RESOURCE DEPENDENCY

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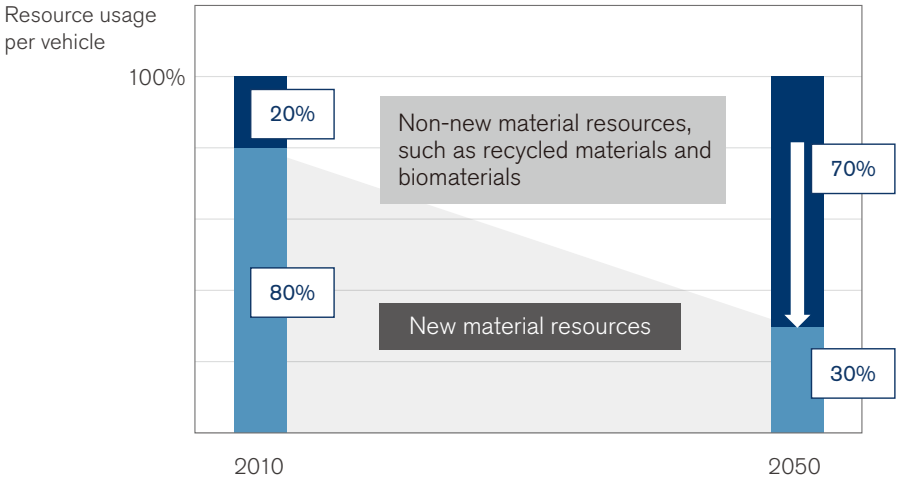
Resource Dependency Policies and Philosophy

With the world's population forecast to exceed 9 billion by 2050, demand for natural resources like minerals and fossil fuels is set to rise. This makes it even more important to maximize the value obtained from these resources. The Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 also emphasize the importance of managing resources sustainably and using them efficiently.

Automobiles are made of many components, incorporating a diverse range of resources. The combination of these resources creates new value. In addition to using resources as efficiently as possible, Nissan has increased its resource diversification and improved the proportion of renewable resources and recycled materials among them. Giving due consideration to ecosystems, we must become more competitive as we pursue green growth. Working toward the long-term vision of reducing dependency on new materials by 70% by 2050, we are striving to minimize our use of natural resources in order to maintain our new resource usage at 2010 levels.

Long-Term Vision for Reducing Resource Dependency



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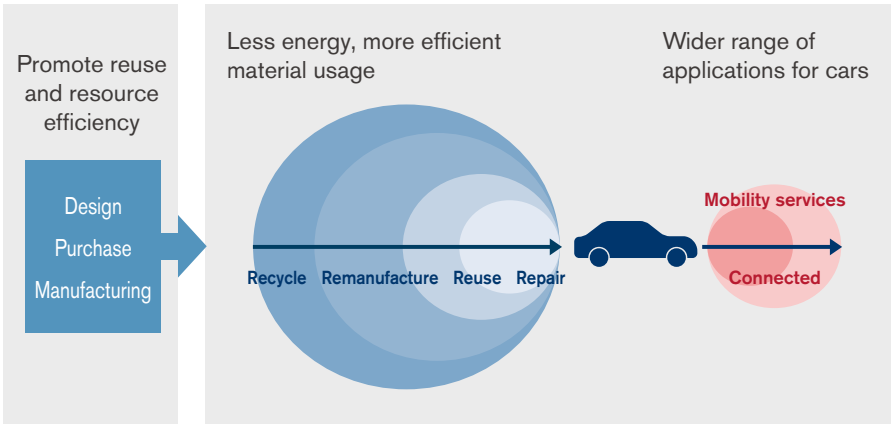
Resource Dependency Management

In order to use the Earth's precious and limited resources efficiently, the environmental impact when extracting these resources must be kept to a minimum. At the same time, waste generated during vehicle production and scrap from end-of-life parts must be recycled as extensively as possible without compromising quality, producing materials that can be used in the same types of products. Based on this approach, known as closed-loop

recycling, we have focused our efforts on recycling steel, aluminum and resin—three kinds of material which account for a large proportion of vehicle content yet also have a major impact on the environment.
As part of the Nissan Green Program 2022 (NGP2022), Nissan is developing systems for using resources efficiently and sustainably across their entire lifecycle, and has adopted the concept of the "Circular Economy" to maximize the value it provides to customers and society. In an attempt to use resources efficiently with less energy, we will promote the use of recycled materials and recycling end-of-life vehicles, and strive to incorporate reusable resources in our activities at the design, purchasing and manufacturing stages. We are using fewer resources overall, both through appropriate use of chemical substances and making vehicles more lightweight. We will continue to promote the efficient use of resources with further reduced energy requirements and the expanded use of repaired and remanufactured parts as well as the secondary use of electric vehicle (EV) batteries in the vehicle use stage, and foster the development of biomaterials and dieless forming technology for practical use. We will also increase the value cars provide to society and ensure that cars can be put to best use by promoting electrification and autonomous drive in our products, pursuing connectedness and providing mobility services such as ride sharing.

Nissan's Circular Economy Concept



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Resource Dependency: Achievements

Reducing Dependence on Newly Extracted Resources to 70%

Demand for mineral and fossil resources is rising rapidly with the growth of emerging economies. According to forecasts, if growth in extraction volumes continues, all currently known mineral resources will have been extracted by 2050. There are some existing mining sites and others under exploration that are located in areas with vulnerable local ecosystems, generating concern about the environmental effects of topsoil excavation, deforestation and wastewater.

To address these issues, Nissan has implemented a policy of minimizing the use of newly extracted natural resources and maximizing the use of recyclable materials from the early development stage while also making structural improvements to facilitate recycling. We are also reducing the use of resources in the manufacturing process and making more efficient use of resources.

In the Nissan Green Program 2022 (NGP2022), our goal is to cut the use of newly extracted resources by 30% per vehicle in fiscal 2022. We intend to increase the use of recycled materials in our vehicles on a global scale, including Japan, Europe and North America, in cooperation with our suppliers.

Initiatives to Expand Use of Recycled Materials (Ferrous and Nonferrous Metals)

In 2018, ferrous metals accounted for 61% of the materials used in our automobiles by weight. Nonferrous metals made up another 15% and resins 14%, with miscellaneous materials making up the final 10%. To further reduce our use of natural resources, we are advancing initiatives to expand the use of recycled materials in each of these categories.

We are taking steps to reduce the steel and aluminum scrap left over in the manufacturing process, and working globally with business partners to collect and reuse this scrap as material for new vehicles through closed-loop recycling initiatives. For example, we use electric-furnace sheet steel made from steel scraps in the Rogue, Murano and other vehicles produced in North America. End-of-life aluminum wheel rims are also collected for recycling to be used in new wheel and chassis components. In fiscal 2019, we collected about 3,000 tons of used wheel rims.

Initiatives to Expand Use of Recycled Materials (Resins)

In addition to our initiatives to expand use of recycled steel and aluminum, Nissan also strives to use more recycled resins.

As a closed-loop recycling initiative, we are collecting finished bumper scrap generated at our plants and sending it to our Oppama Plant, where we process it by removing the paint film and recycling it. These recycled resins have been given new life as bumpers in the Nissan LEAF and many other

Research on optimization of ASR recovered resin recycling process. Left photo is ASR, right photo is resin recovered from ASR

new vehicles. This initiative was expanded to Dongfeng Motor Co. (DFL), our joint venture in China, where they have been used to produce replacement bumpers since 2014.
Additionally, exchanged bumpers collected from dealerships are being recycled as materials used in under covers and for other components. An enhanced bumper return program allowed us to collect and recycle about 122,000 bumpers in fiscal 2019, representing 67.9% of bumpers removed at Japanese dealerships.
Furthermore, 30% of the automotive shredder residue (ASR) processed at dedicated processing plants is made up of resins. In order to use these resins in automobiles, we are running a number of R&D projects on topics like optimizing the recycling process for resins recovered from ASR, liquidation of auto waste plastic and recycling polypropylene with microbes.*

*These R&D projects are undertaken as part of our recycling optimization support business using surplus money from recycling fees deposited for three specified components (refrigerant, airbags, ASR) based on Japan's End-of-Life Vehicle Recycling Law.

End-of-Life Vehicle (ELV) Recycling

Nissan considers the three Rs—reduce, reuse and recycle—from the design stage for new vehicles. Since fiscal 2005, all new models launched in the Japanese and European markets have achieved a 95% or greater recyclability rate.*1
We have also joined forces with other automotive companies to promote the recycling of end-of-life vehicles (ELVs*2) through dismantling and shredding. Based on Japan's End-of-Life Vehicle Recycling Law, Nissan has achieved at least 95% effective recycling rate of ELVs in Japan since fiscal 2006. In fiscal 2019, we achieved a final recovery ratio for ELVs of 99.2%*3 in Japan, greatly exceeding the target effective recycling rate of 95% set by the Japanese government.
ELV processing consists of four phases. First, Nissan ELVs entering the dismantling process are recycled, including flat steel, cast aluminum, bumpers, interior plastic parts, wire harnesses and precious rare earth metals. Second, specific items like lithium-ion batteries are collected individually and directed to a dedicated recycling process. Third, residues from the dismantling process are crushed and the metallic portions recovered. Fourth, the resulting ASR is turned into recycled materials.
Since 2004, Nissan and 12 other Japanese auto manufacturers have supported ASR recycling facilities, as called for in Japan's End-of-Life Vehicle Recycling Law, as an integral part of a system to recycle ASR effectively, smoothly and efficiently. Nissan is taking an important role in this joint undertaking.
We have also established a take-back system for ELVs in Europe. This network of Authorized Treatment Facilities was developed for individual countries in collaboration with contracted dismantlers, contracted service providers and governments in alignment with a European ELV directive.
Additionally, the Japan Automobile Manufacturers Association, Inc. established a common scheme for recovering used lithium-ion batteries along with a system for processing these batteries appropriately, and put both into operation in fiscal 2018.

*1. Calculated based on 1998 Japan Automobile Manufacturers Association definition and calculation guidelines (in Japan) and ISO 22628 (in Europe).
*2. ELV is an acronym for end-of-life vehicle.
*3. Based on Nissan research

Developing Biomaterials

Seat coverings made from biomaterials in the new Nissan LEAF.

Nissan is promoting technical research to replace plastics and other resin materials used in automobiles with biomaterials derived from plants. NGP2022 contains concrete goals for biomaterials development, and these materials are already being used in cars. For example, the coverings on the seats in the new Nissan LEAF are made using biomaterials.

GRI305-7

Proper Use of Regulated Chemical Substances

Nissan revised its standard for the assessment of hazards and risks in the Renault-Nissan Alliance, actively applying restrictions to substances more stringent than existing regulations in areas of growing concern around the world. As a result, the number of substances covered by the Nissan Engineering Standard in fiscal 2019 rose to 4,069. These steps are thought to be necessary for future efforts in the repair, reuse, remanufacture and recycle loop for resources.

* Please click below for further details related to our governance system for chemical substances.

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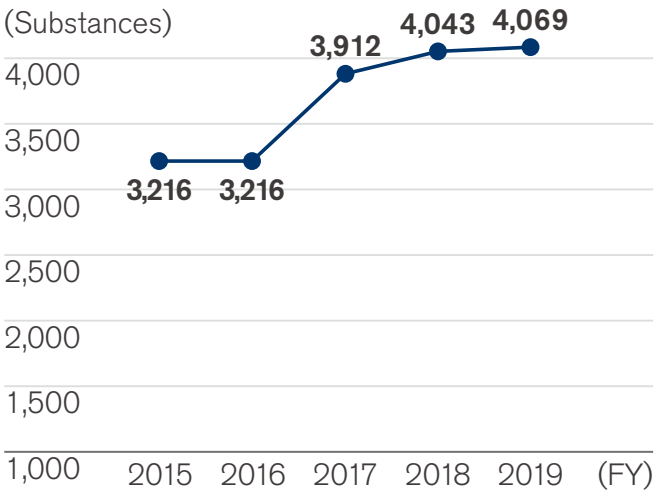
Defined Chemical Substance



Expansion of Remanufactured Parts

Parts with the potential for recycling include those reclaimed from end-of-life vehicles, as well as those replaced during repairs. In Japan, we collect and thoroughly check the quality of these secondhand parts. Those that receive a passing grade are sold through our retail outlets as Nissan Green Parts. We sell these parts in two categories: remanufactured parts, which are disassembled and have components replaced as needed, and reusable parts, which are cleaned and tested for quality before sale.
In NGP2022, we are enhancing the deployment of Nissan Green Parts

Alternator

Air conditioning compressor

Starter motor

in Japan, and we're also strengthening management to deploy similar kinds of activities in Europe and North America, aiming for twice the parts coverage in 2022 compared to 2016. This initiative provides customers who seek to use cars for a long period of time with the new option of using remanufactured parts.

Joint Venture to Promote Second-Life Use for Batteries

Lithium-ion batteries used in Nissan's electric vehicles (EVs) retain capacity well beyond the useful life of the vehicles themselves. The "4R" business model—which reuses, refabricates, resells and recycles lithium-ion batteries—allows for their effective use as energy storage solutions in a range of applications, thus creating a much more efficient energy cycle of battery use.

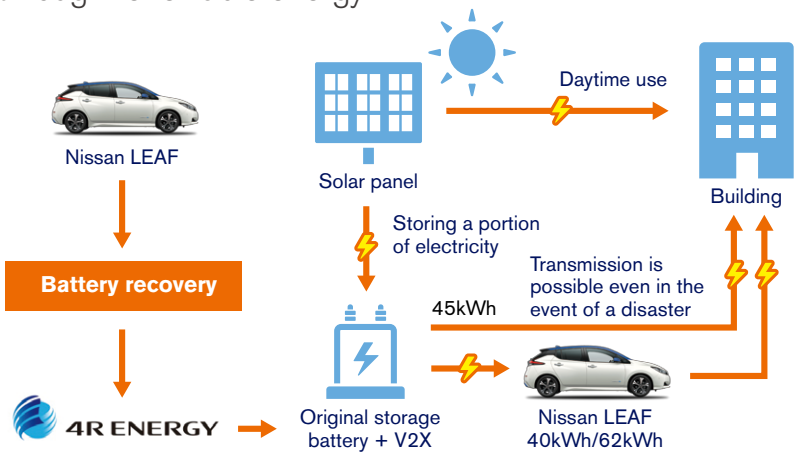
As the EV market expands, we anticipate a need to utilize reusable lithium-ion batteries more effectively. In 2010, we launched 4R Energy Corp., a joint venture with Sumitomo Corp., that is engaged in establishing EV battery reuse and refabrication technologies. With the establishment of these technologies and an increase in the number of used batteries collected, in March 2018, operations commenced at Japan's first base and plant for the reuse and refabrication of used lithium ion-batteries located in the town of Namie, Fukushima Prefecture.

4R Energy is actively engaged in the development and production of various battery storage systems built with used Nissan LEAF batteries at the Namie facility. One example of these efforts is the development of stationary power storage systems that reuse 40 kWh batteries used in the Nissan LEAF for the purpose of enhancing resiliency. Since September 2019, this reuse stationary power storage system has been used in trials for procuring electricity using renewable energy at ten 7-11 convenience stores in Kanagawa Prefecture. Additionally, in conjunction with IKS Japan Co., Ltd., we are developing new models with vehicle-to-everything (V2X) functions that can also utilize electric power from EVs, sales of which are scheduled to launch by the end of fiscal 2020.

At the same time, 4R Energy acquired the world's first UL1974*1 certification in June 2019, which is an international evaluation standard for evaluating repurposing batteries, and 4R Energy has been certified by a third-

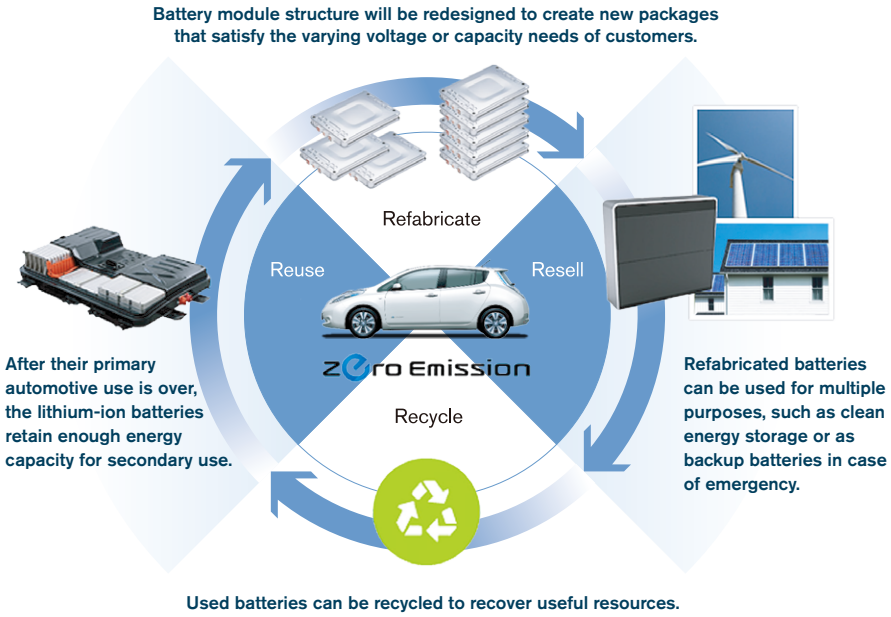
party organization for reusage and refabricating processes and product manufacturing with an emphasis on safety. Furthermore, in recognition of these activities, in October 2019 4R Energy was presented with the Frost & Sullivan*2 "2019 Strategy Innovation and Leadership Award," and in March 2020, in conjunction with Nissan, 4R Energy and Nissan won the "Sixth Annual Japan Resilience Award 2020,' sponsored by the Association for Resilience Japan*3.
We are extensively involved with 4R activities globally as well.

Overview of proof of concept for procuring electricity through renewable energy



*1. The UL1974 Standard for Evaluation for Repurposing Batteries defines the process for determining and classifying the suitability of usage when battery packs, modules or cells used to drive EVs have finished their intended period of use. Evaluating reused batteries in accordance with this process enables the provision of reused batteries that are safe and give a clear understanding of remaining capacity to meet a variety of demands.
*2. Frost & Sullivan provides research and consulting services in 80 countries and over 300 major markets through a global network of more than 40 locations.
*3. In light of the results of the National Resilience Minister's Private Advisory Committee "National Resilience Roundtable," to ensure the "Fundamental Plan for National Resilience" is executed smoothly, the Council aims to build a resilient nation with cooperation among industry, academia, government and the private sector.

4R Concept



Reducing Use of Scarce Resources

Rare earth elements are scarce resources that are necessary components of EV and hybrid electric vehicle (HEV) motors. Reducing their usage is important because of procurement challenges, as rare earth elements are unevenly distributed around the globe, and the shifting balance of supply and demand leads to price fluctuations.

Nissan is expanding its use of an electric motor developed in 2012 that requires 40% less dysprosium (Dy) compared to conventional EV motors. The motor was first adopted in the Nissan LEAF, and reduced-dysprosium motors are now seeing increased use in hybrid vehicles as well. The 2016 Note e-POWER achieves a 70% reduction in Dy in its motor magnets, and these were also adopted for the new Nissan LEAF in 2017 and the Serena e-POWER in 2018. We are conducting technical research on further reductions in the future.

As a new initiative, Nissan is also promoting the development of rare earth metal recovery technologies from drive motor magnets. Up to now, in order to recycle magnets used in motors, multiple processes including manual disassembly and removal of the magnets have been required, making economic efficiency an issue. Nissan and Waseda University collaborated to establish technologies for recovering rare earth metals in highly pure states through direct dissolution using borate as a flux, eliminating the need to dismantle the motor rotors. Going forward, we will conduct trial testing aimed at practical implementation.

In these ways, with respect to motors, which are a key technology, Nissan is engaged in developments corresponding to the circular economy concept, from reducing the amount of rare earth metals used to reuse after use, that utilize resources efficiently and sustainably.

GRI103-3

Resource Dependency: Achievements in Waste Reduction

Thorough Measures for Waste Materials

Nissan actively promotes measures based on the 3R approach in its production processes whenever possible, striving to minimize the waste generated and maximize recycling efficiency by thoroughly sorting waste. At the end of fiscal 2010, we achieved a 100% recovery rate at all of our production sites in Japan, including five manufacturing plants, two operation centers and five affiliates. Overseas, we have reached 100% rates at plants in Mexico and elsewhere. We are striving to bring rates to industry-leading levels in each global region.

We have been making great efforts to reduce the number of wooden pallets and cardboard boxes used in import and export parts shipping. We began replacing them with units made from steel more than 30 years ago, and we rolled out plastic substitutes over 20 years ago that are foldable and can be reused. We have also been working with our Alliance partner Renault to expand use of globally standardized, returnable containers. Through design activities carried out concurrently with logistics operations, we have recently considered ways to optimize the shape of parts from the development stage, thus helping to reduce the packaging materials required.

Through such efforts, we plan to reduce waste from our production factories by 2% annually in Japan and by 1% annually worldwide—as compared to business as usual (BAU), that is, waste levels expected if no special steps had been taken.

GRI306-2

Waste

Waste generated globally in fiscal 2019 amounted to 188,556 tons, a slight decrease from 206,645 tons in fiscal 2018.

Waste generated globally from production sites in fiscal 2019 was 184,573 tons.*

* This figure is subject to assurance by KPMG AZSA Sustainability Co., Ltd. For details, please see here.

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(FY)

	単位	2015	2016	2017	2018	2019
Total	ton	159,345	158,939	152,674	206,645	188,556
By region						
Japan	ton	63,630	61,115	61,327	69,829	63,315
North America	ton	49,129	45,459	35,177	64,514	57,762
Europe	ton	37,204	41,110	45,268	49,662	48,187
Other	ton	9,382	11,255	10,903	22,639	19,291
By treatment method						
Waste for disposal	ton	11,355	8,707	8,041	7,231	6,414
Recycled	ton	147,990	150,231	144,633	199,414	182,141

* For more information on Resource Dependency (Facility Waste).

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