





Protecting the Environment

Symbiosis of people, vehicles and nature

The most important challenge of our time is to achieve industrial development while preserving the natural environment and alleviating environmental problems. Nissan continues to pursue an innovative approach to environmental activities. We consider a wide range of options and dedicate ourselves to developing technologies which will be effective today as well as in the future thus promoting vehicles with a low environmental impact.

Nissan's Perspective

Aiming to achieve a symbiosis of people, vehicles and nature

Conservation of the global environment is the most important challenge in our pursuit of sustainable development.

The global environmental problems we face today as an automobile manufacturer are complex and diverse.

We cannot pass these problems on, unsolved, to future generations.

What challenges are Nissan taking on today to meet the demands of society?

While clearly defining the key challenges which the future lays before us, we will continue to take a sincere and innovative approach to our environmental activities.

Three Key Issues for Nissan

Managing CO₂ emissions; protecting the air, water, and soil; and recycling of resources

We firmly believe that a sincere environmental policy is at the core of sound business practice. Nissan places a high priority on effective environmental management. What impact are our corporate activities and the products we provide having on the natural environment? Understanding this and considering what is expected of Nissan by society, Nissan has identified three key issues, which we regard with particular importance. They are: managing CO₂ emissions, protecting the air, water, and soil; and recycling of resources.

Managing CO₂ emissions

Nissan works proactively to manage CO₂ emissions from our plants, and to introduce technologies that reduce the amount of CO₂ emitted from our vehicles in use. We regard this to be an issue of strategic importance for the company. In our factories, we have increased energy efficiency significantly through the introduction of numerous energy saving measures, including co-generation facilities. As to our vehicles, the introduction of new engine and transmission technologies and our investment in clean energy vehicles are some of the major efforts being taken in order to reduce CO₂ emissions. We are now in the process of establishing a global strategy for CO₂ management, as described below.

Please see our Environmental Report for additional details on our environmental activities.



Protecting the Air, Water, and Soil

Nissan believes that as an automobile manufacturer with global operations, it is important to identify key future challenges and take a proactive stance in finding solutions. One example is our approach to clean emissions technology. Nissan has placed a high priority on clean emissions, and today we have achieved a level of emissions for our vehicles that is much lower than the one stipulated by Japanese law.

It is our approach not only to develop such technology, but to enable it to be widely used.

We also work diligently to ensure the highest standards of chemical and waste water management at our plants and offices to avoid adverse impacts on the surroundings (→ P37). This is another cornerstone in our efforts to protect the air, water and soil.

Recycling of Resources

Automobiles are manufactured using the earth's finite natural resources. In order to be able to recycle precious resources, Nissan works not only as an individual corporation but also in partnership with society. When it comes to the implementation of recycling activities, we develop local approaches that conform to the laws, regulations and industrial circumstances of each country in which we operate.

If we increase production at our plants, this will inevitably generate more waste. We make every effort to circulate materials looking at the full chain of vehicle production.



Nissan's Challenge

Looking at the vehicle life cycle as a whole

To respond to the three key environmental challenges, Nissan is pursuing wide-ranging technological development while looking at entire life cycle of a vehicle.

In every aspect of our corporate activity, we evaluate the demands of society today and in the future and analyze numerous possibilities for action. This ongoing effort yielded considerable progress in 2004, some examples of which are described below.

Managing CO₂

Reduction of CO₂ Emissions from Cars in Use

Development of CVT, hybrid and fuel cell vehicles

Our technological development is based on the recognition that CO₂ emitted from our corporate activities and from our vehicles in use is an important issue.

In technological development, Nissan takes two basic approaches. One is focused on the future, making strategic investments in the development of clean energy vehicle technology. The other is more focused on the present, introducing readily applicable technology into an increasing number of our vehicles.

Nissan has taken a comprehensive approach to CO₂ reduction, developing fuel-efficient engines, highly efficient transmission systems, lightweight vehicle bodies as well as more aerodynamic vehicles with low air resistance. We are also making significant progress in the technological development of clean energy vehicles such as hybrid electric vehicles and compressed natural gas vehicles. Currently in Japan, we are striving to meet the 2010 Japanese government-mandated fuel economy standards by 2005.

Increase in vehicles fitted with CVT (continuously variable transmission)

CVT is one of the technologies that can enhance fuel efficiency. Nissan first introduced CVT to its passenger vehicle range in 1992 with the application of the N-CVT to the March compact car. Since then, Nissan has been at the forefront of global CVT innovation. We are currently the only manufacturer in the world to offer a full CVT lineup for small, medium and large class passenger vehicles.

Nissan introduced a third generation CVT to the Murano crossover SUV in the US in December 2002, followed by its application in the Teana luxury sedan in Japan in February 2003. This was the world's first front-wheel-drive/all-wheel-drive 3.5-liter CVT — called XTRONIC CVT. This technology contributes significantly to a smooth acceleration and improved fuel efficiency under ordinary driving conditions. In the Lafesta minivan, which Nissan released in December 2004 in Japan, CVT technology combined with Nissan's new gasoline engine and other improvements, enabled a fuel efficiency that is 37% better than existing vehicles of the same class*.

Introducing CVT more widely will help reduce CO₂ emissions. To offer more customers worldwide the benefits of CVT, Nissan plans to sell around 1 million CVT-fitted models worldwide by fiscal year 2007, up from an estimated 250,000 in fiscal year 2004. If around 1 million CVT-fitted models were sold, this would have nearly the same effect in terms of CO₂ emissions reductions as selling 200,000 hybrid electric vehicles.

Please see our Environmental Report for additional details on our environmental activities.



Altima Hybrid — prototype



CVT (Continuously Variable Transmission) enables a smooth, continuous transmission which not only enhances acceleration, but which also improves fuel economy for better environmental performance



2005 Model X-TRAIL FCV

This will raise the proportion of CVT-fitted vehicles to around 24% of global sales volume, up from 7% at present. In Japan, the ratio will rise to 50% and in the US 40%

* This is based on a comparison between new and old model vehicles. The average actual fuel efficiency improvement was calculated according to Nissan's in-house standards that look at various real-world driving conditions, including congestion, city and express way driving.

Hybrid Electric Vehicles

The major advantages of hybrid electric vehicles as environmentally friendly vehicles are their low CO₂ emissions and clean exhaust gas. With ongoing improvements in driving performance, the demand for hybrid electric vehicles as attractive vehicles for the 21st century is expanding.

Nissan has prioritized the development of hybrid technology as one of the technologies that will lead us toward the realization of a zero emissions society in the future. As a first step, we developed our so-called Neo Hybrid system, which was first used in the Tino Hybrid model released in April 2000. Aiming to encourage the further spread of hybrid electric vehicles by lowering the cost of hybrid-vehicle components, Nissan in September 2002 signed a technological cooperation agreement with Toyota Motor Corporation. In June 2004, less than two years after signing the basic agreement, we built the Altima Hybrid (prototype). Nissan will further refine the vehicle based on this prototype and will start production of the Altima Hybrid in 2006. Nissan will continue to develop hybrid vehicles as a key technology to deliver

new value to customers while improving environmental performance.

Fuel Cell Vehicles (FCV)

The fuel cell vehicle (FCV) is expected to play an important role as a clean energy vehicle. The greatest feature of the FCV is that the sole emission is water, produced through the generation of electric energy in a chemical reaction of hydrogen and oxygen. The Nissan FCV employs elements of a variety of technologies, including electric vehicle (EV), hybrid electric vehicle (HEV), and compressed natural gas vehicle (CNGV) technology. Nissan embarked on FCV development in 1996. Limited leasing sales of the 2003 X-TRAIL FCV model was launched in 2003 in Japan. In March 2004, Nissan delivered the first X-TRAIL FCV to Cosmo Oil Co., Ltd. The two companies have broadened their relationship beyond that of supplier and user of FCVs, undertaking joint research and development efforts on hydrogen fueling at the interface between hydrogen supply and use. In April 2004, X-TRAIL FCVs were delivered to Kanagawa Prefecture and the City of Yokohama in a joint effort to promote clean vehicles.

In February 2005, Nissan announced that it has designed and developed its first in-house fuel cell stack. Nissan has succeeded in increasing power output while achieving a more compact design than the previous stack. Nissan's new stack can be reduced in volume to approximately 60% of the previous stack while providing the same level of power. Improvements made to electrode materials more than double the service life of



Nissan's first fuel cell stack developed in-house. A fuel cell stack is a device which produces electricity through the chemical reaction of hydrogen and oxygen in the atmosphere.



Installation of cogeneration systems using exhaust heat from power generation (Japan)

the new stack compared with Nissan's previous stack. Also, the possible operating conditions such as the allowed temperature range of the stack for producing electricity have been expanded. This newly developed 70 MPa high-pressure hydrogen storage cylinder increases the hydrogen storage capacity by approximately 30% compared with the previous 35 MPa cylinder, without any change to the cylinder's dimensions. This increased storage capacity can dramatically extend the driving range of an FCV. The 2005 model of the X-Trail FCV, which employs these two technologies, is scheduled for completion in fiscal year 2005.

Issues that must be addressed to support the widespread use of FCVs include cost reductions and the implementation of a fuel supply infrastructure. Resolving these and other related issues will take some time. Nissan is progressively working to further the diffusion of FCVs through continued technological development and our participation in Japanese and US road trials.

Activities in Manufacturing Toward global CO₂ management

Automobile manufacturing processes require large amounts of energy. Most of this energy is currently generated by fossil fuels which generate CO₂ emissions. Nissan is promoting energy conservation activities through the improvement of both facilities and operational procedures.

One example of energy saving deriving from new equipment is the cogeneration systems we have installed in our plants in Japan, which make effective use of waste heat produced by in electricity generation. In fiscal year 2003, we achieved a 12% reduction in CO₂ emissions compared to fiscal year 1999. Compared to 1990, the reference year for the Kyoto Protocol, this represents a 43% reduction. However, we must take further effective measures to reduce CO₂ while the number of vehicles we produce continues to grow. We are reconsidering our previous practices and establishing global policies for the management of CO₂. We will continue our CO₂ reduction efforts, considering how to add natural energy sources such as solar or wind generation to our energy options.

Activities in Distribution Enhanced efficiency and modal shift

It is not possible to consider manufacturing without taking into account the role of logistics. Here, a difficulty with truck transport, the major logistical mode we use today, is that it is a major generator of CO₂. Nissan pursues efficiency in truck transport as a way of reducing the CO₂ emitted in the transportation of finished vehicles, production parts and parts for maintenance as well as introducing modal shift, which shifts freight to rail and sea transport. These transportation modes generate less CO₂ than trucks.

Please see our Environmental Report for additional details on our environmental activities.



Modal shift to ferry transport (Japan)



Modal shift to rail transport (Japan)

Since 2000 in Japan, Nissan has switched from the transport methods previously used for procurement of parts from suppliers, which simply delivered the parts to plants, to a system in which we retrieve our shipments directly from the supplier, reducing waste and increasing the loading ratio. Before this initiative, nearly 2,500 10-ton trucks delivered components to Nissan every day, now the number is only 2,200.

Nissan has developed 55 different kinds of versatile, proprietary containers suited to the shape of the contents for more efficient loading. Additionally, we have introduced folding containers. Measures including also reducing the use of containers have yielded an improvement of approximately 10% in the loading ratio in Japan. We have also developed a packing shape evaluation system that assesses whether the shape of items to transport allow for rational and efficient stacking when loaded. This system will in the future be introduced globally.

In Japan, we employ modal shift when moving finished vehicles and parts to distant destinations, replacing road transport with marine and rail transport. In particular, we

are maximizing the use of modal shift between the Kanto region and Kyushu and in fiscal year 2004, 1% of our total part transactions in Japan will be carried by rail — double the rate of the preceding year, and approximately 5% of our total freight volume will be carried by ferry. We expect such efforts to reduce CO₂ emissions by around 70% for transportation over these routes.

On the global level, components from different parts suppliers are consolidated and transported to our plants. Nissan, which has plants in the UK and Spain, has established a joint purchasing operation with Renault, which has plants in France and Spain. In addition, we cooperate with Renault in ferry transport of finished cars between the UK and the European mainland. Nissan has also been cooperating with other manufacturers in the transport of finished cars between the UK and the European mainland since January 2004. When manufacturers send finished cars from Europe to the UK, the ships return empty. However, Nissan, which has plants in the UK, needs to ship in the opposite direction. Since both sides want to avoid empty return trips, we aligned interests to make this possible.

Wind farm plans for our UK plant

Nissan Motor Manufacturing (UK) Ltd. is situated in Sunderland, in the rich natural environment of the northeast of the United Kingdom. Adjacent to the plant site is a natural pond visited by migrant birds. We are working to protect the flora and fauna of the area and coexist with nature in various ways, including the provision of artificial ponds.

The plant acquired ISO14001 certification in 1998. We aim to step up our efforts for environmental conservation and are planning to build a wind farm at the plant. This would be the first wind farm within the Nissan Group. We conducted a survey among local people before preparing the plan and found that over 80% were in favor of the

introduction of wind energy. We will install seven 750kW turbines, which will cover 7% of electrical demand on the site (equivalent to electrical power for 2,600 households) when all are in operation. The project is expected to reduce CO₂ emissions by approximately 10,000 tons per year.



Sentra CA (USA)



The Bluebird Sylphy, the first vehicle in Japan to receive certification as a SU-LEV in 2003

Protecting the Air, Water and Soil

Cleaner Exhaust Emissions Achieving a U-LEV ratio of more than 90% of cars sold in Japan

To protect the air, water and soil, we are continuously working to achieve cleaner exhaust gas emissions. Here, it is also our approach to provide cleaner cars to as many customers as possible by introducing effective technology quickly and at a reasonable price. This reflects our two-pronged approach of progressive technological development and rapid technology diffusion.

Starting in 1970 with compliance with the Muskie Act in the US, followed by the introduction of the first emissions regulations in Japan, Nissan made a quick response in providing vehicles complying with regulations. Currently, our cleanest gasoline vehicle has reached emissions levels that are between 1/100 and 1/250 of the levels originally called for by these regulations.

Clean exhaust emissions technology of world top class

Nissan has become a world-class company in terms of our efforts in clean exhaust emissions technology. Nissan embarked on U-LEV* development in 1995. We believe that the clean emissions technology improvements that we have achieved were made

possible because of our long history with catalyst development.

When Japan's Ministry of Land, Infrastructure and Transport established the rating system for U-LEV standards in 1999, Nissan vehicles were among the first to qualify.

In 2000, we began sales of the Sentra CA in California (USA), the world's first gasoline vehicle to receive PZEV* certification by the California Air Resources Board (CARB). Nissan pushed the exhaust emission development even further when the Bluebird Sylphy became the first car ever to be certified as a SU-LEV* — a super ultra-low emission vehicle in Japan, with exhaust levels some 75% lower than the level prescribed in 2005 exhaust emissions standards.

* U-LEV: A vehicle that emits 75% fewer exhaust emissions of nitrogen oxide (NOx) and hydrocarbon (HC) than the level prescribed in the year 2000 exhaust emissions standards.

* SU-LEV: A vehicle that emits 75% fewer exhaust emissions of nitrogen oxide (NOx) and nonmethane hydrocarbon (NMHC) than the level prescribed in the year 2005 exhaust emissions standards.

* PZEV: Partial Zero Emission Vehicle as established by CARB.

Achieving U-LEV ratio of more than 90% of cars sold in Japan

Technology for environment conservation can be highly effective when its use becomes widespread.

If 80% of passenger vehicles sold in Japan by Nissan were U-LEVs, this would have nearly the same effect in terms of NOx and HC emissions reductions as selling 400,000 electric or other zero emission vehicles. Nissan has been proceeding with vigorous measures to prevent

Please see our Environmental Report for additional details on our environmental activities.



Note, SU-LEV certified for the entire product line-up (Japan)



Lafesta, achieving a recoverability rate of more than 95% (Japan)

air pollution under the Nissan Green Program 2005, a medium-term environmental action plan that was announced in January 2002. Under this program, Nissan set a goal of having 80% of all its passenger cars sold in Japan emit 75% fewer exhaust emissions than the 2000 exhaust emission regulations by the end of March 2003. That goal was accomplished ahead of schedule in February 2003. As of March 2004, more than 90% of our gasoline vehicles sold in Japan were U-LEVs. For the future, we plan to further increase our efforts and have set a new objective for March 2006 to make 80% of our gasoline vehicles sold in Japan certified as SU-LEVs.

Recycling of Resources

Car Building that Considers All Stages up to Recycling

Achieving a recoverability rate of at least 95%

For many years, we have been conducting extensive research on dismantling and recycling end of life vehicles (ELVs). The experience gained through this research has now been linked to activities at the development stage of new vehicles. This process considers steps from the vehicle's design stage to its end of life in a joint, cross-departmental approach. This kind of collaborative effort is an essential part of the recycling process as is the building of partnerships with dismantlers.

Dismantling Research

We have conducted our own proving trials of car dismantling with dismantlers and relevant industries developing various dismantling methods and tools. In order for other dismantlers to be able to introduce the same approach, we disclose the workflow, facilities, technology and cost, and we received approximately 5,500 visits by recyclers and the general public to our test plant in the 7 years from 1997 to 2004. This functions as a center for disseminating information on vehicle recycling. The airbag processing equipment created in the course of the research has been adopted as a process tool under the Automobile Recycling Law in Japan.

Recoverability rate in new models

We develop products with the goals of ease of recycling (recoverability rate), ease of dismantling at the end of life stage (dismantling efficiency), material identification markings for plastic parts (plastic parts marking rate), and reduction of environment-impacting substances. Nissan achieved a recoverability rate of more than 90% for all of its vehicles sold in Japan since 1999. We are now working toward realizing 95% recoverability rate for all new models sold in Japan by 2005, a level already met by the March and Cube models released in 2002 and also by the Lafesta released in 2004. Starting with the release of Note in 2005, we aim to reach a recoverability rate of at least 95% in all new models sold in Japan, and we will continue our development work towards still higher goals.

★Recoverability rate: This value is based on Nissan's own calculation standard



The amount of ASR generated from a single March vehicle (previous model)

The Work of the ASR Recycling Promotion Team

Nissan has entered into an alliance with ten companies including other automobile manufacturers, called the Automobile Shredder Residue Recycling Promotion Team (ART), which sets transaction standards for ASR, considers designated

transaction sites and examines recycling methods. We will continue our efforts to reach the ASR recycling rate target for fiscal year 2005, which is set at 30% in the Automobile Recycling Law in Japan.

Zero Emissions Activities Achieving a total recycling rate of 99.2%

Looking at the entire "chain" of activities in a vehicle's production, we pursue every opportunity to recover and recycle resources. An increase in automobile production leads to an increase in waste production. In view of this reality, Nissan is promoting company-wide activities geared toward zero emissions of waste from our plants. As a result, Nissan has successfully attained zero landfill volume* and a total recycling rate* of 99.2% in Japan. The reduction of waste for incineration made possible by this zero emissions approach has freed up surplus furnace capacity in for example our Oppama Plant, thus making possible the thermal recycling of automotive shredder residue (ASR).

Nissan's zero emissions activities are limited to Japan. We are faced with the issue of how to find methods to re-circulate materials in a situation where each country presents different circumstances for recycling. We are currently considering ways to use the expertise gained in Japan in our production centers around the world.

*Zero landfill volume: Reducing the volume of waste that goes directly from plants and business offices to landfills to less than 1.0% of the 1990 level.

*Total recycling rate: The percentage of recycled waste including heat recovery of the total amount of waste generated.

Challenges Facing Vehicle Recycling Success in recycling ASR

Currently in Japan, we have achieved a vehicle recovery rate of approximately 80%. The remaining 20% includes substances that cannot be separated or recycled, such as plastic and glass, which are landfilled. It has become necessary to develop ways to recycle ASR in preparation for the Automobile Recycling Law that has come into effect in Japan in January 2005.

From 1997, prior to the establishment of the Automobile Recycling Law in Japan, Nissan has worked on the recycling of ASR which presents a problem in energy recovery because of its high heat index. We rebuilt part of our waste incineration facilities at the Oppama plant, tested and achieved solutions to technical problems and started energy recovery of ASR in the fall of 2003.

It was the first time any carmaker had used existing incineration facilities at its own plant to process ASR. The vapor generated by the process will be used for heating in the paint process and elsewhere, making the plant an energy conservation leader. The technology and know-how adopted by Nissan could be applied at other waste incinerators, and we are working to share this expertise making the information widely available.

Please see our Environmental Report for additional details on our environmental activities.



ASR recycling facility (Japan)



Recycling simulation system, "OPERA"

Major Recyclable Parts on the Note

