history of timber industry.

In FY2018, we started a new project, the Forest Challenge and Development, aiming for connecting forests with future generations. Taking on a challenge for utilization of trees and spaces as well as lumber production, business plans were collected widely from the public. Also, three participants selected through a screening implemented forest-based programs starting in April 2018. To raise awareness of some wisdom from forests and trees as well as promote the use of wood, we planned workshops to produce sculpted furniture and day-to-day goods made of wood with good designs.

We are also planning events that will enable more people to enjoy maintained mountain forests.

We will continue to invigorate local communities and forests by increasing the number of people involved with forests.

\* Water conservation: The ground penetration and storage of rainwater that slowly flows as underground water and rivers



The Forest Challenge



A hands-on forest program (a walk-through a 100-year forest)



## Initiatives at the New Toyota R&D Center Promoting Harmony with Nature and Local Communities

Toyota is constructing a new research and development facility in the overlapping area of Toyota City and Okazaki City. This new facility will be a hub for development of sustainable next-generation mobility. The main design concept is a technical center in harmony with nature and local communities. About 60 percent of the total project site will be preserved as areas for the regeneration of forests and management of yatsuda rice paddies (paddies in low-lying areas) in collaboration with the local community. Toyota is also actively sharing information including the status of these activities and findings gained from them.



Overall diagram of the new Toyota R&D Center



The Japanese pond frog is an important species for the regeneration of yatsuda paddies

### ■ FY2018 Activities (1): Acorn tree planting activity at business site

In June 2017, Toyota held a tree planting activity with the participation of 90 prefectural and municipal personnel and others local concerned persons including fifth and sixth grade students and teachers from the Hanayama, Tomoegaoka, and Onuma Elementary Schools in Toyota City and the Shimoyama Elementary School in Okazaki City. The saplings, grown at elementary schools in milk packs, were raised from konara oak and Japanese blue oak acorns collected on the business site. On the day of the event, a total of 600 saplings were planted. By growing saplings from collected acorns and returning them to the mountain, we are preserving acorn mountain. The Karen Forest Development Promotion Association, a member organization of the Shimoyama Satoyama Conference, plays a central role in this program, and Toyota employees participate as volunteers each year. We will continue to support local proactive activities that lead to the preservation of Satoyama and will take measures to make the new R&D facility a sustainable technical center in harmony with nature and local communities.



Children planting saplings grown from acorns



Personnel from schools, local government, and the local community at the tree-planting event

### ■ FY2018 Activities (2):

#### Rice paddy living creatures survey team

In July 2017, we conducted a survey of the living creatures in rice paddies. We used landing nets and plastic bottle traps to capture living creatures in three kinds of waterside areas with different environmental conditions: rice paddies (with agricultural chemical use), biotope (without agricultural chemical use), and waterways. We examined the species and numbers living in each environment and compared the differences. Participants learned from explanation by an expert that there is a relationship between the living creatures living in rice paddies and surrounding forests, and when living creatures decrease due to changes in the environment, food chains collapse, and ultimately there is an impact on human food supplies.



Observation of captured living creatures



Explanation by an expert

#### Bamboo charcoal making and searching for spring living creatures in satoyama

In March 2018, we conducted a program on making charcoal from bamboo and searching for spring living creatures in satoyama. The objective was to inform participants about earlier lifestyles in satoyama, which used natural resources cyclically, and raise awareness about current satoyama issues. Members of the Nukata Charcoal Making Group, a member organization of the Shimoyama Satoyama Conference, demonstrated bamboo charcoal making techniques using pail cans and discussed uses for charcoal in daily life. Participants learned about damage caused by animals and one of the solutions is to hunt and eat. They tasted a lunch of wild boar stew prepared by local mothers. During the search for living creatures, participants learned about the various environments of satoyama and the many creatures inhabiting them by finding signs of living creatures in forests and grasslands, and observing egg masses of montane brown frogs in rice paddies.



Bamboo charcoal making using pail cans



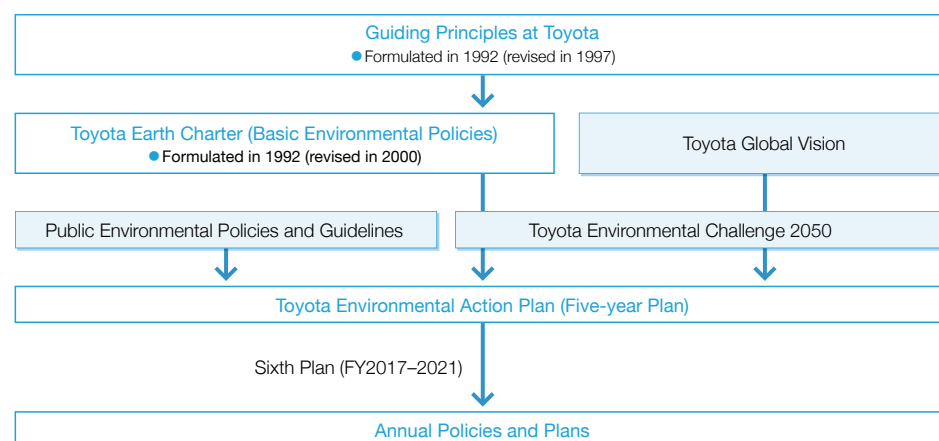
Observing montane brown frog egg masses

## Environmental Management

**Fundamental Approach** Toyota's environmental philosophy and policies are based on the Guiding Principles at Toyota established in 1992 (revised in 1997). Policies for environmental initiatives were formulated in 1992 as the Toyota Earth Charter (revised in 2000). This Charter is shared among 671 Toyota affiliates\* subject to the Consolidated Environmental Management System (consolidated EMS) around the world. The Toyota Global Vision announced in 2011 emphasizes the importance of "Respect for the Planet." Based on its philosophy and policies, Toyota formulated the Toyota Environmental Challenge 2050 in FY2016 as its first long-term vision for environmental initiatives. In FY2017, Toyota launched the Sixth Toyota Environmental Action Plan (FY2017–2021). Under this structure of environmental management system, Toyota is identifying environmental risks and opportunities that can affect business operations and is working for sustainable development in harmony with society toward the year 2050.

\* Since FY2017, in addition to the subsidiaries based on the formal standards, those based on the effective control standards have also been added due to the amendment of the Japanese Companies Act

### Structure of Toyota's Environmental Management System



### Toyota Earth Charter

#### I. Basic Policy

##### 1. Contribution toward a prosperous 21st century society

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.

##### 2. Pursuit of environmental technologies

Pursue all possible environmental technologies, developing and establishing new technologies to enable the environment and economy to coexist harmoniously.

##### 3. Voluntary actions

Develop a voluntary improvement plan, based on thorough preventive measures and compliance with laws, which addresses environmental issues on the global, national, and regional scales, and promotes continuous implementation.

##### 4. Working in cooperation with society

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.

#### II. Action Guidelines

##### 1. Always be concerned about the environment

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

##### 2. Business partners are partners in creating a better environment

Cooperate with associated companies.

##### 3. As a member of society

Actively participate in social actions.

- (1) Participate in the creation of a recycling-based society
- (2) Support government environmental policies
- (3) Contribute to non-profit activities

##### 4. Toward better understanding

Actively disclose information and promote environmental awareness.

#### III. Organization in Charge

Promotion by the Sustainability Meeting which consists of top management

Editorial Policy Contents Overview Highlights Message from the Head of the Company			Environmental Challenges Sixth Toyota Environmental Action Plan		Six Challenges Environmental Management	Environmental Data Third Party Assurance Report	
Challenge 1 New Vehicle Zero CO <sub>2</sub> Emissions Challenge	Challenge 2 Life Cycle Zero CO <sub>2</sub> Emissions Challenge	Challenge 3 Plant Zero CO <sub>2</sub> Emissions Challenge	Toward Realizing a Decarbonized Society in 2050	Challenge 4 Challenge of Minimizing and Optimizing Water Usage	Challenge 5 Challenge of Establishing a Recycling-based Society and Systems	Challenge 6 Challenge of Establishing a Future Society in Harmony with Nature	Environmental Management

Promotion Structure

Toyota Motor Corporation (TMC) holds Sustainability Meetings to deliberate on and make determinations regarding key issues such as corporate governance and risk management and responses. Deliberations on environment-related risks and opportunities and measures to address them are also conducted at the same meeting and by the ESG Committee, an affiliate organization. In addition, TMC has three core environment-related committees: the Environmental Product Design Assessment Committee, the Production Environment Committee, and the Resource Recycling Committee. These committees consider issues and responses, and all relevant divisions work together to carry out company-wide initiatives. Environment Committees have been established in six regions around the world where Toyota operates business (Europe, China, North America, Africa, Asia and Oceania, and South America). These committees steadily promote environmental initiatives and enhance our global responses. In Japan, the All-Toyota Production Environment Conference, the All-Toyota Production Environment Meeting, and the All-Toyota Logistics Environment Conference have been set up to promote our initiatives.

Organizational Structure (as of July 2018)



Scope of Companies Subject to Consolidated EMS

The consolidated EMS scope covers all consolidated subsidiaries\* on the financial accounting basis and non-consolidated subsidiaries considered material from the viewpoint of environmental management. The 671 consolidated EMS companies consist of 246 production and sales companies under the direct control of TMC (12 production and sales companies, 77 production companies, and 157 non-production companies), as well as 425 companies managed by way of consolidated subsidiaries.

\* Since FY2017, in addition to the subsidiaries based on the formal standards, those based on the effective control standards have also been added

Details of Actions

- Jointly adopt the Toyota Earth Charter and draft individual environmental policies
- In production, set quantitative goals and follow up on those goals
- In sales, develop environmental management systems, and carry out environmental communication and other initiatives
- Implement top-level environmental responses based on actual conditions in each country and region

• TMC's requirements for non-consolidated companies on the financial accounting basis may vary according to region and the nature of business

Main Companies Subject to Consolidated EMS in Japan (Alphabetical Order)

Production Companies

Group 1	Group 2	Group 3	Group 4	Group 5
• Consolidated subsidiaries • Automotive production companies and others • TMC secondary companies	• Companies not subject to consolidated accounting • Main parts manufacturers • Body manufacturers, etc.	• Consolidated subsidiaries • Parts manufacturers	• Consolidated subsidiaries • Various other products production companies	• Companies not subject to consolidated accounting • Parts manufacturers
Daihatsu Motor Co., Ltd. Toyota Motor Kyushu, Inc. Toyota Motor East Japan, Inc. Toyota Motor Hokkaido, Inc. Toyota Auto Body Co., Ltd. Hino Motors, Ltd.	Aisin Industry Co., Ltd. Aisin AW Co., Ltd. Aisin AI Co., Ltd. Aisin Seiki Co., Ltd. Aisin Takaoka Co., Ltd. Aichi Steel Corporation JTEKT Corporation Denso Corporation Tokai Rika Co., Ltd. Toyoda Gosei Co., Ltd. Toyota Industries Corporation Toyota Tsusho Corporation Toyota Boshoku Corporation	Cataler Corporation Kyoho Machine Works, Ltd. Central Motor Wheel Co., Ltd. Toyota Home Co., Ltd. Primearth EV Energy Co., Ltd. Yutaka Seimitsu Kogyo, Ltd.	Admatechs Co., Ltd. Shintec Hozumi Co., Ltd. Toyota Energy Solutions Inc. Japan Chemical Industries Co., Ltd.	FTS Co., Ltd. Kyowa Leather Cloth Co., Ltd. Koito Manufacturing Co., Ltd. Taiho Kogyo Co., Ltd. Chuooh Pack Industry Co., Ltd. Chuo Spring Co., Ltd. Tsuda Industries Co., Ltd. Toyoda Iron Works Co., Ltd. Trinity Industrial Corporation Fine Sinter Co., Ltd. Futaba Industrial Co., Ltd.
All-Toyota Production Environment Conference Members		All-Toyota Production Environment Meeting Members		

Scope of Overseas Consolidated EMS (as of the End of March 2018)

Europe region <b>38</b> subsidiaries European Environment Committee (2002-)	China region <b>14</b> subsidiaries China Environment Committee (2007-)	North America region <b>18</b> subsidiaries North America Environment Committee (2004-)
Africa region <b>3</b> subsidiaries South Africa Environment Committee (2008-)	Asia and Oceania regions <b>25</b> subsidiaries Asia Pacific Environment Committee (2007-)	South America region <b>3</b> subsidiaries South America Environment Committee (2006-)

(as of March 31, 2018)

Logistics Companies

• Consolidated subsidiaries • Finished vehicle distribution • Parts distribution
Aichi Rikuun Co., Ltd. Tobishima Logistics Service, Inc. Toyota Transportation Co., Ltd. Toyotuji Shipping Co., Ltd.
All-Toyota Logistics Environment Conference Members

Sales Companies

Fukuoka Toyopet Corporation Toyota Corolla Aichi Co., Ltd. Total: 50 companies
Other Business
TACTI Corporation Toyota Enterprises Inc. Toyota Central R&D Labs, Inc. Delphys Inc. Aero Asahi Corporation Total: 48 companies
• Including one company not subject to consolidated accounting



## Promote Strengthening of Consolidated Environmental Management

### Environmental Performance in Each Country and Region

Toyota formulates annual policies and conducts initiatives based on the policies to ensure that all business activities achieve top levels of environmental performance.

In FY2018, each of our production and sales companies formulated fiscal year plans and promoted measures to ensure achievement of the plan goals.

#### Action Policies and Results of Major Affiliates Implementing Consolidated Environmental Management in FY2018

	Action Policy	Goals	Activity Results
Overall	<ul style="list-style-type: none"> <li>Promote environmental management through strengthened cooperation with each region</li> </ul>	<ul style="list-style-type: none"> <li>Achieve goals in all areas</li> </ul>	<ul style="list-style-type: none"> <li>Strengthened consolidated environmental management               <ul style="list-style-type: none"> <li>Carried out environmental meetings in Japan and overseas</li> <li>Conducted global ECO. Awards</li> </ul> </li> <li>Promoted activities under the Sixth Toyota Environmental Action Plan</li> </ul>
Production (83 companies) Japan (40 companies) Overseas (43 companies*)	<ul style="list-style-type: none"> <li>All companies to implement initiatives toward achieving FY2018 goals</li> <li>All companies to strengthen activities to prevent recurrence of non-compliance and complaints</li> <li>Maintain and improve environmental management systems</li> </ul>	<ul style="list-style-type: none"> <li>Achieve goals in Japan and other regions</li> <li>Zero non-compliance and complaints</li> <li>Renew ISO 14001 certification</li> </ul>	<ul style="list-style-type: none"> <li>All companies implemented systematic measures and nearly all the goals were achieved</li> <li>While there were no major issues, there were six minor incidents of non-compliance (three incidents in Japan and three overseas)</li> <li>ISO 14001 acquisition: 100% in Japan and overseas</li> </ul>
Sales (101 companies) Japan (50 companies) Overseas (51 companies*)	<ul style="list-style-type: none"> <li>Promote environmental initiatives by ensuring thorough implementation of Toyota dealer CSR checklist, reducing CO<sub>2</sub> emissions by improving environmental management, and supporting third-party certification</li> <li>Promote and strengthen environmental initiatives led by regional headquarters and distributors in each country (reducing CO<sub>2</sub> emissions etc.)</li> <li>Promote and strengthen Dealer Environmental Risk Audit Program (DERAP)<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>Increase number of dealers acquiring EMS certification</li> <li>Build environmental initiative promotion frameworks in each region</li> <li>Percentage of dealers achieving goals: 100%</li> </ul>	<ul style="list-style-type: none"> <li>Dealers acquiring Eco-Action 21<sup>1</sup> certification: 5</li> <li>Environmental activities framework under way according to plans in each region</li> <li>Percentage of dealers achieving goals: 95%</li> </ul>

<sup>1</sup> Eco-Action 21: An easy-to-adopt guideline by Ministry of the Environment of Japan under which companies raise their environmental awareness, set goals, and take action.

The guideline integrates environmental management systems, environmental performance assessment, and environmental reporting into a single system.

<sup>2</sup> DERAP: Toyota uses DERAP to reduce environmental risks at overseas dealer service shops

\* Includes the 12 production and sales companies

### Eco-factory Activities

Toyota has been conducting eco-factory activities since FY2004 with the aims of steadily incorporating environmental measures into plant activities and becoming No. 1 regional plant. Our eco-factory activities are to build and develop a mechanism which surely incorporates environmental measures into each stage from planning to design and operations. These measures will be utilized for projects such as construction of new plants, major renovations of existing plants, and capacity expansions. We go to local sites to directly confirm necessary items regarding environmental consciousness and make improvements to address any issues to ensure our environmental measures are performed. In FY2018, we carried out eco-factory measures at six plants in Mexico, the United States, China, Indonesia, and Malaysia. We will continue to promote eco-factory activities as a means to contribute to regional environmental conservation around the world.

### Eco-factory Activities

Region	Mexico	U.S.	China		Indonesia	Malaysia
Office, plant	TMMGT	MTMUS	GTMC Plant No. 3	TFTM new plant	TMMIN new engine plant	ASSB Plant No. 2
Planning stage		2019				
Audits of facility specifications	2018	2019				2018
On-site audit (building)	2019	2020	2018	2018		2019
On-site audit (equipment)	2019	2020	2018	2019		2019
Compliance and risk assessment	2020	2022	2019	2020		2020
Performance assessment	2021	2023	2020	2021	2018	2021

• The years indicate activities implemented in FY2018 or planned for fiscal years thereafter

: Completed

## Global ECO. Awards

Toyota presents its own Global ECO. Awards for production and logistics companies to encourage environmental *kaizen* activities at overseas affiliates for carrying out the Toyota Environmental Challenge 2050 and promote *yokoten*<sup>1</sup> of the best improvement practices.

In FY2018, six finalists out of 19 teams selected from six regions around the world were invited to give their presentations in Japan. The team from Toyota do Brasil (TDB) won the Platinum Award for its VOC<sup>2</sup> reduction initiatives. Even among the award winners, best practices regarding uniqueness, effectiveness, and potential for application at other sites, in particular, were selected by a vote of all attendees to receive special prizes.

<sup>1</sup> *Yokoten* refers to sharing of improvement practices, know-how, non-compliance and other information within the All-Toyota Group

<sup>2</sup> VOC (Volatile Organic Compounds): Used in painting, adhesives, and other products, VOCs are volatile at room temperature under normal pressure. VOCs cause air pollution and soil contamination, raising concerns about the influence on the human body.



Members of the Platinum Award winning team from TDB with TMC Executive General Manager Toshio Niimi

## Award Results

Award Categories		Award for On-site <i>Kaizen</i> Activity
Platinum Award		TDB (Brazil) ..... <a href="#">Environmental Management p. 56</a>
Gold Awards	Innovation Award*	TMMC (Canada)
		TMMT (Turkey) ..... <a href="#">Challenge 5 p. 43</a>
	<i>Yokoten</i> Award*	GTMC (China)
	Zero Challenge Award*	TKM & TKAP (India) ..... <a href="#">Challenge 2 p. 27</a>
		TASA (Argentina) ..... <a href="#">Challenge 5 p. 43</a>
Silver Awards		TMMC (Canada)
		TMMMS (U.S.)
		TMMF (France)
		SFTM Chanchun (China)
		FTEC (China)
		SFTM Sichuan (China)
		TKM (India)
		TAP (The Philippines)
		TMT-BP (Thailand)
		TMT (Thailand)
		TSAM (South Africa)

\* Special Awards

## Legal Compliance Activities

Toyota aims to ensure that its production activities pose zero environmental risk to local communities. The foundation of our efforts is preventive measures to avoid non-compliance issues and complaints. Neglecting preventive measures can lead to situations where non-compliance may occur. We consider these situations to be non-compliance near-misses, and we take stringent measures to root out the causes of these near-misses and prevent reoccurrence.

For incidents posing significant risk, we share information on reoccurrence prevention measures through environmental affairs meetings at all Group companies. Additionally, we are taking measures to completely eliminate the use of ozone-depleting substances (ODS), and no significant releases have been found. In FY2018, Toyota was not involved in any major environmental incidents causing air or water pollution, nor was the Group subject to fines or penalties. However, rainwater came in contact with cement during piling work on a building construction site at Honsha Plant, and alkaline runoff flowed through rainwater ditches into a river, causing environmental non-compliance. A report was immediately made to the administrative authorities and improvement to neutralize rainwater runoff was implemented at the construction site that was the source.

To prevent reoccurrence in the future, construction of water discharge plans will be comprehensively put into operation companywide in anticipation of water discharge occurring as a result of rain or other causes during the planning and construction stages.

We continued to outsource proper treatment of polychlorinated biphenyl (PCB). Also, due to amendment of the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes, we are conducting a survey of high-concentration PCB ballast stabilizers (compressors in which PCB is sealed) at all plants and sites in order to complete treatment of high-concentration PCB waste by the March 31, 2021 deadline.

At six of our production plants, we completed groundwater pollution prevention measures in 1997. We continue to conduct pumping aeration and purification to complete purification and ensure that groundwater is purified to levels below standards.

The levels of trichloroethylene at production plants are reported to the government and to local councils in the surrounding communities.

[Environmental Data p. 63-P, Q](#)

## Emissions Reductions That Contribute to Improvement of Urban Atmospheric Environments in Each Country and Region

Based on the Guiding Principles at Toyota, which call for us to dedicate our business to providing clean and safe products, we are working to develop and make widely available vehicles with outstanding environmental performance, we are working to clarify the true state of the environment by introducing atmospheric reaction analysis equipment. We are also conducting cooperative atmospheric environment research according to the research levels and needs of each country and region, contributing to improvement of the atmospheric environment around the world. We actively participate in atmospheric enhancement measures conducted by the Japan Automobile Manufacturers Association and conduct joint research with research institutions, universities, and other organizations in countries worldwide.

## Reduce VOC Emissions in Production Activities

Volatile Organic Compounds (VOCs\*) are one of the causes of photochemical oxidation, the cause of photochemical smog. Toyota has been striving to reduce VOCs emitted in vehicle painting processes. Specifically, we have reduced the use of paints and thinners, continuously promoting initiatives linked to painting facility refurbishment plans and day-to-day activities to reduce VOC emissions.

For FY2018, as a result of continuous day-to-day activities to reduce VOC emissions, the volume of VOC emissions per area painted in TMC body painting processes (average for all lines) was 14.4 g/m<sup>2</sup> (down 1.0 percent year on year). For TMC and its consolidated subsidiaries in Japan, VOC emissions volume was 21.5 g/m<sup>2</sup> (up 0.2 percent year on year).

Also, the volume of VOC emissions per area painted in TMC bumper painting processes (average for all lines) was 176 g/m<sup>2</sup> (down 8.8 percent year on year).

\* VOC (Volatile Organic Compounds): Used in painting, adhesives, and other products, VOCs are volatile at room temperature under normal pressure. VOCs cause air pollution and soil contamination, raising concerns about the influence on the human body.

### Trends in VOC Emissions Volume in Vehicle Body Painting Processes at TMC in Japan (Average for All Lines)

Third-Party Assurance

	FY	2014	2015	2016	2017	2018
VOC emissions per area painted (g/m <sup>2</sup> )		18.8	17.2	15.8	14.6	14.4

### Trends in VOC Emissions Volume in Vehicle Body Painting Processes by Consolidated Subsidiaries in Japan

	FY	2014	2015	2016	2017	2018
VOC emissions per area painted (g/m <sup>2</sup> )		24.1	22.6	21.8	21.5	21.5

• Vehicle assembly plants of TMC and consolidated subsidiaries and other companies in Japan, a total of eight companies

### Trends in VOC Emissions Volume in Bumper Painting Processes at TMC in Japan (Average for All Lines)

	FY	2014	2015	2016	2017	2018
VOC emissions per area painted (g/m <sup>2</sup> )		310	282	253	193	176



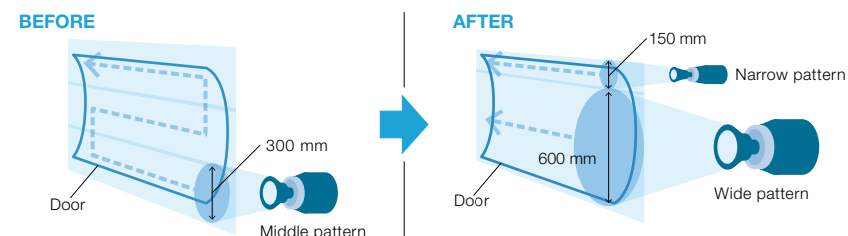
### VOC Reduction Initiatives at TDB Plant (Brazil)

Toyota do Brasil (TDB), a vehicle production and sales company in Brazil, takes measures to reduce VOC emissions in painting processes on a daily basis.

All team members participated in identifying issues in painting processes and proposing countermeasures. VOC emissions have been steadily reduced through the cumulative results of 12 improvement measures. The measures were formulated while making reference to examples of best practices from other TMC and Toyota plants. Among the measures, using a combination of different spray sizes for the door trim clear and intermediate-edge painting processes eliminated wasteful painting width. When two types of sprays are used in combination, it is extremely difficult to maintain uniformity of the paint film, but repeated improvements were made until uniform paint quality was achieved through a process of trial and error regarding the distance from the painted surface, the rotation speed of the sprays, spray pressuring during rotation, and other painting robot settings.

In addition, a detailed review of recovery methods for solvents used in washing processes was conducted and improvements to prevent solvents from spilling were repeatedly implemented including reviewing the size and number of receptacles. Each worker conducted recovery work with an awareness to prevent VOC emissions. As a result, VOC emissions per unit produced was cut from 33.9 g/m<sup>2</sup> to 31.5 g/m<sup>2</sup>, a reduction of 6.9 percent.

These initiatives won the Platinum Award of the TMC Global ECO Awards.



## Promote Environmental Activities in Cooperation with Business Partners (Suppliers)

Toyota purchases a wide range of materials, parts, and equipment from many different suppliers. We have collaborated with suppliers on implementing environmental initiatives through TOYOTA Green Purchasing Guidelines<sup>1</sup>, seminars, and other means.

After announcing the Toyota Environmental Challenge 2050, we revised guidelines in January 2016, working with suppliers to maintain existing measures including compliance with the laws and regulations of each country and managing substances of concern and undertake a broad range of environmental initiatives to reduce greenhouse gases (GHG), assess water risks and reduce impact on water environments from those risks, encourage resource recycling, and protect ecosystems in support of the Challenge. We have been working even closer with suppliers to that end.

We request that our tier 1 suppliers to roll out environmental initiatives to their suppliers, and we seek to realize entire supply chain management in the pursuit of a sustainable society.

<sup>1</sup> Green Purchasing Guidelines: Prioritizing the purchase of parts, materials, equipment, and services with a low environmental footprint when manufacturing products

### Completed Revision of the Green Purchasing Guidelines Globally

Toyota conducts purchasing not only in Japan, but in regions around the world. Each affiliate has its own Green Purchasing Guidelines. After the revision of the TOYOTA Green Purchasing Guidelines in Japan (completed in January 2016), we completed revision of guidelines at overseas sites in FY2017 and requested that suppliers implement measures.

### Mutual Study About the Environment

Each year, we hold a forum for studying environmental issues with suppliers.

In FY2018, a management roundtable conference on the environment was held in June with the participation of the management from many key suppliers. Toyota gave a briefing on the Toyota Environmental Challenge 2050 and renewed its request to suppliers for their cooperation and collaboration in carrying out the Challenge. There were also presentations by participating companies on examples of their own environmental initiatives, a question and answer session, and an exchange of opinions, deepening understanding of common issues.

### Recognition of Suppliers' Environmental Initiatives Started

Toyota established the Environmental Activity Awards in FY2018 to commend suppliers who make company-wide efforts with major contributions to conduct environmental initiatives throughout the vehicle lifecycle and entire supply chain. The awards were presented at the Global Suppliers Conference, which also serves as a forum for Toyota to explain its action policies.

### Assessing Risks and Opportunities Related to Climate Change and the Water Environment in Supply Chains

We introduced the CDP Supply Chain<sup>2</sup> Program in FY2016 to support the continual implementation and improvement of environmental initiatives conducted with suppliers. The program enables us to assess environmental risks and opportunities across the supply chain.

We have been enhancing the program's activities through briefings and other types of communication with suppliers.

<sup>2</sup> Supply chain: The entire flow of business activities related to a product, from procurement of materials for manufacturing, to production control, logistics, and sales

### Ensuring Compliance with REACH and Other Global Regulations on Chemical Substances

In order to minimize severe negative impacts on human health and the environment due to the production and usage of chemical substances, nations are strengthening laws related to chemical substances, which include the Chemical Substances Control Law in Japan, and the ELV Directive<sup>3</sup> and REACH regulation<sup>4</sup> in Europe. To properly respond to these regulations, Toyota has built and is operating chemical substance management frameworks in cooperation with its suppliers.

We continued these efforts in FY2018 and asked suppliers in Japan to conduct self-assessments of their operations. We also worked with suppliers to take further measures. We also shared these efforts to main overseas sites.

<sup>3</sup> ELV Directive: A European Union directive on vehicle disposal designed to reduce the impact of End-of-life vehicles on the environment

<sup>4</sup> Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) regulation: A European Union regulation for managing chemical substances to protect human health and the environment

## Promote Environmental Activities in Cooperation with Business Partners (Dealers and Distributors)

Toyota has strong bonds of trust with its dealers and distributors built on shared values for products and services, supporting a long history of collaborative initiatives in environmental activities.

Given their direct contact with customers, dealers are a critical partner in carrying out environmental initiatives. Therefore, we are fully implementing a Toyota dealer CSR checklist in Japan and taking measures to enhance environmental controls to reduce CO<sub>2</sub> emissions. In overseas regions, we strongly promote environmental management through environmental activities led by regional headquarters and distributors along with continual DERAP implementation.

### Promoting Environmental Initiatives at Domestic Dealers

The Toyota National Dealers' Advisory Council (TNDAC) promotes unified efforts among all dealers in Japan to implement voluntary activities based on the Toyota Dealer CSR Guidelines set forth in 2005. To further promote environmental initiatives, TNDAC encourages dealers to attain third-party certification of their environmental management systems and accelerate the development of environmentally conscious dealerships and human resources, in which we aim to bolster customer trust in Toyota dealers. In FY2018, we used the Toyota dealer CSR checklist to promote thorough environmental assessments at dealers while also encouraging the acquisition of Eco-Action 21 accreditation. As a result, five additional dealers attained Eco-Action 21 accreditation.

Moving forward, we will strive to improve environmental initiatives by working together with dealers to enhance environmental performance and planning Toyota's new initiatives.

### Raise Ratio of Dealers Achieving DERAP

Toyota continues the Dealer Environmental Risk Audit Program (DERAP) to reduce environmental risks at overseas dealer service shops. These audits aim to establish a framework to deal with five fundamental environmental requirements, including the proper management of waste and treatment of water discharge. From FY2018, as new items, checking for and keeping records on the presence of oil on the surface of water in final separation tanks, and maintaining records through periodically washing all tanks were added, enhancing the quality of activities.

In FY2018, 92 distributors and 4,296 dealers from 89 countries worldwide participated in DERAP, representing an increase of nine distributors and 63 dealers from FY2017. The five requirements were satisfied by 4,086 dealers, 95 percent of all participating dealers (up 4 percent year on year). Globally, there are still many Toyota distributors and dealers which do not participate in the program. We will continue to support expansion of DERAP participation and promote the activities of the participating companies. We

will also be responsible for creating environmental guidelines of each overseas region based on global environmental guidelines for dealers and distributors, tracking the progress of their operation.

## Further Strengthen Global Employee Education and Awareness Activities

In accordance with the national policies of Japan, Toyota designated June as its "Toyota Environment Month" in 1973 and has been taking measures since then to raise employees' awareness and actions for the environment. In 1991, we changed the name to "Toyota Global Environment Month," and we are expanding activities globally.

We ensure that all global employees are aware of Toyota Global Environment Month by distributing the President's message on the environment through global affiliates in their local languages and making event-related notifications on monitors at various locations throughout company sites and on the intranet.

### Year-round Awareness Activities for Employees

Starting in FY2018, we provided environmental information to employees, planning and carrying out a variety of programs throughout the year to enhance employees' environmentally conscious mind and accelerate measures for achieving the Toyota Environmental Challenge 2050. Toyota Global Environment Month is considered to be one part of these measures.

For each program, a cycle with three phases—know, learn, and act by taking voluntary action—are performed with regard to the environment, and options are available for each rank according to the level of employees' awareness and environmental understanding. During the "know" phase, in order to raise employees' awareness, digital signages installed at each company site disseminate environmental information, educational splash screens are displayed when PCs are started up, and stickers encouraging energy saving by setting air conditioning temperatures appropriately in conference rooms and by closing the lids of electronic bidets seats in rest rooms are placed. During the "learn" phase, we provide opportunities to learn throughout the year such as holding environmental lectures presented by outside instructors, conducting internal environmental seminars by the general manager of the Environmental Affairs Division, and reimbursing test fees for employees who pass the environmental specialist certification test (Eco Test).



Stickers placed in conference rooms and rest rooms



An environmental lecture



Editorial Policy Contents Overview Highlights Message from the Head of the Company			Environmental Challenges Sixth Toyota Environmental Action Plan		Six Challenges Environmental Management	Environmental Data Third Party Assurance Report	
Challenge 1 New Vehicle Zero CO <sub>2</sub> Emissions Challenge	Challenge 2 Life Cycle Zero CO <sub>2</sub> Emissions Challenge	Challenge 3 Plant Zero CO <sub>2</sub> Emissions Challenge	Toward Realizing a Decarbonized Society in 2050	Challenge 4 Challenge of Minimizing and Optimizing Water Usage	Challenge 5 Challenge of Establishing a Recycling-based Society and Systems	Challenge 6 Challenge of Establishing a Future Society in Harmony with Nature	Environmental Management

In the “act” phase, Environmental Campaign of Creative Suggestion System was conducted as a main program of Toyota Global Environment Month, and a wide variety of environmental proposals were submitted. Company-wide, more than 25,000 suggestions were received, serving as an opportunity to raise awareness. In addition, inspirational posters that depict the gazes of animals were created as an approach that will spontaneously generate interest in order to raise employees’ awareness and understanding of eco-driving. Posters were displayed five times starting in June, which is Toyota Global Environment Month, in employee cafeterias, employee entrances and communication spaces, employee dormitories, company housing, and other locations. At the same time, we renewed the eco-driving introduction section on the website of the Environmental Affairs Division to provide fun and easy to understand explanations. In November, which has been designated Eco-Driving Month by the Japanese government, a pamphlet that includes all of the posters previously displayed and information from the website as well as 10 key points on why eco-driving is recommended was produced and distributed to all employees (approximately 80,000 persons).



Posters (three items to the left)



Pamphlet

### New Employee Training Program Raises Sense of Ownership

In FY2018, new employee training program was conducted three times in April. The current status and risk of and issues concerning Toyota’s environment undertakings were explained to 756 new administrative and engineering employees. The aim is to instill the knowledge necessary for carrying out work with the same high level of awareness of the environment as safety and quality.

In addition to conventional classroom instruction, time is spent on group discussions and presentations on topics such as “environmental risks that Toyota should prioritize” and “countermeasures and actions” to address risks so that the participants see the environment as a personal issue. Later, employees discuss their personal environmental dreams and hopes that they would like to achieve.

Participants commented that the training raised their sense of ownership regarding environmental issues and that they plan to continue working with dedication to achieve their dreams.



Classroom lecture in new employee training program



A group discussion in new employee training program

### Enhance Active Disclosure of Environmental Information and Communication

Toyota Motor Corporation (TMC) strives to proactively disclose environmental information and enhance its communication through an annual Environmental Report, its website, and events.

In February 2018, our Environmental Report 2017 won the Excellent Prize in the Environmental Reporting Category of the 21st Environmental Communication Awards sponsored by Ministry of the Environment of Japan and other organizations. Toyota was awarded for two consecutive years following the Excellence Prize in the Global Warming Countermeasure Reporting Category won by the Environmental Report 2016. On its website, TMC released seasons 2 and 3 of “econohito,” which is a web movie content featuring employees who strive to carry out environmental activities toward achieving the Toyota Environmental Challenge 2050. At events, Toyota’s environmental initiatives were presented in easy to understand formats and workshops and other programs raised environmental awareness. Toyota will continue to enhance content even further, activating communications.

econohito [Web https://www.toyota-global.com/sustainability/environment/econohito/](https://www.toyota-global.com/sustainability/environment/econohito/)



Awards ceremony for the 21st Environmental Communication Awards



An environmental event at MEGA WEB



## Environmental Data

### Challenge 1: New Vehicle Zero CO<sub>2</sub> Emissions Challenge

#### A Sales of Electrified Vehicles (Global)

[Third-Party Assurance](#)

Year	2015	2016	2017
Vehicle sales (thousand units)			
Hybrid and plug-in hybrid vehicles	1,203.9	1,400.6	<b>1,517.9</b>
Fuel cell vehicles	0.5	2.0	<b>2.7</b>
Total	1,204.4	1,402.6	<b>1,520.6</b>

### Challenge 3: Plant Zero CO<sub>2</sub> Emissions Challenge

#### B Calorific Energy Use Ratio at TMC (Japan)

[Third-Party Assurance](#)

FY	2016	2017	2018
Ratio (%)			
Electricity	45.8	44.8	<b>45.3</b>
City gas	49.3	51.3	<b>50.1</b>
Heavy oil A	4.1	2.9	<b>2.9</b>
Kerosene	0.4	0.5	<b>0.4</b>
Hot water	0.3	0.3	<b>0.3</b>
Cold water	0.1	0.1	<b>0.1</b>
Renewable energy	0.0	0.1	<b>0.9</b>

• Conversion factors: [↗ Environmental Data p. 64-Y](#)

#### C Global Total CO<sub>2</sub> Emissions (Actual Emissions)

[Third-Party Assurance](#)

Volume from Energy Consumption at Stationary Emission Sources				
	FY	2016	2017	2018
Total CO <sub>2</sub> emissions (million tons)				
Japan (TMC)		1.52	1.51	<b>1.49</b>
Japan (consolidated EMS and its subsidiaries)		4.03	4.23	<b>4.29</b>
North America		0.93	1.00	<b>0.99</b>
China		0.63	0.64	<b>0.66</b>
Europe		0.25	0.28	<b>0.28</b>
Asia (excluding Japan), Australia, Middle East, South Africa, Latin America		0.73	0.82	<b>0.77</b>
Total		8.09	8.48	<b>8.48</b>
CO <sub>2</sub> emissions per unit produced (tons/unit)		0.795	0.805	<b>0.806</b>

• Scope of coverage: TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 121 companies

[↗ Environmental Data p. 63-R](#)

• GHG Protocol was used to calculate emissions

• Conversion factors: [↗ Environmental Data p. 64-X](#)

• Revised due to an error in past data

## Challenge 4: Challenge of Minimizing and Optimizing Water Usage

### D Global Energy Consumption (at Stationary Emission Sources)

Third-Party Assurance

	FY	2016	2017	2018
Consumption volume by region (PJ <sup>1</sup> )				
Japan (TMC)		15.5	15.8	<b>15.6</b>
Japan (consolidated EMS and its subsidiaries)		46.3	45.9	<b>46.7</b>
North America		13.5	13.5	<b>13.6</b>
China		5.7	5.7	<b>5.9</b>
Europe		3.7	3.7	<b>3.8</b>
Asia (excluding Japan), Australia, Middle East, South Africa, Latin America		8.0	8.0	<b>7.6</b>
Total		92.7	92.6	<b>93.2</b>
Energy consumption per unit produced (GJ <sup>2</sup> /unit)		9.12	8.79	<b>8.85</b>

<sup>1</sup> PJ (Peta joule):Peta represents 10<sup>15</sup> and a joule is a unit of energy<sup>2</sup> GJ (Giga joule):Giga represents 10<sup>9</sup> and a joule is a unit of energy

- Scope of coverage: TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 121 companies

[↗ Environmental Data p. 63-R](#)

- Conversion factors: [↗ Environmental Data p. 64-Y](#)

- Revised due to an error in past data

	FY	2016	2017	2018
Consumption volume by energy type (PJ)				
Electricity		38.7	38.5	<b>38.5</b>
City gas		29.7	29.9	<b>30.1</b>
Natural gas		15.0	15.0	<b>15.0</b>
LPG		2.3	2.3	<b>2.3</b>
LNG		0.9	0.9	<b>1.1</b>
Coke		1.0	1.0	<b>1.0</b>
Coal		0.5	0.5	<b>0.6</b>
Heavy oil A		1.2	1.0	<b>0.9</b>
Diesel oil		0.4	0.4	<b>0.4</b>
Kerosene		0.2	0.2	<b>0.2</b>
Steam		1.1	1.1	<b>1.2</b>
Hot water		0.7	0.7	<b>0.7</b>
Others		0.7	0.7	<b>0.6</b>
Renewable energy		0.3	0.4	<b>0.6</b>
Total consumption		92.7	92.6	<b>93.2</b>

- Revised due to an error in past data

### E Global Water Withdrawal Volume by Source

	FY	2017	2018
Water withdrawal volume (million m <sup>3</sup> )			
Municipal water		47.9	<b>47.9</b>
Groundwater		12.0	<b>12.6</b>
Rainwater		0.2	<b>0.2</b>
Water discharge from other organizations		0.8	<b>0.0</b>

- Scope of coverage: TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 113 companies
- Prior results were revised in conjunction with changes to the scope of coverage

### F Global Water Discharge by Destination

	FY	2017	2018
Water discharge volume (million m <sup>3</sup> )			
River/lake		32.3	<b>32.9</b>
Groundwater		0.7	<b>0.4</b>
Brackish surface water/seawater		3.1	<b>2.8</b>
Sewage		9.2	<b>8.9</b>
Other organizations		0.6	<b>1.8</b>

- Scope of coverage: TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 101 companies
- Prior results were revised in conjunction with changes to the scope of coverage

### G Global Recycled Water Discharge

	FY	2017	2018
Volume of recycled water discharge (million m <sup>3</sup> )		2.2	<b>1.9</b>

- Scope of coverage: TMC and consolidated subsidiaries and other companies in Japan and overseas, a total of 113 companies
- Prior results were revised in conjunction with changes to the scope of coverage

## Challenge 5: Challenge of Establishing a Recycling-based Society and Systems

### H Trends in Vehicle Recovery Rate and ASR<sup>1</sup>

#### Recovery Rate at TMC (Japan)

	FY	2014	2015	2016	2017	2018
Vehicle recovery rate <sup>2</sup> (converted into a per-vehicle value) (%)		99	99	99	99	<b>99</b>
ASR recovery rate <sup>3</sup> (%)		96	97	97	98	<b>98</b>

<sup>1</sup> Automobile Shredder Residue: Residue after vehicles are shredded

<sup>2</sup> Vehicle recovery rate: Calculated by combining the percentage recycled and recovered through the dismantling and shredding processes, approximately 83% (quoted from the April 2003 joint council report), with the remaining ASR rate of 17% × ASR recovery rate of 98%

<sup>3</sup> ASR recovery rate: Recovery volume/amount collected

### I Trends in Damaged and Removed Bumpers Collected and Recovered at TMC (Japan)

	FY	2014	2015	2016	2017	2018
Amount collected (thousand pieces)		912	855	809	770	<b>775</b>
Collection rate (%)		72.5	72.9	69.4	67.4	<b>68.3</b>

### J Volume of Raw Materials Used and Ratio of Recycled Materials Used (Global)

	FY	2017	2018
Volume of raw materials used (million tons)		13.9	<b>13.75</b>
Ratio of recycled materials used (%)		24	<b>24</b>

### K Damaged and Removed Parts Collected and Recovered at TMC (FY2018, Japan)

Bumpers	775,000 units (collection rate of 68.3%)
Lead wheel balance weights <sup>4</sup>	28.4 tons
Amount of oil delivered using tanker trucks (bulk supply system <sup>5</sup> )	64.8% of the volume sold by parts distributors

<sup>4</sup> Lead wheel balance weights: Weights used to ensure rotation balance when joining a wheel and tire

<sup>5</sup> Bulk supply system: Filling oil directly to large-capacity tanks located on site

### L Supply of Used and Remanufactured Parts at TMC (FY2018, Japan)

Parts name	Number of parts supplied	
	Used and remanufactured parts	New parts (reference)
Automatic transmissions	1,368	68
Power steering gear	3,932	1,784
Torque converters	1,196	4,328
Used parts	32,679	—

### M Breakdown of Total TMC Waste Volume

Third-Party Assurance

	FY	2014	2015	2016	2017	2018
Breakdown of total waste volume (thousand tons)						
Waste at cost		34.9	34.8	34.1	32.8	<b>31.7</b>
Incinerated waste		1.1	1.1	1.1	1.0	<b>1.0</b>
Landfill waste		0.0	0.0	0.0	0.0	<b>0.0</b>
Total		36.0	35.9	35.2	33.8	<b>32.7</b>

### N Breakdown of Global Total Waste Volume

	FY	2014	2015	2016	2017	2018
Breakdown of total waste volume (thousand tons)						
Waste at cost		417	400	386	394	<b>417</b>
Incinerated waste		60	58	56	59	<b>63</b>
Landfill waste		17	17	19	21	<b>19</b>
Total		494	475	461	474	<b>499</b>

## Challenge 6: Challenge of Establishing a Future Society in Harmony with Nature

### O Results of Toyota Environmental Activities Grant Program (Global)

	FY	2014	2015	2016	2017	2018	Cumulative total
Country/region covered (programs)							
Asia-Pacific		8	7	5	7	<b>5</b>	<b>110</b>
North America, Latin America		0	0	1	0	<b>0</b>	<b>20</b>
Africa		2	1	3	1	<b>3</b>	<b>32</b>
Europe		0	2	1	2	<b>2</b>	<b>14</b>
Japan		14	11	16	18	<b>18</b>	<b>184</b>
Total		24	21	26	28	<b>28</b>	<b>360</b>

\* FY2018 grant topics: Biodiversity, climate change

## Environmental Management

### P Environment-related Non-compliance Incidents and Complaints at TMC (Japan)

	FY	2014	2015	2016	2017	2018
Non-compliance incident (Cases)		1 <sup>1</sup>	0	0	1 <sup>2</sup>	1
Complaint (Cases)		0	0	0	0	0

1 See P15 of the Environmental Report 2014

2 See P46 of the Environmental Report 2017

- Number of non-compliance incidents and complaints are determined based on internal standards

### Q Trichloroethylene Levels at TMC

(FY2018, Japan)

Third-Party Assurance

Plant	Levels of groundwater before remediation mg/L (Environmental standard value: 0.01)
Honsha	Less than 0.002-0.88
Motomachi	Less than 0.002-0.11
Kamigo	Less than 0.002-0.05
Takaoka	Less than 0.002-0.20
Miyoshi	Less than 0.002-0.08
Tsutsumi	Less than 0.002-0.31

- In 1997, Toyota completed implementation of measures to prevent outflow of groundwater at the six production plants listed above  
Toyota is continuing groundwater remediation using pump and aeration treatment without exceeding the standard values  
Trichloroethylene levels are reported to the authorities concerned  
Levels are also explained to citizens at local council meetings
- Measurements are taken at all Toyota Motor Corporation (TMC) plants, and nothing is detected at plants other than those listed
- The levels are expressed as a range since each plant includes multiple measurement points

## Statements Relating to Environmental Data

### R Scope of Data Coverage (TMC (One Company) and Consolidated EMS in Japan (77 Companies Including Subsidiaries) and Overseas (43 Companies), a Total of 121 Companies)

TMC: One company

Japan: Main production companies

Group 1	Group 2	Group 3	Group 4	Group 5
Daihatsu Motor Co., Ltd. Toyota Motor Kyushu, Inc. Toyota Motor East Japan, Inc. Toyota Motor Hokkaido, Inc. Toyota Auto Body Co., Ltd. Hino Motors, Ltd.	Aisan Industry Co., Ltd. Aisin AW Co., Ltd. Aisin AI Co., Ltd. Aisin Seiki Co., Ltd. Aisin Takaoka Co., Ltd. Aichi Steel Corporation JTEKT Corporation Denso Corporation Tokai Rika Co., Ltd. Toyoda Gosei Co., Ltd. Toyota Industries Corporation Toyota Boshoku Corporation	Cataler Corporation Kyoho Machine Works, Ltd. Central Motor Wheel Co., Ltd. Toyota Home Co., Ltd. Primearth EV Energy Co., Ltd. Yutaka Seimitsu Kogyo, Ltd.	Admatechs Co., Ltd. Shintec Hozumi Co., Ltd. Toyota Energy Solutions, Inc. Japan Chemical Industries Co., Ltd.	FTS Co., Ltd. Kyowa Leather Cloth Co., Ltd. Koito Manufacturing Co., Ltd. Taiho Kogyo Co., Ltd. Chuoh Pack Industry Co., Ltd. Chuo Spring Co., Ltd. Tsuda Industries Co., Ltd. Toyoda Iron Works Co., Ltd. Trinity Industrial Corporation Fine Sinter Co., Ltd.

Overseas: Main production and production/sales companies

North America	China	Europe	Asia (excluding Japan), Australia, Middle East, South Africa, Latin America
TMMK (U.S.) TMMI (U.S.) TMMWV (U.S.) TMMAL (U.S.) TMMTX (U.S.) TMMMS (U.S.) BODINE (U.S.) TABC (U.S.) TMMC (Canada) CAPTIN (Canada) TMMBC (Mexico)	TFTM TFTD TTFC TFAP TFTE FTCE SFTM GTMC GTE TMCAP	TMR (Russia) TMMP (Poland) TMMF (France) TMUK (U.K.) TMMT (Turkey) TPCA (Czech Republic)	TSAM (South Africa) TKM (India) TKAP (India) IMC (Pakistan) TMMIN (Indonesia) TMT (Thailand) STM (Thailand) ASSB (Malaysia) TMP (The Philippines) TAP (The Philippines) TMV (Vietnam)

### S Conversion Factors Used to Calculate "Global Average CO<sub>2</sub> Emissions from New Vehicles Reduction Rate Versus 2010 (Japan, U.S., Europe, China)"

Gasoline	2.32 kg-CO <sub>2</sub> /L
Diesel oil	2.58 kg-CO <sub>2</sub> /L
LPG	3.00 kg-CO <sub>2</sub> /kg, 0.507 kg/L (liquid density)*

\* Japan Environmental Management Association for Industry, "Carbon Footprint Communication Program, Basic Database" (version 1.01)

- "Greenhouse Gas Emissions Accounting and Reporting Manual" (version 4.3), Japanese Act on Promotion of Global Warming Countermeasures

### T Conversion Factors Used to Calculate Respective Emission Volume of 15 Categories in Scope 3 and Ratio of Total Emissions

Category	Conversion factors						
Category 1: Purchased goods and services	Ministry of the Environment of Japan, "Emissions Units Database for Accounting for Organizations' Greenhouse Gas Emissions, etc. Throughout the Supply Chain" (version 2.4)						
Category 2: Capital goods	Japan Environmental Management Association for Industry, "Carbon Footprint Communication Program, Basic Database" (version 1.01)						
Category 3: Fuel- and energy-related activities (not included in Scope 1 and Scope 2)	Greenhouse Gas Emissions Accounting and Reporting Manual" (version 4.3), Japanese Act on Promotion of Global Warming Countermeasures						
Category 5: Waste generated in business operations	Ministry of the Environment of Japan, "Emissions Units Database for Accounting for Organizations' Greenhouse Gas Emissions, etc. Throughout the Supply Chain" (version 2.4)						
Category 6: Business travel	Ministry of the Environment of Japan, "Emissions Units Database for Accounting for Organizations' Greenhouse Gas Emissions, etc. Throughout the Supply Chain" (version 2.4)						
Category 7: Employee commuting	Japan Environmental Management Association for Industry, "Carbon Footprint Communication Program, Basic Database" (version 1.01)						
	<table> <tr> <td>Gasoline</td><td>2.66 kg-CO<sub>2</sub>/L</td></tr> <tr> <td>Diesel oil</td><td>2.74 kg-CO<sub>2</sub>/L</td></tr> </table>	Gasoline	2.66 kg-CO <sub>2</sub> /L	Diesel oil	2.74 kg-CO <sub>2</sub> /L		
Gasoline	2.66 kg-CO <sub>2</sub> /L						
Diesel oil	2.74 kg-CO <sub>2</sub> /L						
Category 9: Downstream transportation and distribution	Greenhouse Gas Emissions Accounting and Reporting Manual" (version 4.3), Japanese Act on Promotion of Global Warming Countermeasures						
Category 11: Use of sold products	Japan Environmental Management Association for Industry, "Carbon Footprint Communication Program, Basic Database" (version 1.01)						
	<table> <tr> <td>Gasoline</td><td>2.66 kg-CO<sub>2</sub>/L</td></tr> <tr> <td>Diesel oil</td><td>2.74 kg-CO<sub>2</sub>/L</td></tr> <tr> <td>LPG</td><td>1.81 kg-CO<sub>2</sub>/L, 0.507 kg/L (liquid density)</td></tr> </table>	Gasoline	2.66 kg-CO <sub>2</sub> /L	Diesel oil	2.74 kg-CO <sub>2</sub> /L	LPG	1.81 kg-CO <sub>2</sub> /L, 0.507 kg/L (liquid density)
Gasoline	2.66 kg-CO <sub>2</sub> /L						
Diesel oil	2.74 kg-CO <sub>2</sub> /L						
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	Greenhouse Gas Emissions Accounting and Reporting Manual" (version 4.3), Japanese Act on Promotion of Global Warming Countermeasures						
	<table> <tr> <td>Gasoline</td><td>2.32 kg-CO<sub>2</sub>/L</td></tr> <tr> <td>Diesel oil</td><td>2.58 kg-CO<sub>2</sub>/L</td></tr> <tr> <td>LPG</td><td>3.00 kg-CO<sub>2</sub>/kg</td></tr> </table>	Gasoline	2.32 kg-CO <sub>2</sub> /L	Diesel oil	2.58 kg-CO <sub>2</sub> /L	LPG	3.00 kg-CO <sub>2</sub> /kg
Gasoline	2.32 kg-CO <sub>2</sub> /L						
Diesel oil	2.58 kg-CO <sub>2</sub> /L						
LPG	3.00 kg-CO <sub>2</sub> /kg						

### U Conversion Factors Used to Calculate "Trends in CO<sub>2</sub> Emissions per Ton-kilometer (Transportation Volume) from TMC Logistics Operations (Japan)"

Railway	22.0 g-CO <sub>2</sub> /tkm
Vessel	39.0 g-CO <sub>2</sub> /tkm
Gasoline	2.32 kg-CO <sub>2</sub> /L
Diesel oil	2.62 kg-CO <sub>2</sub> /L
Heavy oil C	2.98 kg-CO <sub>2</sub> /L

- Used "Guidelines on Disclosure of CO<sub>2</sub> Emissions from Transportation & Distribution" (version 3.0) issued by Ministry of Economy, Trade and Industry of Japan and Ministry of Land, Infrastructure, Transport and Tourism of Japan, and other guidelines

### V Conversion Factors Used to Calculate "Trends in Total CO<sub>2</sub> Emissions (from Energy Consumption at Stationary Emission Sources) and CO<sub>2</sub> Emissions per Unit Produced at TMC"

Electricity	0.3707 kg-CO <sub>2</sub> /kWh	Coke	3.2426 kg-CO <sub>2</sub> /kg
Heavy oil A	2.6958 kg-CO <sub>2</sub> /L	Coal	2.3557 kg-CO <sub>2</sub> /kg
Heavy oil C	2.9375 kg-CO <sub>2</sub> /L	Hot water	0.0570 kg-CO <sub>2</sub> /MJ*
Kerosene	2.5316 kg-CO <sub>2</sub> /L	Cold water	0.0570 kg-CO <sub>2</sub> /MJ
LPG	3.0040 kg-CO <sub>2</sub> /kg	Steam	0.0570 kg-CO <sub>2</sub> /MJ
City gas	2.1570 kg-CO <sub>2</sub> /Nm <sup>3</sup>		

- \* MJ (mega joule): Mega represents 10<sup>6</sup> and a joule is a unit of energy
- CO<sub>2</sub> emissions were calculated using the Nippon Keidanren's 1990 conversion factors

### W Conversion Factors Used to Calculate "Trends in Global Total CO<sub>2</sub> Emissions (from Energy Consumption at Stationary Emission Sources) and CO<sub>2</sub> Emissions per Unit Produced"

- GHG Protocol was used to calculate emissions
- Emissions from electric power were calculated using the 2001 conversion factor from the "CO<sub>2</sub> Emissions from Fuel Combustion" from IEA, Paris, France (2007 edition)
- For items other than electric power: 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.
- For city gas, steam, hot water, cold water, and coke-oven gas, the conversion factors used were those quoted in the Japanese Act on Promotion of Global Warming Countermeasures (March 2017)

### X Conversion Factors Used to Calculate Global Total CO<sub>2</sub> Emissions (from Energy Consumption at Stationary Emission Sources)

- GHG Protocol was used to calculate emissions
- Emissions from electric power were calculated using the 2015 conversion factor from the "CO<sub>2</sub> Emissions from Fuel Combustion" from IEA, Paris, France (2017 edition)
- For items other than electric power: 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
- For city gas, steam, hot water, cold water, and coke-oven gas, the conversion factors used were those quoted in the Japanese Act on Promotion of Global Warming Countermeasures (March 2017)

### Y Conversion Factors Used to Calculate Global Energy Consumption (at Stationary Emission Sources)

- Electricity conversion factor is 3.6 (GJ/MWh)
- Other energy conversion factors were based on the Japanese Act on Promotion of Global Warming Countermeasures (March 2017)



## Environmental Accounting

### Environmental Costs Scope of coverage: Toyota Motor Corporation

#### FY2017 and FY2018 Results Based on Format of Ministry of the Environment of Japan

		Toyota				Five vehicle body manufacturers <sup>1</sup>			
		2017		2018		2017		2018	
		Investments	Costs	Investments	Costs	Investments	Costs	Investments	Costs
(billion yen)									
Category	(1) Pollution prevention costs	0.3	1.4	0.4	1.4	0.3	2.3	0.5	2.1
Costs within business area	(2) Global environmental conservation costs	75.4	0.8	63.0	0.7	1.8	0.6	0.2	0.8
	(3) Resource recycling costs	0.1	2.0	0.1	2.1	0.1	1.6	0.0	1.7
Upstream/downstream costs	Recycling-related costs, industry organization shared costs	0.0	0.5	0.0	0.5	0.0	0.1	0.0	0.1
Management activities costs	Costs for environmental advertisements, environmental reports publishing, full-time environment-related employees, etc.	0.0	15.5	0.0	13.4	0.0	2.2	0.0	2.2
R&D costs	R&D costs to lower environmental concern	0.0	395.2	0.0	370.2	0.5	42.0	1.7	43.0
Social activities costs	Grants, etc. to environmental conservation organizations	0.0	0.6	0.0	0.5	0.0	0.0	0.0	0.0
Environmental damage response costs	Soil and groundwater remediation costs, etc.	0.2	9.1	0.1	3.8	0.0	0.0	0.0	0.0
Total		76.0	425.1	63.6	392.6	2.7	48.8	2.4	49.9
		501.1		456.2		51.5		52.3	

<sup>1</sup> Five vehicle body manufacturers: Toyota Motor East Japan, Inc., Daihatsu Motor Co., Ltd., Toyota Auto Body Co., Ltd., Hino Motors, Ltd., Toyota Motor Kyushu, Inc.  
(total based on each company's respective calculation standards)

- Errors in FY2017 data were corrected

### Economic Effect

#### Substantial Effect

	FY	2017	2018	Five vehicle body manufacturers <sup>1</sup>	
				2017	2018
(billion yen)					
Reduction in energy costs through energy conservation		0.6	0.6	1.6	1.4
Reduction in waste processing and treatment costs		0.1	0.1	0.0	0.0
Sales of recycled products		2.4	4.8	5.0	7.0
Total		3.1	5.5	6.6	8.4

- Errors in FY2017 data were corrected

#### Customer Benefits: Amount of Reduction in Oil Consumption by Switching to Hybrid Vehicles

	FY	2017	2018	Cumulative from December 1997 (first-generation Prius launch)
(billion yen)				
Japan		226.8	269.8	1,679.7
Worldwide		619.5	723.2	4,960.7

#### Customer Benefit Calculation Method (Japan Only)

- Calculation method: (Difference in average annual fuel efficiency<sup>2</sup> × number of vehicles owned<sup>3</sup> × average annual mileage<sup>4</sup>) × average gasoline price in each year<sup>5</sup>

<sup>2</sup> Difference in fuel efficiency between hybrid electric vehicles on the road in the fiscal year and corresponding gasoline vehicle models

<sup>3</sup> Number of vehicles owned by customers as estimated by Toyota from the number of hybrid electric vehicles sold each year adjusted for average vehicle age

<sup>4</sup> Calculated by Toyota estimate

<sup>5</sup> Nationwide average gasoline price in each year in Japan calculated by the Oil Information Center, the Institute of Energy Economics Japan

### Environmental Efficiency (Sales/Environmental Footprint)

#### CO<sub>2</sub> Index for Vehicle Production (for 10 Plants Only)

	FY	2014	2015	2016	2017	2018
Index		311	319	342	337	357
Sales	(billion yen)	11,040	11,210	11,590	11,480	12,200

- Sales/CO<sub>2</sub> emissions is used as an index, with FY1990 as 100

#### Waste Index for Vehicle Production

	FY	2014	2015	2016	2017	2018
Index		628	654	612	600	638
Sales	(billion yen)	11,040	11,210	11,590	11,480	12,200

- Sales/waste volume is used as an index, with FY1990 as 100

## Independent Practitioner's Assurance Report

# Deloitte.

デロイト トーマツ

(TRANSLATION)

### Independent Practitioner's Assurance Report

August 10, 2018

Mr. Akio Toyoda,  
President,  
Toyota Motor Corporation

Masahiko Sugiyama  
Representative Director  
Deloitte Tohmatsu Sustainability Co., Ltd.  
3-3-1, Marunouchi, Chiyoda-ku, Tokyo

We have undertaken a limited assurance engagement of the quantitative environmental information indicated with [Third Party Assurance](#) for the year ended March 31, 2018 (the "Quantitative Environmental Information") included in the "Environmental Report 2018" (the "Report") of Toyota Motor Corporation (the "Company").

#### The Company's Responsibility

The Company is responsible for the preparation of the Quantitative Environmental Information in accordance with the calculation and reporting standard adopted by the Company (as described in the footnotes of graphs and tables, etc., included in the Quantitative Environmental Information). Greenhouse gas quantification is subject to inherent uncertainty for reasons such as incomplete scientific knowledge used to determine emissions factors and numerical data needed to combine emissions of different gases.

#### Our Independence and Quality Control

We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. We apply International Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements*, and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

#### Our Responsibility

Our responsibility is to express a limited assurance conclusion on the Quantitative Environmental Information based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with the International Standard on Assurance Engagements ("ISAE") 3000, *Assurance Engagements Other than Audits or Reviews of Historical Financial Information*, issued by the International Auditing and Assurance Standards Board ("IAASB"), ISAE 3410, *Assurance Engagements on Greenhouse Gas Statements*, issued by the IAASB and the *Practical Guideline for the Assurance of Sustainability Information*, issued by the Japanese Association of Assurance Organizations for Sustainability Information.

The procedures we performed were based on our professional judgment and included inquiries, observation of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records. These procedures also included the following:

- Evaluating whether the Company's methods for estimates are appropriate and had been consistently applied. However, our procedures did not include testing the data on which the estimates are based or reperforming the estimates.
- Undertaking site visits to assess the completeness of the data, data collection methods, source data and relevant assumptions applicable to the sites.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement.

#### Limited Assurance Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the Company's Quantitative Environmental Information is not prepared, in all material respects, in accordance with the calculation and reporting standard adopted by the Company.

The above represents a translation, for convenience only, of the original Independent Practitioner's Assurance report issued in the Japanese language.

Member of  
Deloitte Touche Tohmatsu Limited



**Processing**

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**TOYOTA MOTOR CORPORATION**

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