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# STRENGTHENING OUR BUSINESS FOUNDATIONS TO ADDRESS ENVIRONMENTAL ISSUES

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## Environmental Governance

\* For more information on our Environmental Governance >>> [P051](#)

### Enhancing Environmental Management Based on ISO 14001

As of January 2011, the Nissan Global Headquarters and all other main Nissan facilities in Japan have acquired ISO 14001 certification for environmental management systems. We have appointed an environmental management officer to oversee our environmental activities. Through steady application of the PDCA (plan, do, check, act) cycle, we are improving our environmental performance worldwide. The coordinated goals set by the environmental management officer for the Company-wide management system are cascaded down to the employees working in all facilities through local offices.

Nissan's ISO secretariat oversees companywide efforts, while local offices in Japan are responsible for activities at each facility and division, and for coordinating the proposals submitted by employees. By engaging in discussions at least once a month, the ISO secretariat and local offices confirm progress made toward established goals, to share best practices, to improve management systems, to develop plans for the next fiscal year and to communicate requests from local facilities and divisions. The items discussed are reported to the environmental management officer twice a

year (once during the management review conference) so that Nissan can decide on needed improvements.

To confirm that management is functioning properly with respect to environmental management, we periodically retain third-party organizations to conduct audits. Additionally, to strengthen compliance, we conduct internal audits with respect to areas covered by third-party audits as well as all other environmental activities, prioritizing adherence to government reporting requirements and identifying risks. These third-party and internal audit initiatives are aimed at establishing a system capable of detecting human error, however small, and pursuing improved operations.

Nissan's production plants outside Japan have also acquired ISO 14001 certification. Nissan's policy is to establish environmental management systems in all regions where we operate in accordance with the same standards.

### Nissan's Voluntary Operational Standards

Stricter controls on environment-impacting substances are being implemented in countries around the world. Examples include the European ELV Directive, the European Union's Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Regulation, which went into effect in June 2007, and Japan's Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture. The Japan Automobile Manufacturers Association has launched a voluntary program to help minimize the potential

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release of formaldehyde, toluene and other volatile organic compounds (VOCs)\* in vehicle cabins. This program utilizes the VOC guidance value established by the Ministry of Health, Labor and Welfare for specific substances in January 2002 to be met for all new models manufactured or sold in Japan after April 2007.

Nissan is strengthening its management of environment-impacting substances, adhering to a planned schedule for their reduction and advancing the use of alternative substances. In 2005, we drew up policies regarding the use of substances scientifically recognized as being hazardous or carrying high hazard risks, as well as those identified by NGOs as dangerous. In 2007, these policies, which restrict environment-impacting substances even more than the domestic laws of the countries where we operate, were rolled out globally.

Based on the above-referenced policies, Nissan developed a specific Nissan Engineering Standard (NES) for the Restricted Use of Substances, which identifies the chemical substances whose use is either prohibited or controlled. The NES is applied in material selection and also in the components and parts used in our vehicles from initial development onward. For example, four heavy metal compounds (mercury, lead, cadmium and hexavalent chromium) and the polybrominated diphenyl ether (PBDE) flame retardant have been either prohibited or restricted in models (excluding OEM vehicles) launched globally since July 2007. To control VOC use in car interiors, Nissan adopted the voluntary targets of the Japan Automobile Manufacturers Association as our own standards for global operations, and we are reviewing and reducing the use of prohibited and controlled chemical substances in materials and adhesives for seats, door trim, floor carpet and other parts.

Every year, we revise the Restricted Use of Substances standards to reflect changes in international laws and regulations and to add new substances covered by our voluntary internal standards. For the 2017 revision, the members of the Renault-Nissan Alliance implemented shared standards based on a reassessment of select criteria for hazards and risks that go beyond the level of compliance, strengthening Alliance activities.

We build and maintain communication and management systems throughout the supply chain. For example, we disclose information to users and submit REACH reports to the relevant authorities about the vehicles and parts produced in or exported to Europe from Japan and other countries (including some from the United States). We also comply with Classification, Labeling and Packaging of Substances and Mixtures regulations.

\* VOCs: Organic chemicals that readily evaporate and become gaseous in the atmosphere.

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## Sanctions and Government Guidance at Nissan Production Facilities

During fiscal 2019, in relation to the environmental management system, none of Nissan's production facilities received notifications or sanctions from the government regarding significant violations of environmental laws or regulations.

## Raising Employee Awareness

Nissan's environmental activities are enabled by the knowledge, awareness and competency of its employees. Based on ISO 14001 standards, we will

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conduct employee education rooted in the Nissan Green Program 2022 (NGP2022) regarding CO<sub>2</sub> emission reductions, energy, water consumption and waste. In addition, education regarding environmental accident prevention and the management of hazardous materials is provided every year to all employees, including those from affiliated companies working in our production facilities. Training programs with quantitative evaluation are deployed to improve the skills and knowledge of each employee on how to reduce environmental impact in their activities. The content of these training programs is updated every year.

In Japan, we implement a curriculum to educate new employees during orientation and organize seminars for middle managers to deepen their understanding of NGP2022 and environmental issues surrounding the auto industry. We also hold “town hall” meetings to promote dialogue between executives and employees. Employees can stay up to date on our latest environmental initiatives through features in the intranet, internal newsletters and in-house video broadcasts. In addition, all employees receive an Environmental Policy Card with a pledge to pursue personal environmental activities, which they carry at all times.

Overseas, we share information and provide education to employees through the intranet, videos, events and various other communication approaches suited to each region.

## Employee-Initiated Activities and Evaluation System

In fiscal 2008, we added “environment” to the range of kaizen issues addressed by quality control (QC) circles. This has created opportunities for

employees to think proactively and propose ideas to improve environmental aspects of our business. Managers encourage the active participation of employees by communicating how these activities of QC circles are linked to the achievement of our midterm business plan. The ideas proposed by employees are evaluated by managers and QC circle secretariats for their potential contribution to environmental improvement, among other factors, after which we may implement those with the highest potential.

The knowledge and skills of the frontline employees on CO<sub>2</sub> emission reduction, energy management, water conservation and waste and landfill reduction have been compiled in a best practices manual and shared among global facilities. We hold contests in some facilities during officially designated months in Japan to keep employees motivated about participating in environmental activities. These include the Energy Use Reduction Idea Contest in February (energy-efficiency month), the Water Usage Reduction Idea Contest in June (environment month) and the Waste Reduction Idea Contest in October (3R promotion month).

We also use various methods to reward employees for their contributions to environmental improvement activities. These activities are included in the “commitment and target” annual performance goals used at some Japanese and overseas locations. This system assesses employees’ achievement of goals, reflecting this in performance-related elements of employee bonuses. Employees are also recognized for environmental improvement through Nissan prizes presented by the CEO or other executives, awards given by plant heads and “THANKS CARD” recognition from managers for excellent work or achievements.

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## Lifecycle Assessment to Reduce Environmental Impact

Nissan ensures solid environmental management policy by routinely assigning personnel to conduct risk management and having supervisors confirm their suitability and periodically conducting inspections. We also identify potential risks by conducting lifecycle assessments (LCAs). The LCA method is used to quantitatively evaluate and comprehensively assess environmental impact, not just while vehicles are in use, but at all stages of their lifecycle, from resource extraction, manufacturing and transport to disposal.

During the period of NGP2022, we are applying the LCA method to ensure steadfast implementation of our environmental activities, such as by identifying their progress and examining ways to further reduce our environmental impact. We are also carrying out LCAs for new technologies to develop environmentally friendlier vehicles.

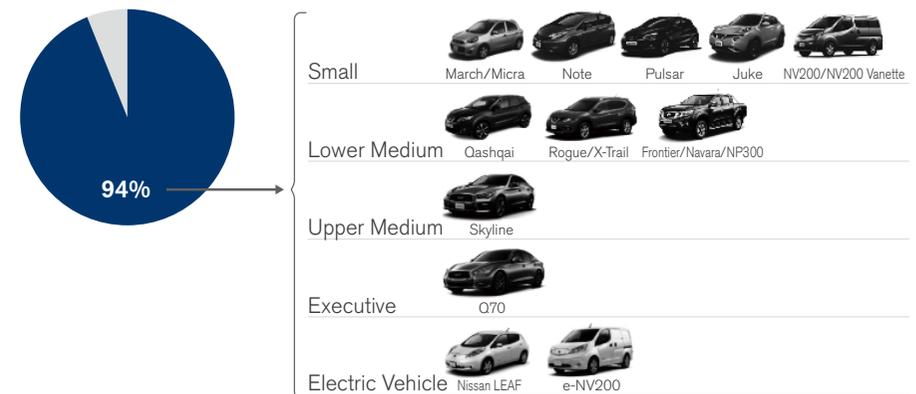
Our LCA methods have been certified by the Japan Environmental Management Association for Industry since 2010 and since 2013 by third-party TÜV Rheinland in Germany (ongoing as of November 2019). The latter certification is based on ISO 14040/14044 standards and validates the environmental impact calculations in our product LCAs.

We will use the above-certified calculations during the NGP2022 period to conduct LCAs of new vehicles and technologies and enhance efficiency during both the manufacture and operation of vehicles with the aim of further reducing environmental impact during the lifecycle of Nissan vehicles.

## Global Top Selling Model's Lifecycle Improvements

We have been expanding the application of the LCA method and enhancing the understanding of the environmental impact of our products in quantitative terms, especially our best-selling models worldwide. LCAs have been conducted for over 90% of these models.

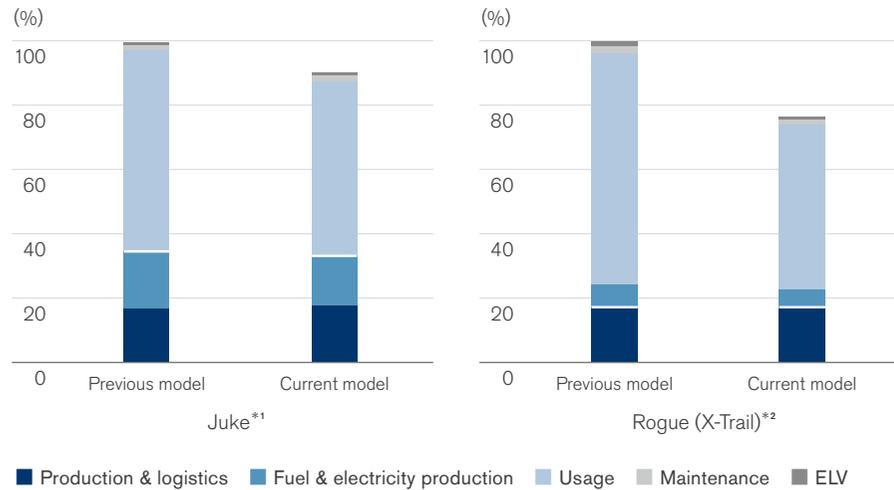
### LCA Conducted Product Ratio in Sales Volume (EU Market)



With the Altima and Rogue, for example, improvements in internal combustion engine efficiency and vehicle weight reduction have led to both enhanced safety features and lower CO<sub>2</sub> emissions.

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### Lifecycle CO2 Equivalent Emissions (CO2, CH4, N2O, etc.)



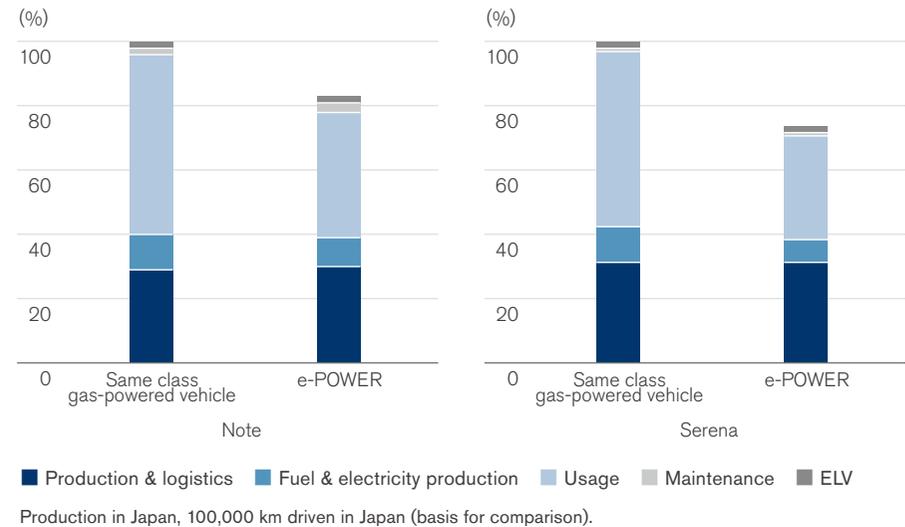
\*1 Production in EU, 150,000 km driven in EU (basis for comparison).  
 \*\*2 Production in EU, 150,000 km driven in EU (basis for comparison).

### LCA Comparison for e-POWER Models

Nissan introduced its new e-POWER powertrain in 2016, marking another significant milestone in the electrification strategy with lifecycle emission improvements. Compared to their gasoline-powered counterpart models, the Note e-POWER and Serena e-POWER have achieved an 18%—27% reduction in CO2 emissions, respectively. Electrified e-POWER vehicles use a system in which a gasoline engine operates only under certain circumstances and is

used to generate electricity. As a result, e-POWER vehicles achieve lower exhaust emissions and better fuel efficiency for driving than conventional gasoline engines. Also, since an e-POWER vehicle only requires a small battery (unlike one that is 100% electric), emissions from the manufacture of dedicated EV parts such as batteries can be kept at a level only slightly above that for parts for conventional vehicles. There is future potential for further reductions in CO2 emissions through additional weight reductions and the optimization of e-POWER energy management.

### Lifecycle CO2 Equivalent Emissions (CO2, CH4, N2O, etc.)



Production in Japan, 100,000 km driven in Japan (basis for comparison).

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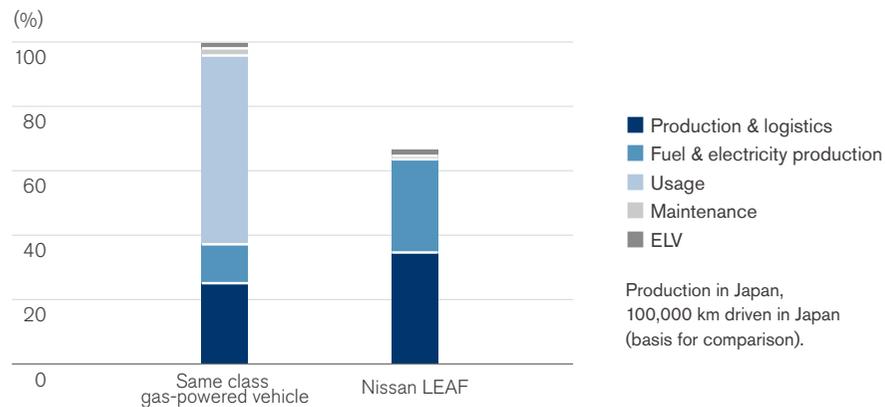
## LCA Comparison for the New Nissan LEAF

Compared to conventional vehicles of the same class in Japan, the Nissan LEAF results in approximately 32% lower CO<sub>2</sub> emissions during its lifecycle. We are making efforts to reduce CO<sub>2</sub> emissions during EV production by improving the yield ratio of materials, using more efficient manufacturing processes and increasing the use of recycled materials.

We are also continuing to pursue technology development for electric powertrains, power savings on ancillary devices and the use of renewable energy to reduce CO<sub>2</sub> emissions over the entire lifecycle of EVs.

Also, at the end-of-life stage, used batteries can be utilized for energy storage in various ways, contributing to reduced CO<sub>2</sub> emissions in society.

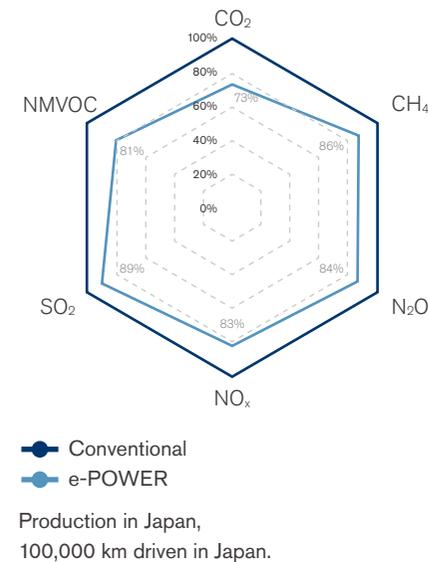
### Lifecycle CO<sub>2</sub> Equivalent Emissions (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, etc.)



## Lifecycle Improvements Beyond Climate Change

Nissan is expanding the scope of LCAs to include not just greenhouse gases but also a variety of chemicals amid growing societal concerns over air quality and ocean acidification and eutrophication. Our calculations show that, compared to conventional gasoline engines, the Serena e-POWER is significantly more environmentally friendly, achieving 11%—27% emission reductions for all targeted chemical substances and achieving environmental benefits throughout its lifecycle.

### Emissions Improvement in the New Serena e-POWER over Its Lifecycle



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## Stakeholder Engagement

### Working with Suppliers

As part of NGP2022, we are working to improve suppliers' environmental performance via the following three initiatives:

- We encourage all our global suppliers to manage parts and materials with a shared environmental philosophy in alignment with the Nissan Green Purchasing Guidelines. These guidelines are based on The Renault-Nissan Purchasing Way and the Renault-Nissan Supplier CSR Guidelines and provide information regarding environmental matters. In August 2018, based on NGP2022, we revised the content of the guidelines, adding requests that suppliers undertake their own environmental activities. Additionally, in May 2019, in order to strengthen management of environment-impacting substances, we added requirements dealing with supplier self-diagnosis of environment-impacting substance management and related topics, and asked all suppliers to follow them.
- We also participate in the supply-chain program of CDP (previously known as the Carbon Disclosure Project), an international nonprofit, through which we request information on climate change and water from suppliers and conduct comprehensive performance reviews. During fiscal 2019, we asked our large contract suppliers to take part in the supply-chain program to provide responses on their environmental activities. 83% of them participated in the CDP program on climate change data and 77% in the CDP program on water security. Based on the results from these surveys, we engaged with a number of suppliers in order to incentivize work on the ongoing improvement of their environmental initiatives.
- We are promoting THANKS (Trusty and Harmonious Alliance Network

Kaizen activity with Suppliers) activities, a joint improvement program that emphasizes trust and cooperation with suppliers. Regarding energy use (electricity and gas) and CO<sub>2</sub> emission reduction in particular, we are taking the lead in cooperating with our main suppliers as part of the energy-efficient THANKS activities, based on the initiatives of our internal production facilities.

China's environmental regulations have become more stringent in recent years, forcing many companies to discontinue their business, temporarily suspend operations or to relocate their factories. Under the circumstances, we conducted an independent survey in fiscal 2019 of suppliers' compliance with environmental regulations. The results will be utilized to build a more resilient supply chain.

### Working with Consolidated Production Companies

We encourage our consolidated production companies in a variety of markets to acquire ISO 14001 certification and to undertake other environmental initiatives based on their respective policies. Meetings with major consolidated production companies in Japan are held to exchange views on cooperation toward the goals outlined in NGP2022. The meetings lead to a deeper shared understanding of the details of NGP2022 and the initiatives undertaken by each company.

### Working with Dealerships

Our dealerships in Japan have introduced an original approach to environmental management based on ISO 14001 certification called the

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“Nissan Green Shop” certification system. This program is managed through internal audits conducted by the dealerships every six months, in addition to annual reviews and certification renewal audits carried out every three years by Nissan Motor Co., Ltd. (NML). As of the end of March 2019, the system has certified approximately 2,700 dealerships of 156 dealers, including parts dealers, as Nissan Green Shops.

## Working with Future Generations

Today’s youths are the future leaders of our society. We are working to share information on environmental issues with the younger generation, and to raise awareness among tomorrow’s leaders.

We have been conducting environmental programs for students in school visits in Japan since 2008 in which more than 100,000 students had participated as of March 2020. In NGP2022, we will further expand the program in Japan and in other countries.

## Key Activities in NGP2022

Youth education programs, such as Nissan Waku-Waku Eco School, an interactive program delivered by Nissan employees to schoolchildren, will be expanded globally to:

- Share knowledge of global environmental issues



- Introduce our environmental initiatives, such as the Nissan LEAF electric vehicle and our other green technologies  
Through environmental education, the program encourages participants to adopt eco-friendly activities in their daily lives.

## Working with NGOs

Nissan believes that environmental activities are critical in social contribution activities, thus we are engaged in various activities to realize a low-carbon society, including implementing educational programs to deepen understanding of global environmental issues. At the same time, in order to respond to the increasing complexity of environmental issues, we believe that it is effective to collaborate with NGOs, NPOs, governments and various other stakeholders to enhance these activities while making the most of our mutual strengths.

Our Corporate Philanthropy Goal is to realize a cleaner, safer and more inclusive society. NGP2022 seeks to support local communities through various projects by collaborating globally with NGOs to respond to issues such as climate change and water scarcity.

## Key Activities in NGP2022

- Collaboration with the World Wide Fund for Nature Japan (WWF Japan) on climate change mitigation  
Support for WWF Japan’s climate & energy project  
Continue participation in WWF’s worldwide Earth Hour environmental enlightenment campaign for greenhouse gas emission reduction

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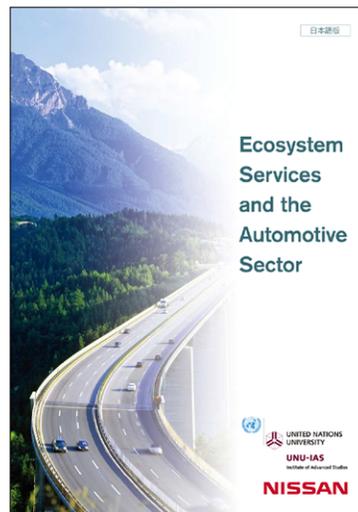
- Collaboration with Conservation International on protection of a critical watershed area
- Support for a forest restoration project through a Ridge to Reef approach in Bali, Indonesia.
- Create jobs and build capacity\* by developing community-based environmental conservation projects.

\* Build and improve capacities that groups, organizations and society need to achieve their goals

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## Priority Issues for Automobile Manufacturers Regarding the Protection of Air, Water, Soil and Biodiversity

The United Nations Millennium Ecosystem Assessment report issued in 2005 concluded that ecosystem services had degraded over the past 50 years more rapidly and extensively than in any comparable period in history. Humankind depends on a number of ecosystem services, including the provision of food and fresh water, climate regulation and protection from natural disasters. The automotive industry must recognize both its impact on ecosystems and its dependence on these services. Companies today face the pressing need to



balance environmental preservation and economic progress as they pursue their business activities.

Using methods identified in the Corporate Ecosystem Services Review, we have evaluated the value chain from the extraction of material resources to vehicle production and operation. We have identified three response priority areas as an automobile manufacturer: energy sourcing, mineral material sourcing and water usage. We published a report titled "Ecosystem Services and the Automotive Sector"\*2 in 2010 collating the outcome of this work. Our calculations in June 2013 showed that more than 20 times as much water was used upstream in the supply chain than by Nissan itself. We are following up by re-evaluating and further developing our existing environmental initiatives and ecosystem conservation efforts from the viewpoint of business risks and opportunities.

\*1 Developed by the World Resources Institute in cooperation with the World Business Council for Sustainable Development and Meridian Institute, based on the U.N. Millennium Ecosystem Assessment.

\*2 Click here for more information on " Ecosystem Services and the Automotive Sector. "  
[https://www.nissan-global.com/EN/DOCUMENT/PDF/ENVIRONMENT/SOCIAL/ecosystem\\_services\\_and\\_the\\_automotive\\_sector.pdf](https://www.nissan-global.com/EN/DOCUMENT/PDF/ENVIRONMENT/SOCIAL/ecosystem_services_and_the_automotive_sector.pdf)  
 For more information on how we are strengthening our business foundation to address environmental issues. >>> P229