2 Environmental Performance

1 Product Development

In order that we can achieve a cleaner automotive society, we are promoting both the ongoing development of environmental technologies in our products, and the use of efficient, optimized product development in achieving a reduction in the environmental impact of all our business activities. In addition, we are contributing towards the realization of a sustainable and recycling-based society.

Hiroyasu Kan
Senior Vice President, Technical Center Environmental Management Sub-Administrator, Director in Charge of Environmental and Safety Engineering Dept.

1. Environmental Management in Product Development

Environmental Management Organization for the Technical Center

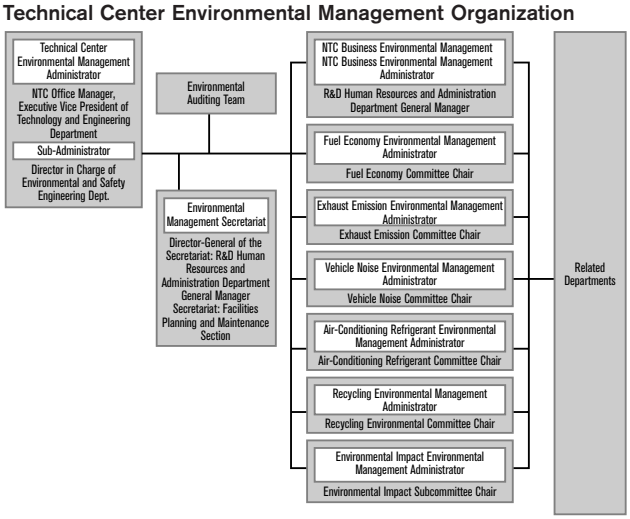
Overall Technical Center Environmental Management is the responsibility of the Executive Vice President of the Technology and Engineering Department, who promotes comprehensive environmental improvement activities covering both products and business activities.

First of all, in order to reduce the impact of products that may impose a high impact on the environment, Nissan has a departmental structure overseen by the product environment committee that specifies important environmental measures, based on six environmental impact evaluation categories. These are fuel consumption (CO_2), emissions gas, external noise, air conditioner refrigerant, environmental impact substances, and recycling. Each Environmental Management Administrator determines and promotes environmental objectives based upon the product environment committee, and the coordination of all related vehicle development projects means we have made steady progress in both enhancing performance and achieving goals.

Secondly, from the FY 2002, the area of responsibility for activities such as resources and energy savings, and for environmental risk management throughout the Technical Center has been expanded. This is being promoted on a per-department level, and lies with Environmental Management Administrators. In each department, we are working to attain our goals through the use of environmental improvement activities that include shortening of the product development period and optimization of development testing materials.

In the FY 2003, we are aiming to create world class, environmentally friendly technology and environmental performance, and on a regional level, we are aiming to reduce the environmental impact. In addition, we are promoting continued improvement in environmental management, with all employees working towards contributing to the environment when carrying out their own business activities.

Technical Center Environmental Management Organization



Environmental Policy in the Technical Center

Accompanying the expansion of environmental management for the Technical Center into a unified products and business activities system, we have reformed our environmental policies.

"Symbiosis of People, Vehicles and Nature"

As the global R&D operation in Nissan Motor CO., Ltd, we utilize top-level environmental technologies and make the most of initiative of individuals, address continuous environmental improvement activities and contribute to the realization of the sustainable society to protect our global environment.

1. **Our efforts toward clean production**
   To realize a clean automobile society, we will assess environmental impact in all stages of a vehicle life cycle and continuously develop environmental technology.
   We will especially focus our efforts on making improvements in important environmental fields, including enhanced fuel efficiency (reduction in CO_2 emissions), which will contribute to curbing global warming.
2. **The promotion of business activities symbiosis with the environment**
   All business activiies will be rationalized and made suitable, in order to minimize the pressure towards the environment, and to contribute to the symbiosis.
3. **Individual voluntarily activation to improve the environment**
   Through environment education and enlightenment, we hope to deepen the individual awareness of improving the environment so it will relate to voluntary actions.
4. **Maintain Transparency to the Society**
   We will promote two-way communication with our stakeholders so that our corporate activity should remain transparent to the society.

In order to execute all of the above-mentioned, we will surely conform ourselves to laws, ordinances and other regulations. We will also set our specific targets and continue systematic efforts in preventing environmental issues.

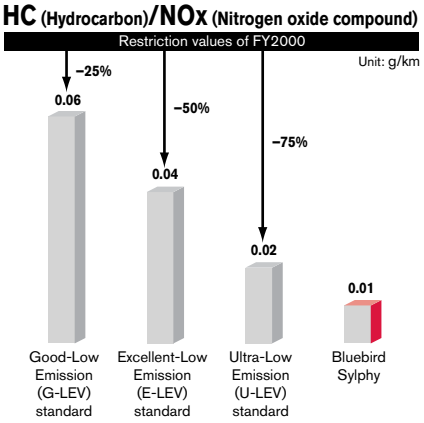
2. Reduction of Exhaust Emissions

Nissan established the Exhaust Emission Committee in December of 1990 to actively promote the research and commercialization of technologies to purify automobile exhaust emissions, such as engine modifications, improvements in control technology and catalyst systems, and other post-discharge cleaning systems.

Low Emission Technology of Gasoline Engines

Super Ultra Low Emission Vehicle (SULEV) certified Sentra CA (Clean Air), sold in the United States since February 2000, is the world's first gasoline Vehicle to receive Zero Emission Vehicle credit from the California Air Resources Board (CARB) as it met all other requirements including zero evaporative emission from the fuel system and the on-board diagnosis level 2(OBD-II).
From the 2003 MY (model year), we are increasing in the number of Nissan vehicles that support these requirements. In Japan, we have further improved the technology used in the Sentra CA and introduced the Bluebird Sylphy, with a more than 50% reduction of emissions from the Japanese "Ultra-Low Emission Vehicle (U-LEV)" standard, set by the Ministry of Land, Infrastructure and Transport.

Exhaust Emissions of Bluebird Sylphy

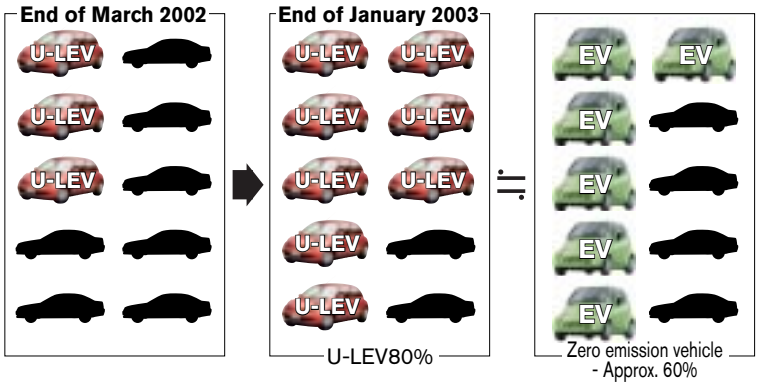


Bluebird Sylphy

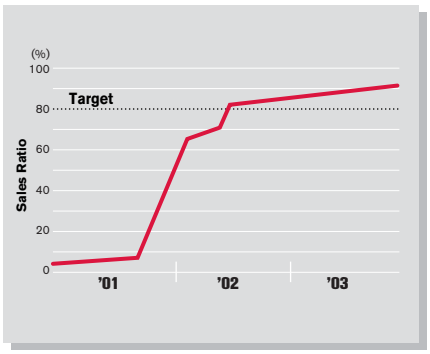
TOPICS Increasing Ultra-Low Emission Vehicles (U-LEV)

U-LEV is an environmentally friendly vehicle with exhaust emissions as clean as about one-fourth of the level of NOx and HC of cars certified for 2000 Japanese exhaust emission standards. Introducing 80% of U-LEV passenger cars annually in Japan has the equivalent effect, in terms of reducing NOx and HC, to disseminating 400,000 vehicles zero emission cars, such as fuel cell vehicles and electric vehicles, annually. Our priority is to employ practical technology that enables us to realize a wide dissemination of U-LEVs at affordable prices to make an immediate contribution to environmental preservation.
In January 2002, Nissan announced the "Nissan Green Program 2005", mid-term environmental action plan, which covers comprehensive environmental preservation activities, including products, technology, and recycling. The company has been promoting the increased usage of U-LEV passenger cars sold in Japan, and sales for the year ending January 2003 exceeded 80% of all vehicles sold, meaning the target of the plan was reached 2 months ahead of schedule.

Benefit of increasing Ultra-Low Emission Vehicles (U-LEV)



U-LEV Sales Ratio in Japan



U-LEVs sold in FY 2002

Fairlady Z

Cube

Elgrand

Skyline Coupe

Teana

Moco

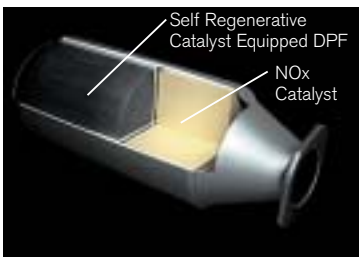
Low Emission Technology of Diesel Engines

Compared to gasoline engines, diesel engines have a number of unique advantages—lower CO_2 emissions, better fuel economy, higher torque performance and greater energy conservation. Nissan is working to make its diesel engines even more cleaner and more efficient. Nissan uses direct injection and the new Nissan Modulated Fire (M-Fire*) combustion technology to both reduce CO_2 emissions, and to realize previously unattainable minimum levels of noise, NOx, and smoke emissions.

Caravan

In particular, the "Caravan," our flagship commercial vehicle, was quick to comply with the demands of the "Automotive NOx and PM Law" enacted in October 2002, and in addition to being the only vehicle in its class to meet these stringent emissions standards, its economic efficiency and practical, powerful engine have met the demands of a wide number of customers. We are taking an active role in working towards the future, by way of such activities as holding a reference exhibit at a motor show of the self regenerative DPF (Diesel Particulate Filter). This uses a catalyst, and is one of our diesel emissions gas reduction technologies.

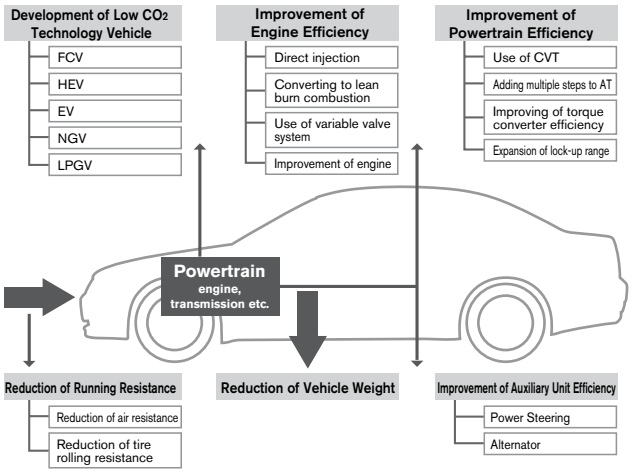
* M-Fire Combustion: Low temperature pre-mixture combustion, based on optimization of fuel injection timing, the creation of strong swirl, and large volume EGR.



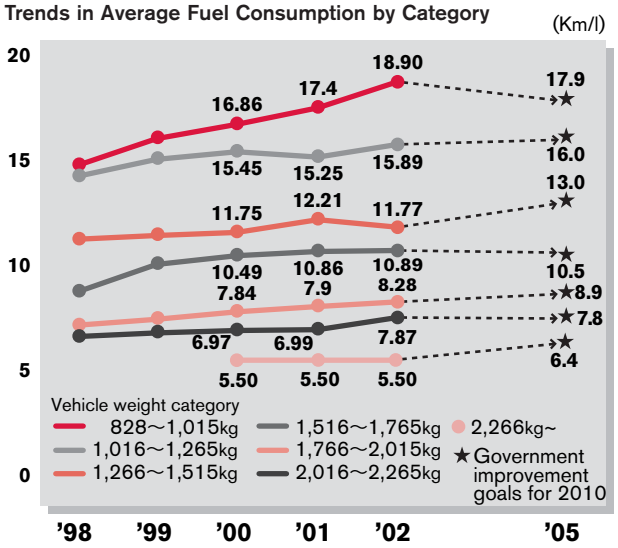
"Self Regenerative Catalyst Equipped DPF" and "NOx Catalyst" (Exhibited for reference at the 34th Tokyo Motor Show)

3. Improvement of Fuel Economy

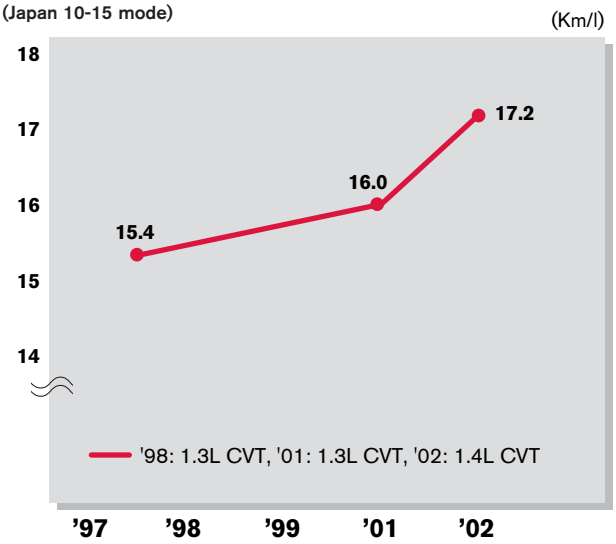
In November 1989, Nissan established the "Fuel Economy Committee" (currently referred to as the Fuel Economy Subcommittee), which has been carrying out comprehensive research, development, and commercialization, with the aim of promoting improvements in fuel economy (reduction in CO_2 emissions). We aim to achieve voluntary fuel economy standards which reflect Japan's 2005 standards for diesel vehicles and 2010 standards for gasoline vehicles, as well as standards set by other countries. In Japan, as one of the goals set by the Nissan Green Program 2005, we strive to meet the 2010 fuel economy standards by 2005, five years ahead of the original schedule. In 2002, we achieved these in 3 out of 7 corresponding weight categories.



Trends in Average Fuel Consumption by Category



Trends in Fuel Consumption for the Cube
(Japan 10-15 mode)



Efforts in Europe

In Europe, diesel engines' popularity is gaining, thanks to their lower CO_2 emissions (compared with petrol engines), higher torque, higher energy efficiency and, hence, even more environmentally friendly.

The Alliance with Renault has enabled Nissan to significantly expand the engine line-up to better cater to the diversified market demand for diesel vehicles in Europe. For example, the Micra and the Almera are now powered by a Renault 1.5 liter or a Nissan 2.2 liter diesel engine, and the Primera is fitted with a Renault 1.9 liter or a Nissan 2.2 liter diesel engine, all with the highly-rated common rail technology.


Micra


Almera

Improvement of Drivetrain Efficiency

①Belt Type CVT (Continuously Variable Transmission)
(XTRONIC CVT / Nissan CVT / Nissan CVT-M6)

A belt type CVT that provides continuous changes of ratio using a pulley and a steel belt, and which was first used in the 1992 model March. In 1997, a torque converter was used in the development of the world's first 2.0 liter class "Nissan CVT," with improved initial acceleration. Furthermore, in 2002, we introduced world's first 3.5 liter FF vehicles adaptable XTRONIC CVT to the Teana. This achieved a combination of sporty handling only possible with manual mode transmission, smooth acceleration resulting from expanded gear ratio and lock-up ranges, and enhanced fuel economy.

②Troidal Type CVT (Continuously Variable Transmission)
(EXTROID CVT)

This is the world's first CVT that was commercialized to provide drive power and ratio changes by combining disk and power rollers (double cavity type). This transmission was first used in the Cedric and Gloria 1999 models. In 2002, it was fitted to the Skyline 350 GT-8, providing excellent response, smooth acceleration, and improved fuel economy for large displacement engines.

Vehicles with CVT

CVT	Models
Nissan CVT Nissan CVT-M6	Primera (photo), Primera Wagon, Avenir, Liberty, Wingroad, Serena, Bluebird Sylphy
XTRONIC CVT	Teana (photo), Cube
EXTROID CVT	Cedric (photo), Gloria, Skyline






Vehicles with CVT sold in FY 2002

TOPICS **New 4WD System "e·4WD"**

Nissan has developed "e·4WD," a light, compact, and totally new electronic four-wheel-drive system, which has been fitted to the March from September 2002, and to the Cube from October 2002. "e·4WD" is a system engineered around a regular front drive configuration, and uses an electric motor to drive the rear wheels only when 4WD capability is needed.

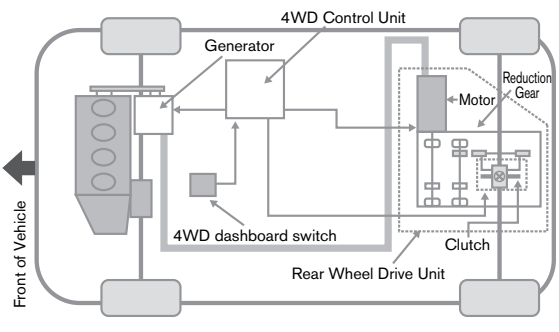
The low friction drive train means improved fuel efficiency when compared to former 4WD vehicles. In particular, when the driver selects 2WD, the clutch within the rear wheel drive unit is disengaged, meaning fuel efficiency close to that of 2WD vehicles (tests conducted by Nissan indicate a 5% improvement in fuel efficiency over ordinary 4WD).

The system comprises three elements; the "4WD control unit," that controls the power, a "rear wheel drive unit" consisting of a motor, clutch, and reduction gear, and a "dedicated generator," for supplying power to the drive motors. When 4WD operation is required, the 4WD control unit directs the dedicated generator to produce electricity, which powers the motors at the rear of the car, whereupon these motors drive the rear wheels via a clutch. Between the rear wheel motors and the wheels is situated an electromagnetic clutch, and by disengaging this clutch when 4WD is not required, friction is reduced, thus resulting in lower fuel consumption. In addition, the driver can select manually between 4WD and 2WD, meaning they can gain extra fuel efficiency on dry roads.


4WD Control Unit


March e·4WD


Cube e·4WD



4. Development of Clean Energy Vehicles

Nissan is acting aggressively to prevent global warming, to reduce and clean exhaust emissions, and to respond to future energy problems, by way of research and development in four technological areas: fuel cells, electricity, hybrid technologies and natural gas. Issues such as vehicle durability, price, driving range, technical issues and the establishment of fuel supply centers for use by these vehicles must all be addressed, in order to see increased usage of clean energy vehicles. Furthermore, in cooperation with other industries, we are continuing efforts in R&D and commercialization in response to requirements.

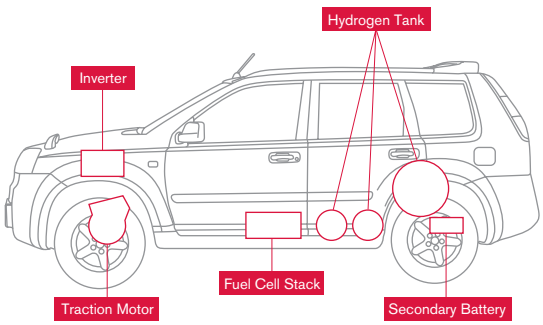
Fuel Cell Vehicle (FCV)

This is an automobile with a clean and efficient power source that directly generates electrical energy through the reaction of hydrogen and oxygen, leaving only pure water as a by-product. Nissan's FCV applies technologies that have been developed in Nissan, such as lithium ion batteries and high voltage electric systems for electric vehicles, control technologies for hybrid vehicles and high pressure gas storage systems for CNGV. Nissan has been developing FCVs that aims to achieve excellent environmental and energy-saving capability.

In December 2002, the X-TRAIL FCV obtained certification of the Ministry of Land, Infrastructure and Transportation, and started public road testing in Japan. With the participation of the Japan Hydrogen & Fuel Cell Demonstration Project (JHFC) and the California Fuel Cell Partnership (CaFCP) in the USA, Nissan has been acquiring data of public road test and continuing to improve public awareness of fuel cell vehicles.

Nissan intend to make further improvements to the X-TRAIL FCV, and limited sales are scheduled in 2003.

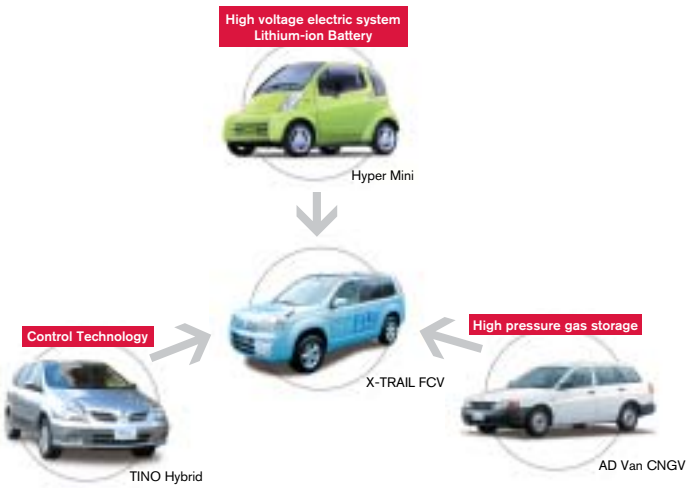
X-TRAIL FCV



X-TRAIL FCV Layout Overview

Features of Nissan's FCV Technology Development

Nissan's FCV applies EV (Electric Vehicle), HEV (Hybrid Vehicle) and CNGV (Compressed Natural Gas Vehicle) technologies which have been developed up to the present.



History of Nissan FCV Technical Development

1996 Start of Full-scale FCV Development

May 1999 Start of Full-scale FCV Driving Tests

Started of vehicle testing using R'nessa FCV, methanol reformate FCV.

March 2000 Participation in CaFCP

Participation in "California Fuel Cell Partnership".

April 2001 Start of public road testing in North America

Started the five-year program of FCV development in cooperation with Renault, with an investment of ¥85 billion. The start of public road testing of the XTERRA FCV, based in Sacramento, California.

XTERRA FCV (Hydrogen Fuel Cell Vehicle)

December 2002 Start of public road testing in Japan

X-TRAIL FCV, direct-hydrogen-fueled FCV, obtained certification of MLIT, and stared public road testing in Japan.

X-TRAIL FCV (Hydrogen Fuel Cell Vehicle)

2003 Limited Sales

Based upon the X-TRAIL FCV, we will make further improvements, and will start leasing of FCVs in 2003, 2 years ahead of initial planning.

Electric Vehicle (EV)

From February 2000, we commercially introduced the ultra small electric vehicle “Hypermini” as a proposal for a new type of city vehicle. Hypermini uses aluminum platform exclusively developed for the vehicle, while also supporting its high energy efficiency and ease of use, plus its safety as an ultra small vehicle. Also, a market survey for ultra small electric vehicle commenced from November 2001 jointly with University of the California, Davis, using the Hypermini.

Hybrid Electric Vehicle (HEV)

We have developed the “Nissan Hybrid”, a hybrid system that dramatically improves fuel efficiency by combining an electric motor with a gasoline powered engine and utilizing both of their strong features. The vehicle was commercially released in April 2000 under the name of “Tino Hybrid”. We also have put effort into development of fuel efficiency technologies including hybrid technology, such as organizing the specialized department.
Also, Nissan and Toyota Motor Corporation have concluded a basic agreement on the long-term, continuous transaction of the hybrid systems including technical cooperation aiming for further decreasing the cost of hybrid vehicle components, which should lead to boosting the sales of hybrid vehicles around the world. As an initial project, Nissan will be installing a hybrid system currently under development by Toyota Motor Corporation in Nissan’s vehicle to be sold in the United States in 2006.

Natural Gas Vehicle (NGV)

Nissan is involved in the research and development of high-performance compressed natural gas vehicles (CNGV) that in the most part use methane, which has environmentally friendly qualities such as low NOx and CO_2 emissions, as well as the being an alternative energy source that does not depend on petroleum. The new AD Van CNGV launched in January 2000 was the first vehicle certified as a low emission vehicle by the Ministry of Land, Infrastructure and Transport’s low-emission vehicle certification system. This vehicle has power, performance, and comfort levels similar to that of standard gasoline vehicles, and an cruising range that is at the top of its class. These features meant that, in July 2002, cumulative sales of the AD Van CNGV in Japan achieved a thousand units, and succeeded in taking the top share of the small van CNG vehicle market.
Furthermore, the "Civilian CNG" was released in January 2003 taking into account the environment in the microbus market. It is based around the TB45E gasoline engine, and while achieving power output comparable to a diesel turbo engine, its low noise and vibration emissions make it very environmentally friendly.

AD Van CNGV

Civilian CNG

We are introducing the "AD van CNGV," the "Atlas CNGV," the "Caravan CNGV," and the "Civilian CNG," to ensure a full lineup of natural gas powered passenger and commercial vehicles, and are striving to promote the spread of low-emissions vehicles.

LPG Vehicle

LPG is widely used as an alternative to diesel fuel in commercial vehicles, as it combines low emission levels with quiet operation. In 1998, Nissan released the low emission Cedric/ Gloria LPG and Crew LPG vehicles. These were designated as low emission vehicles in seven prefectures and cities, and as low NOx vehicles in six prefectures and cities in the Kyoto, Osaka and Kobe region. In 2002, all of our commercial LPG vehicles gained accreditation as "Excellent-Low Emission Vehicles (E-LEV)" under the Ministry of Land, Infrastructure and Transport's accreditation system for vehicles with low emissions gas, and these were the first domestic commercial LPG powered vehicles to do so. LPG delivery trucks are in high demand, and Nissan provides a full range of 1.5- to 3.0-ton Atlas LPG trucks.

Crew LPGV

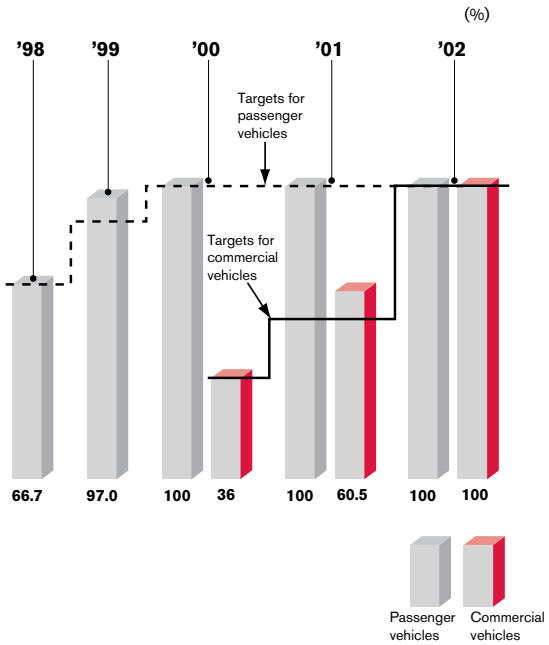
5. Reduction of Vehicle Noise

Vehicles emit various types of noise, including engine noise, tire noise, exhaust noise, intake noise, cooling fan noise, and wind noise. We have conducted aggressive research and development in this area aimed at reducing noise levels, and have achieved favorable results.

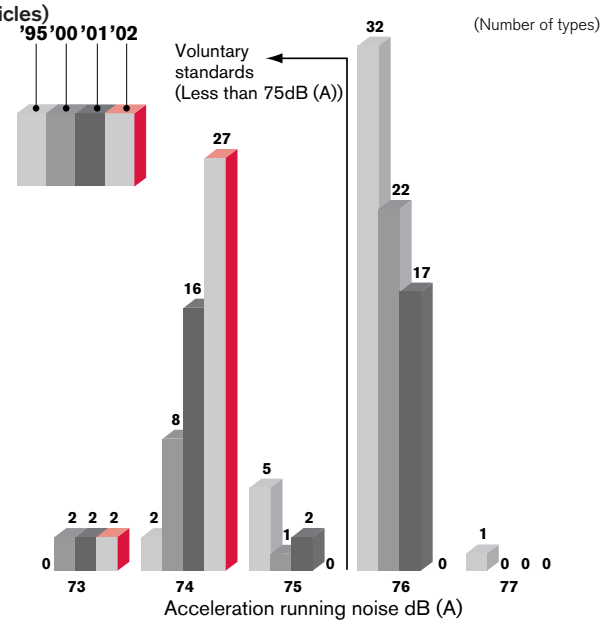
By 1996, our vehicles complied with new European standards, and all of Nissan's vehicles including commercial vehicles achieved new Japanese standards by 2002.

In the future, we will continue to work towards compliance with voluntary standards in Japan, Europe, North America, and in other regions.

Qualification Ratio of the New Standards (Japan) for External Noise



Transition of Acceleration Running Noise (Japan) (Commercial Vehicles)



6. Control of Air-Conditioner Refrigerant Emissions

Chlorofluorocarbon 12 (CFC12) was used in the past as a refrigerant for vehicle air conditioners, but as this was found to destroy the ozone layer, the "CFC Countermeasures Committee" established in February 1989 quickly banned its use. Subsequently, we began replacing CFC with a new refrigerant (HFC134a). In recognition of this undertaking, our company received the U.S. Environmental Protection Agency's Montreal Protocol 10th Anniversary "Best of the Best Stratospheric Ozone Protection Award" in September 1997.

Emission Restraints of HFC134a at the Development Stage

The use of CFC12 was totally abolished by the end of 1994, after full implementation of the substitute refrigerant HFC134a in all production vehicles. However, we are currently conducting research to conserve the use of refrigerants, and to develop refrigerants with a lessened environmental impact, because HFC134a is also said to contribute to global warming.

Conserving Refrigerants

We have reduced the amount of HFC134a used, and are gradually introducing equipment designed to reduce air conditioner leakage on new model vehicles. As of the end of FY 2002, 22 models now use air conditioners that have been modified in this way.

Researching Vehicle Air Conditioner Refrigerants with Low Environmental Impact

In cooperation with vehicle air conditioner manufacturers, we are conducting research into systems that use CO_2 or HC type refrigerants, but as of present, certain problems mean that none of these have been commercialized.

7. LCA (Life Cycle Assessment)

Nissan embarked on LCA at the start of the 1990s, by carrying out environmental impact assessments on car bodies and parts such as radiators, and on air conditioner refrigerants. Recently, we are working to further reduce environmental impacts over the products' lifecycle by applying LCA to the Skyline front end module and to the Stagea back door. LCA is a logical and effective method to enable the general assessment of environmental impacts. In the future, we will continue to work towards its reduction, and are investigating putting LCA to use in our business activities and product planning.

Skyline front end module