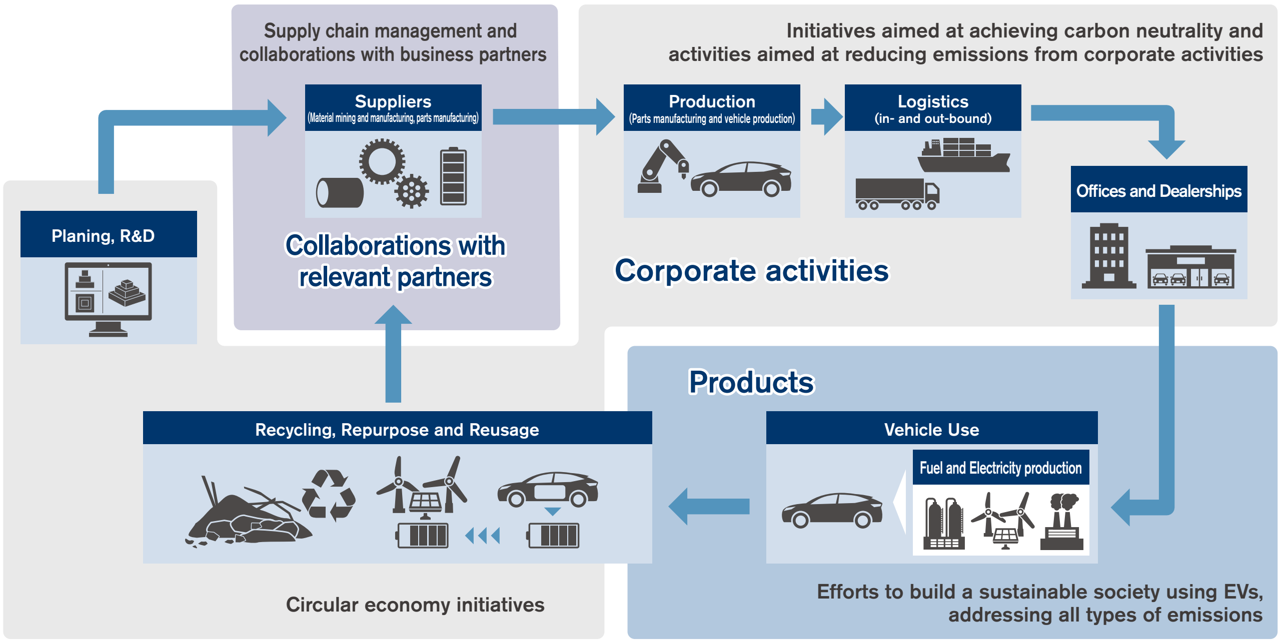
Value chain activity achievements

Nissan prioritizes climate change, resource dependency, and air quality and water, which are the key areas related to Nissan's business, to minimize dependence and impact on ecosystem services, Nissan also provides a range of value to society and provide a variety of value to society and the environment that realizes "a Symbiosis of People, Vehicles, and Nature."

This section introduces environmental initiatives and the value they create in the three main value chain business areas: Products, Corporate activities, and Collaborations with relevant partners.

Nissan Value Chain



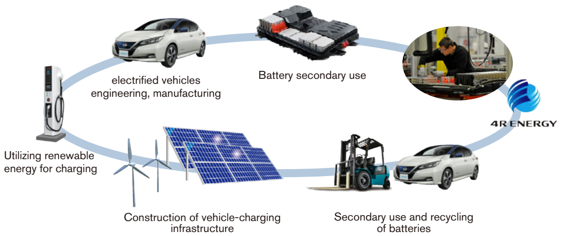
Products

Establishing a sustainable society using electrified vehicles

We consider the introduction and adoption of zero-emission vehicles to be one of the pillars of our corporate strategy. We are taking a comprehensive approach that involves boosting production and sales of zero-emission vehicles along with other activities coordinated with a variety of partners to popularize their use.

We believe electrified vehicles*1 can create a wide range of value and address various issues related to nature, such as climate change, resource dependency, and biodiversity. Furthermore, as lifestyles change and the potential for a new mobility society is emerging, Nissan is proposing both the value of mobility as a means of transportation, as well as the new value that electrified vehicles provide. We believe in these possibilities because Nissan is a pioneer in mass-produced electrified vehicles, having delivered more than 1.1 million*2 EVs (including joint ventures) to customers worldwide since the launch of the first-generation Nissan LEAF in 2010.

Initiatives for building a sustainable society using electrified vehicles



1. Initiatives in development and sales

Nissan's electrification technologies for achieving carbon neutrality by 2050

Accelerating the advancement and promotion of electrification technologies

Nissan is advancing innovations in electrification to achieve carbon neutrality. Our calculations show that electrified vehicles can reduce CO_2 emissions over their entire life cycle compared with gasoline-powered vehicles of the same class. Electrified vehicles play an essential role beyond transportation in helping to achieve a low-carbon society by contributing to the shift towards renewable energy.

Nissan has been working to advance and promote electrification technologies that can reduce CO_2 emissions by focusing on EVs and e-POWER, which have the common feature of being 100% motor-driven.

Value delivered by Nissan electrified vehicles

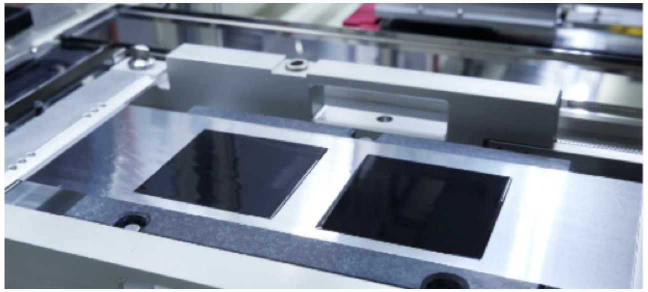
Nissan wants to deliver the ultimate driving experience that only electrified vehicles can offer. We aim to create exciting driving experiences that can only be realized with 100% motor-driven vehicles, eliminating the potential stress that accumulates unnoticed in daily driving. For example, e-Pedal Step provides responsive acceleration when the accelerator is depressed and smooth deceleration via motor regeneration when the accelerator pedal is released. In addition, e-4ORCE is an unprecedented electrically-driven all-wheel control technology that integrates the control of two high-output motors (front and rear) and brakes. It allows for the flexible control of driving power, enhancing handling in all types of conditions, from daily driving to winding roads and slippery road surfaces.

We are also actively working on technical developments to make electrified vehicles more affordable, aiming to achieve prices that are comparable with those of conventional engine-powered vehicles as soon as possible.

Technological innovations supporting the spread of electrified vehicles

EV battery development initiatives

All-solid-state batteries are expected to be a game-changing technology for accelerating the popularity of EVs. They have an energy density approximately twice that of conventional lithium-ion batteries, significantly shorter charging times due to superior charge/discharge performance, and the potential to reduce battery costs by reducing rare metal usage. With these benefits, Nissan expects to use all-solid-state batteries in a wide range of vehicle segments, including pickup trucks, making its EVs more competitive. Nissan has been developing this technology and aims to bring it to market by 2028.



*1 Electrified vehicles: Electrified vehicles including e-POWER, EVs: Electric vehicles (excluding e-POWER)
*2 As of March 31, 2024.

Next-generation powertrain X-in-1

In March 2023 Nissan unveiled its new approach to electrified powertrain development, which it calls X-in-1.*1 Under the approach, core EV and e-POWER powertrain components will be shared and modularized, resulting in a 30% reduction, compared with 2019, in development and manufacturing costs by 2026.
We are currently developing a 3-in-1 module for EVs comprising three components (motor, inverter, and reducer). We are also working on a 5-in-1 module that expands upon the components of the 3-in-1 module. In addition to the motor, inverter and reducer for e-POWER vehicles, 5-in-1 includes a generator and an increaser.

Common use of components and elemental technologies

As EV and e-POWER, the two pillars of Nissan electrification, have many similar specifications required for motors and other core components, we have achieved a high degree of commonality by promoting designs based on the assumption of common usage.
For example, the internal components of the inverter have been standardized between the Nissan LEAF and Note e-POWER (2016), and this standardization has now been expanded to the Nissan Ariya, Nissan Sakura and other e-POWER models.
We implemented common motors between the Nissan LEAF and Note e-POWER (2016) and now we are expanding the use of common motors across the entire lineup, including e-POWER rear motors and Nissan Sakura front motors, while also working to reduce costs.

Technologies for downsizing of key components in electrified vehicles

In terms of the advances from the first- to second-generation e-POWER in Note e-POWER, we doubled output density by both downsizing the inverter and increasing its output. This was made possible by the technologies that Nissan has cultivated over many years of in-house inverter production. While ensuring the high quality required for vehicles, these technologies also take into account trade-offs in terms of heat and insulation, achieving space savings in terms of millimeter units. Going forward, we will work to further improve the power density of inverters by combining ongoing advances in the miniaturization of power semiconductors with the miniaturization of substrates supported by in-house production, as well as through the use of silicon carbide (SiC) .

Dedicated engine design efforts focused on power generation

Nissan is also working on the development of engines focused on power generation based on its Strong Tumble and Appropriately stretched Robust ignition Channel (STARC) concept. In conventional driving power transmissions, thermal efficiency is limited to approximately 40% to accommodate output characteristics that cover a wide range of driving loads. On the other hand, engines focused on power generation, such as the e-POWER, enable the engine usage range to be limited to the most efficient point. This breakthrough uses the engine in full fixed-point operation, enabling a dramatic improvement in thermal efficiency, leading to the development of a technology realizing thermal efficiencies of up to 50%.

Light weight technology

Along with improving the efficiency of batteries, engines, and electric powertrains, reducing the weight of vehicles is important for carbon neutrality.
Nissan is working on weight reduction from three points of view: Materials, structural optimizations and manufacturing processes.

Materials

Nissan is rapidly expanding the use of Ultra-High-Tensile Steel, which realizes high strength and formability while also reducing weight. This material is used for the body frame components on a wide range of vehicle models, from “kei” cars to the INFINITI. In 2018, we adopted 980 megapascal (MPa) Ultra-High-Tensile Steel with High Formability, which features further improvements in collision energy absorption performance, for the INFINITI QX50, and in 2019 SAE International presented Nissan with the “SAE/AISI Sydney H. Melbourne Award for Excellence in the Advancement of Automotive Steel Sheet,” among other accolades. In 2020, we expanded the application of this material to the Rogue, Qashqai, and Note, then to the Nissan Ariya in 2022 and Serena in 2023.

Structural optimizations

The e-POWER system, which integrates motors and inverters, was adopted in the 2020 Note, achieving a 6% increase in output while reducing the weight of the motor by 15% and the inverter by 30%. The same technology was used in the Nissan Sakura in 2022 and Serena in 2023.

Manufacturing processes

Nissan is engaged in the practical application of a new casting method called the vacuum low-pressure die cast process (V-LPDC). This method was applied to the 1.5-liter, 3-cylinder turbo engine cylinder head of the Rogue and Qashqai, contributing to a 4% weight reduction.

Nissan will continue proactively developing lightweight technologies to reduce CO_2 emissions to achieve carbon neutrality.

*1 Click here for more information on "X-in-1". https://global.nissannews.com/en/releases/nissan-e-power-tech-x-in-1

Global promotion of electrification

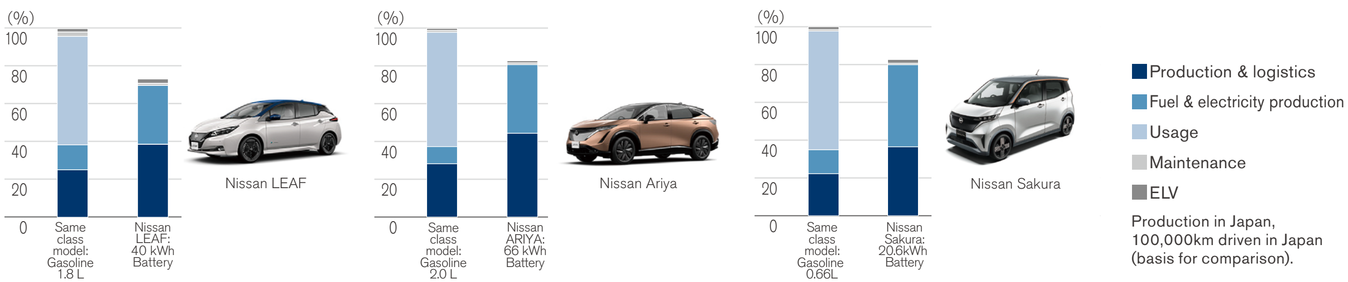
Electrified vehicle performance and assessment

Since the launch of the Nissan LEAF in 2010, Nissan has been expanding and promulgating its battery EV and e-POWER models. In 2022, Nissan developed the Nissan Sakura for the "kei" car segment, achieving powerful, smooth acceleration and quietness that surpass the traditional boundaries of "kei" cars and winning the 2022-2023 Japan Car of the Year award, 2023 RJC Car and Technology of the Year awards, and 2022-2023 Japan Automotive Hall of Fame Car of the Year.
e-POWER, an electrified vehicle realizing low carbon emissions through the utilization of existing infrastructure that provides a driving experience not unlike that of an EV, e-POWER forms part of Nissan's global promotion of electrification. It has been installed in the Sylphy and X-Trail in China, the Qashqai and X-Trail in Europe, and the Kicks and X-Trail in Mexico. In Mexico, it is classified by the government as an EV and is eligible for various preferential EV policies. Equipped with the newly developed, exclusively designed e-POWER engine, the Serena received the 2023-2024 Japan Technology Car of the Year award in 2023 and the 2024 RJC Car and Technology of the Year awards for improved combustion efficiency, smooth and powerful acceleration, and outstanding quietness.

LCA*1 of EV models

Nissan conducts life cycle assessment (LCA) to quantitatively evaluate and comprehensively assess environmental impact. The Nissan LEAF's lifecycle CO_2 equivalent emissions have been reduced by approximately 30% compared with conventional vehicles of the same class in Japan. The Nissan Ariya and Nissan Sakura, launched in 2022, further improve EV product appeal and reduce environmental impacts. Compared with Japanese gasoline-powered vehicles in the same class, the lifecycle CO_2 equivalent emissions of the Nissan Ariya and Nissan Sakura have been reduced by approximately 20%. Nissan will continue to pursue the potential for further reducing the environmental impact of EVs throughout their lifecycle.

Lifecycle CO_2 equivalent emissions



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

Lifecycle CO_2 reduction on the Nissan Ariya

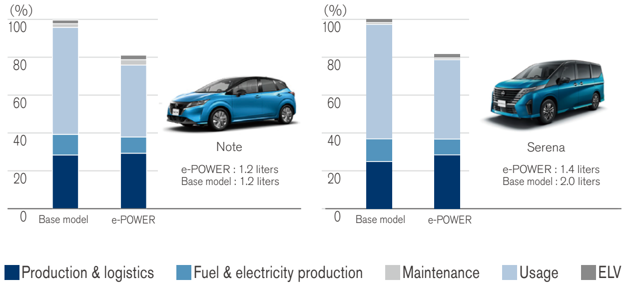
In Nissan Ariya production at the Tochigi Plant, we have intensified our efforts to minimize CO_2 emissions at every stage of the vehicle's lifecycle.
In the production stage, we contributed to the reduction of CO_2 equivalent emissions through ongoing efforts that included increasing the yield of materials and utilizing recycled raw materials. Following the introduction of the Nissan Intelligent Factory*2 method at the Tochigi Plant in 2021, we are actively working towards making all of our production plants carbon neutrality. To achieve this, we are focusing on promoting innovative practices that enhance production efficiency during vehicle assembly, improving the efficiency of energy and materials utilized in our plants, electrifying plant equipment, and utilizing renewable energy sources. These efforts are aimed at reducing carbon emissions and creating a more sustainable manufacturing process for Nissan vehicles.
To reduce environmental impact in vehicle use, Nissan is continually reducing CO_2 emissions by improving the efficiency of electric powertrains, including batteries, saving power on accessories and increasing renewable energy usage.
Nissan is actively promoting the reuse of vehicle batteries*3 as a stationary battery for distributed power supply, enabling the storage of renewable energy and contributing to the decarbonization of society.
Nissan will keep working to reduce the environmental impact from the entire life cycle of electric vehicles.

*1 Click here for more information on environmental data of LCA. >>>P157
*2 Click here for more information on the Nissan Intelligent Factory. >>> P045
*3 Click here for more information on the reuse of vehicle batteries. >>> P042

LCA of e-POWER models

Nissan introduced its new e-POWER powertrain in 2016, marking another significant milestone in the electrification strategy with life cycle emission improvements. For example, the Note e-POWER, Nissan Kicks e-POWER, X-Trail e-POWER, and Serena e-POWER have achieved approximately 20% reductions in CO_2 emissions compared with their gasoline-powered counterpart models.
e-Power models use a system in which the gasoline engine operates only for generating electricity under specific conditions. As a result, e-POWER models achieve better fuel efficiency for driving than conventional gasoline engines with less engine displacement.

Lifecycle CO_2 equivalent emissions



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

Technical developments meeting different needs

Fuel-cell electric vehicles

Powered by electricity generated from hydrogen and oxygen, fuel-cell electric vehicles (FCEVs) are zero emission vehicles that do not produce CO_2 or other harmful emissions. We believe that, as part of building a sustainable mobility society, both FCEVs and EVs are viable options from an energy diversity perspective.
In alignment with Japanese government policies, we joined forces with Toyota Motor Corporation, Honda Motor Co., Ltd., and other companies to establish Japan H2 Mobility, LLC (JHyM), targeting the full-fledged development of hydrogen stations for FCEVs in Japan. Addressing the key issues raised during the initial stage of FCEV promotion, JHyM will ensure that infrastructure developers, automakers, and investors all do their part to support the successful strategic deployment of hydrogen stations and effective operation of the hydrogen station business in Japan.
In June 2016, Nissan unveiled its e-Bio Fuel-Cell system that runs on bioethanol electric power. The new system features a solid oxide fuel-cell (SOFC) power generator. SOFC technology can produce electricity with high efficiency using the reaction of oxygen with multiple fuels, including ethanol and natural gas. SOFCs can run on a variety of fuels, enabling the use of existing fuel infrastructure, and have the advantage of presenting relatively low hurdles in terms of infrastructure adoption.
Because our technology combines the efficient electricity generation of SOFC with the high energy density of liquid fuels, it can enable driving ranges on par with gasoline-powered vehicles.
Commercial users that require higher uptime for their vehicles should increasingly be able to take advantage of this solution thanks to the short refueling times it offers.

Commercial vehicle electrification

We are also advancing the electrification of commercial vehicles to achieve carbon neutrality.

History of commercial electric vehicles at Nissan
In June 2014, Nissan launched the EV multipurpose commercial van e-NV200 in European countries and Japan. The e-NV200 has power outlets in two locations drawing up to a total of 1,500 W of electricity from the onboard engine for electrical generation, which can be used to secure power on the road during normal operation, on the go in business, for leisure activities, as well as a power source in the event of a disaster. On construction sites, noise problems can be alleviated as there is no need to use an engine-powered generator. In Europe, Nissan is proposing a concept combining comfort and practicality to enhance outdoor activities in winter with the e-NV200 Winter Camper concept making it possible to charge the 220-volt battery using solar panels mounted on the roof.
In 2020, the Tokyo Fire Department began using a zero emission EV ambulance based on the NV400. Nissan thinks quiet, low-vibration EV ambulances have strong merits. As this vehicle is also equipped with two lithium-ion batteries providing 33 kWh and 8 kWh, it is possible to operate electrical equipment and air conditioners for longer periods of time. It also enables these ambulances to be used as mobile power sources in the event of a power outage or disaster.
In 2022, Nissan pursued quality and functionality with the launch of the Townstar, based on the Renault-Nissan-Mitsubishi Alliance CMF-C platform. The Townstar can flexibly handle delivery operations in urban areas.
In 2024, Nissan launched the Clipper EV in Japan. This light commercial van ensures the necessary cargo space and load capacity. It delivers powerful performance unique to electric motor-driven EVs, enabling swift transportation of heavy cargo.

Nissan will continue to expand its lineup of electric commercial vehicles and promote the manufacture of commercial vehicles with Zero emissions.

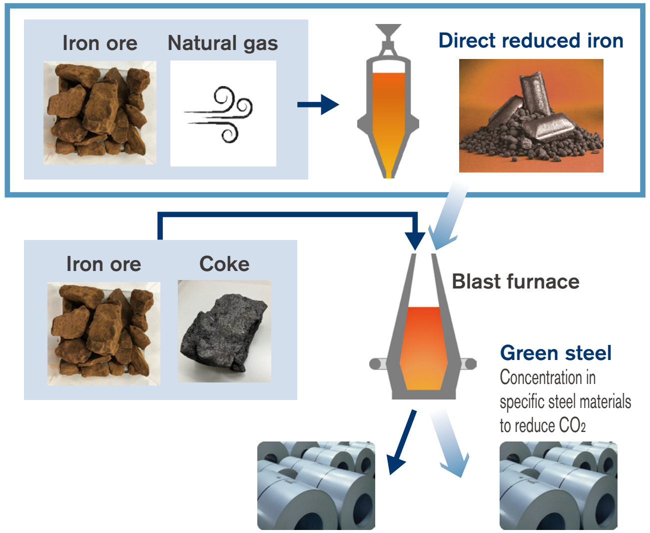
As a mobile power source, the e-NV200 has a range of business applications.
(Production of the e-NV200 has ended.)

Zero-emission EV ambulance based on the NV400

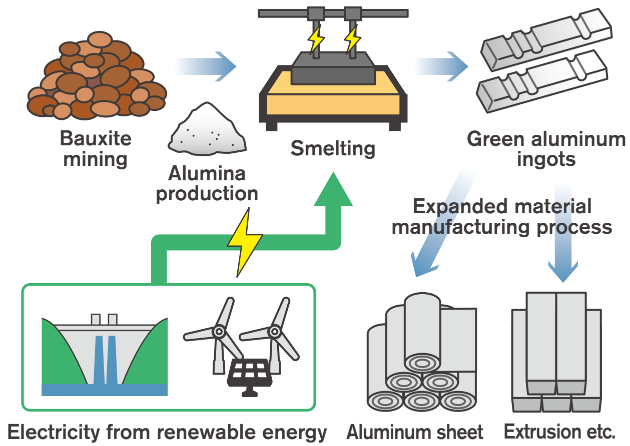
Efforts to reduce CO_2 emissions during parts manufacturing through use of green steel and green aluminum

Since approximately 60% of a vehicle's weight is made up of steel parts and around 10% of its weight is made up of aluminum parts, the use of green steel and green aluminum is a very effective way to reduce CO_2 emissions during parts manufacturing, which is part of the vehicle's life cycle. In collaboration with Kobe Steel, Ltd., Nissan has been utilizing green steel*[1] and green aluminum*[2] for Nissan vehicles since January 2023, which not only contributes to the significant CO_2 emission reductions during manufacturing, but also maintains the same level of high quality as conventional products. The adoption of steel materials that achieve a 100% reduction in CO_2 emissions during the manufacturing process using the mass balance approach*[3] is a first for mass-produced vehicles and will be gradually implemented across Nissan's lineup.
In addition, we will further reduce CO_2 emissions during manufacturing by promoting closed-loop recycling*[4], which also utilizes recycled materials generated at Nissan production sites.

Green steel：Mass balance approach



Green aluminum



*1 Green steel: Low-CO_2 blast furnace steel with significantly reduced CO_2 emissions in the blast furnace process
*2 Green aluminum: Aluminum that is electrolytically smelted using only electricity generated by solar power and other renewable energy sources, thereby reducing CO_2 emissions during aluminum ingot production by approximately 50%.
*3 Mass balance approach: Within the product manufacturing process, this is a method for assigning characteristics to parts of a product when raw materials with certain characteristics (e.g. low-CO_2 products) and raw materials without said characteristics are mixed, depending on the amount of raw materials with said characteristics. The CO_2 emission reduction effect is concentrated in specific steel materials.
*4 Closed-loop recycling: The reuse of aluminum or steel sheet scraps generated during manufacturing as materials with same quality and reuse in similar products. Click here for more information on aluminum recycling. >>> P052

2. Utilizes reusable energy during charging

Launch of 100% renewable energy EV charging service at Nissan dealerships and other facilities

As part of our efforts to create a zero-emissions society utilizing EVs, 100% of the electricity used for quick charging at Nissan dealers in Japan and Nissan facilities has come from renewable energy sources since September 2023.*1

Providing virtually 100% renewable electricity to employees

Since 2019, some Nissan dealers in Japan have been selling virtually 100% renewable electricity on behalf of electric power companies to encourage EV users to charge at home. We are actively engaged in conducting various demonstration experiments for the utilization of EVs in collaboration with electric power companies. This includes exploring the potential use of EVs in social energy management, such as establishing a business model that leverages the large-capacity batteries installed in vehicles to maximize the utilization of renewable energy resources.
From the beginning of fiscal 2022, we began providing Nissan employees residing in the Kanto area with electricity derived from virtually 100% renewable electricity .
This initiative is a step to decarbonization taken by Nissan as an EV pioneer, not only producing and selling EVs, but also throughout product lifecycle. We are committed to work with everyone toward the realization of carbon neutrality through a wide range of activities.

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3. Collaboration with energy infrastructure

Energy ecosystem utilizing EVs

Nissan energy: Renewal of solutions that enrich life and society with EVs

In addition to manufacturing and selling EVs, Nissan is promoting the development of Nissan Energy, a solution that provides customers a more fulfilling life with EVs. Nissan EV ecosystem was established by combining these two activities.

Nissan Energy is offered in the following three areas:
· Expansion of charging solutions
· Energy management utilizing electric vehicles
· Promotion of 4R for second-life use for lithium batteries

NISSAN ENERGY

*1 When quick charging using the Nissan Zero Emission Support Program 3 (ZESP3), a charging support program for owners of electric vehicles (Evs). Click here for more information on 100% renewable energy EV charging service at Nissan dealerships and other facilities. (Japanese only) https://www.nissan.co.jp/EV/CHARGE_SUPPORT/ZESP3/renewable_energy.html

Expansion of charging solutions

Various electric charging solutions are provided to enable customers to enjoy safe and convenient lifestyles with EVs.
Charging at home is the most convenient charging method, as it is completed while the car is parked at home. For safe charging at home, Nissan selects and mediates companies that install dedicated EV outlets and chargers for charging at home.
For both the Nissan LEAF, which has a cruising range sufficient for everyday use, and the Nissan Ariya, in which occupants can enjoy long-distance trips, drivers can further enjoy their trips to distant places with peace of mind by utilizing the expanding network of public charging stations. Nissan app provides a convenient and seamless charging experience by offering features such as locating and monitoring the availability of public charging stations, route planning with consideration of charging locations, and the payments of charging fees.
Further, we have adopted more user-friendly standards for public charging stations in consideration of both customer charging behaviors and targeted EV models in each region. In the United States, beginning in model year 2025, we have made the Nissan Ariya compatible with NACS, which is the Tesla charging standard and has the highest number of quick-charging stations in the network.
We also offer charging experiences tailored to the needs of customers in Europe and Japan.

Energy management utilizing electric vehicles

The electricity stored in a Nissan EV's battery can do more than just power a vehicle; it can be shared with homes, buildings, and local communities through bi-directional chargers.
Using inexpensive electricity in the evening during off-peak periods and excess electricity generated by solar panels during daytime reduces electricity costs and helps promote a model of local generation of electricity for local consumption. In Japan, EVs also provide backup power during blackouts or emergencies.
Local communities can connect multiple EVs to regional powergrids to charge or discharge electricity in accordance with power supply and demand balance, which contributes to the stability of a community's power supply and promotes renewable energy use. EVs with high-capacity batteries are expected to play a significant social infrastructure role by storing renewable energy such as solar power which power generation is difficult to control.

Nissan Energy Share x Hiroshima University

Hiroshima University and Nissan will begin a large-scale energy management program on the Hiroshima University campus utilizing Nissan EVs. The program will support Hiroshima University in realizing a carbon neutral smart campus through the adoption of 100% EVs and the local production and consumption of 100% renewable electricity through energy management. The introduction of Nissan Energy Share is the first case study conducted by the Hiroshima University Smart City Co-Creation Consortium. Each party will continue to work together closely to expand the Hiroshima University model across Japan and achieve true carbon neutrality.

V2X

Nissan's Vehicle-to-X (V2X) is a technology that efficiently utilizes the electrical energy stored in the batteries of electric vehicles by extracting and sharing it with homes, buildings, and society via bi-directional chargers.

Renewable energy sources, such as solar and wind power, are essential to realize carbon neutrality. However, power generation from these sources fluctuates depending on weather conditions, which can lead to surplus or shortage of electricity supply in relation to demand. Maintaining a stable supply and demand balance thus presents a challenge.

V2X technology enables the absorption of power fluctuations generated from renewable energy sources by charging and discharging them to EV batteries. The value and potential of V2X is expanding through the stable utilization of valuable renewable energy, the promotion of renewable energy introduction, and usage as a backup power source during disasters, etc..

Promotion of 4R for second-life use for lithium batteries

Nissan EV batteries offer high performance even after being used in cars. As more and more customers switch to EVs, the supply of batteries capable of secondary use is expected to increase significantly.
In 2010, Nissan, as an EV pioneer, joined forces with Sumitomo Corporation and established 4R Energy Corporation, which specializes in secondary use of lithium-ion batteries. The intention is to promote the four Rs of lithium-ion batteries — reuse, resell, refabricate, and recycle — and establish a battery circular system which will enable the efficient use of resources.

Circular system realized with used EV batteries

The market for used batteries will expand with the spread of EVs and their utilization will become an issue in the future. To solve this issue, 4R Energy Corporation has promoted the development of technologies for the reuse of used batteries at its plant in the town of Namie, Fukushima Prefecture. Used batteries collected from the market are sorted according to their condition and performance and supplied to various secondary users. Through these activites, we are building a business model to return value to customers, such as increasing the residual values of EVs based on the value of reused batteries. Expanding this model into a business and further reducing the hurdles to EV ownership for customers will lead to the further spread of electric vehicles.

4. Addressing all forms of emissions

Addressing emissions

Promoting zero-emission vehicles

EVs such as the Nissan LEAF, which has cumulative global sales of approximately 680,000 units (as of the end of March 2024), are an effective tool for reducing air pollution in urban areas. As a leader in this field, we are promoting zero-emission mobility and infrastructure construction in partnership with national and local governments, electric power companies, and other industries.

Enhancing internal combustion engines

We have proactively set voluntary standards and emission reduction targets for internal combustion engines. With the ultimate goal of making automotive emissions as clean as the atmosphere itself, we have developed a wide range of technologies and achieved the results listed below through cleaner combustion technologies, catalysts for purifying emissions, and countermeasures against gas vapors from gasoline tanks.

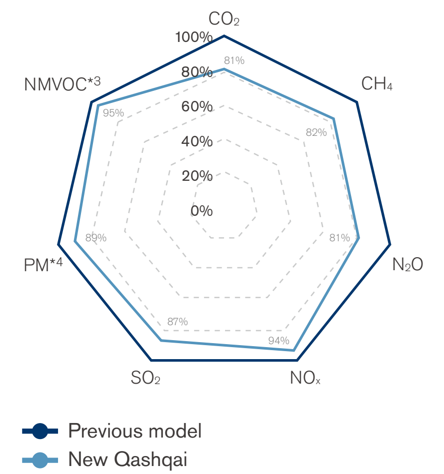
- Sentra CA (released in the U.S.A. in January 2000): The world's first gasoline-powered vehicle that satisfied all the exhaust gas requirements set by the California Air Resources Board to receive Partial Zero Emissions Vehicle (PZEV)*1 certification.
- Bluebird Sylphy (released in Japan in August 2000): The first passenger vehicle made in Japan to achieve Ultra-Low Emission Vehicle (U-LEV)*2 certification.

We will continue our efforts to ensure cleaner exhaust emissions from internal combustion engines.

Lifecycle improvements beyond climate change

Nissan is expanding the scope of lifecycle assessment (LCA) to not only greenhouse gases but also a variety of chemicals. Our calculations show that the new Qashqai achieves emission reductions of 5-20% for all targeted chemical substances and reduces environmental impacts throughout its life cycle compared with the previous model.

New Qashqai lifecycle assessment (LCA)



Production in EU, 150,000 km driven in EU.

*1 PZEV: Certification set by the California Air Resources Board
*2 U-LEV: Vehicle that produces 75% less nitrogen oxide (NOx) and nonmethane hydrocarbon (NMHC) than the 2000 emission standards level in Japan.
*3 NMVOC:Non-Methane Volatile Organic Compounds
*4 PM:Particulate Matter

Compliance with air quality emissions regulations (Passenger cars only)

Nissan not only works to develop and promote zero-emission EVs but continues to promote cleaner exhaust emissions from all of its engines.
For example, the Qashqai released in Europe in October 2018 has a fuel-efficient 1.3-liter turbo gasoline engine fitted with a particulate filter that meets the Euro 6d-Temp emissions standard. In Japan, our product with electrification technology, e-POWER has achieved a 75% reduction in exhaust emissions from 2018 standards and improved fuel economy. As part of these efforts, our compliance with air quality emissions regulations goes far beyond current legal requirements to meet more stringent specifications. The following table shows the status of compliance with emissions regulations by region.

Compliance with exhaust emissions regulations (By region) *1

(FY)

Country/Region	Standard	2023
Japan	50% lower than 2018 standard	89%
Europe	Euro 6d	100%
U.S.A.	U-LEV / SULEV / ZEV	100%
China	National 6	100%

Addressing emissions other than vehicle exhaust

In consideration of impacts on people and nature, Nissan is broadening its efforts to address vehicle emissions beyond exhaust emissions to include wear from brakes, tires, and various other sources.

EVs use regenerative braking to charge their battery with electricity generated, thereby reducing wasted energy and improving electricity efficiency. This also reduces brake wear, contributing to improved air quality as well as climate change mitigation.
As the next proposed European exhaust emission regulation, Euro 7, will regulate particulate emissions from brake wear etc.. Nissan has begun exploring technologies to address this issue.

Improving in-cabin air quality

Under the circumstances of widespread advanced driver assistance systems and the development of fully autonomous driving technologies, it is expected that drivers will spend more time in their vehicles, making it even more important for that space to be pleasant and safe.
Nissan conducted research and development aimed at cleaner vehicle emissions and made efforts to improve the cabin environment, including better air quality, to enhance comfort. As part of these efforts, starting with specification enhancements in April 2021 for the Nissan LEAF, several vehicle model interiors are equipped with materials providing verified*2 antibacterial properties. As part of our continued efforts to reduce volatile organic compounds (VOCs)*3 such as formaldehyde and toluene, Nissan is further reviewing materials for seats, door trims, floor carpets, and other parts as well as adhesives.
Having voluntarily set more stringent standards globally than those of any country's government and automotive industry body regulations, we have applied them to all new vehicles introduced to the market from July 2007 onward.

*1 Passenger cars only.
*2 Results were verified using specific bacteria and usage environments, and are not guaranteed to be effective against all bacteria.
*3 VOCs: Organic chemicals that readily evaporate and become gaseous under normal temperature and pressure conditions.