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February 2009

# Nissan's Environmental Initiatives

Nissan Green Program



**NISSAN**

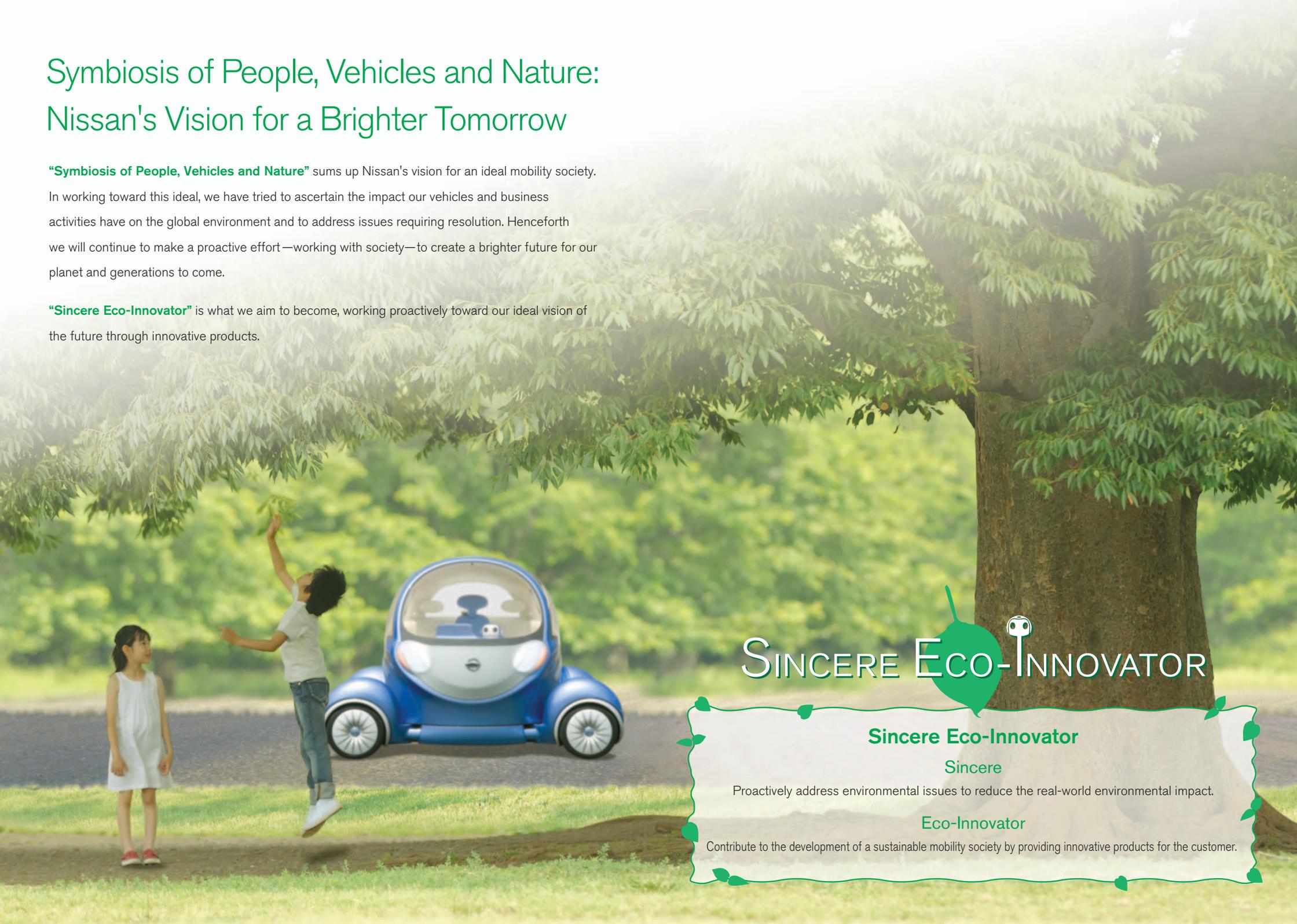


# Symbiosis of People, Vehicles and Nature: Nissan's Vision for a Brighter Tomorrow

“**Symbiosis of People, Vehicles and Nature**” sums up Nissan's vision for an ideal mobility society.

In working toward this ideal, we have tried to ascertain the impact our vehicles and business activities have on the global environment and to address issues requiring resolution. Henceforth we will continue to make a proactive effort—working with society—to create a brighter future for our planet and generations to come.

“**Sincere Eco-Innovator**” is what we aim to become, working proactively toward our ideal vision of the future through innovative products.



SINCERE **ECO-INNOVATOR**

**Sincere Eco-Innovator**

**Sincere**

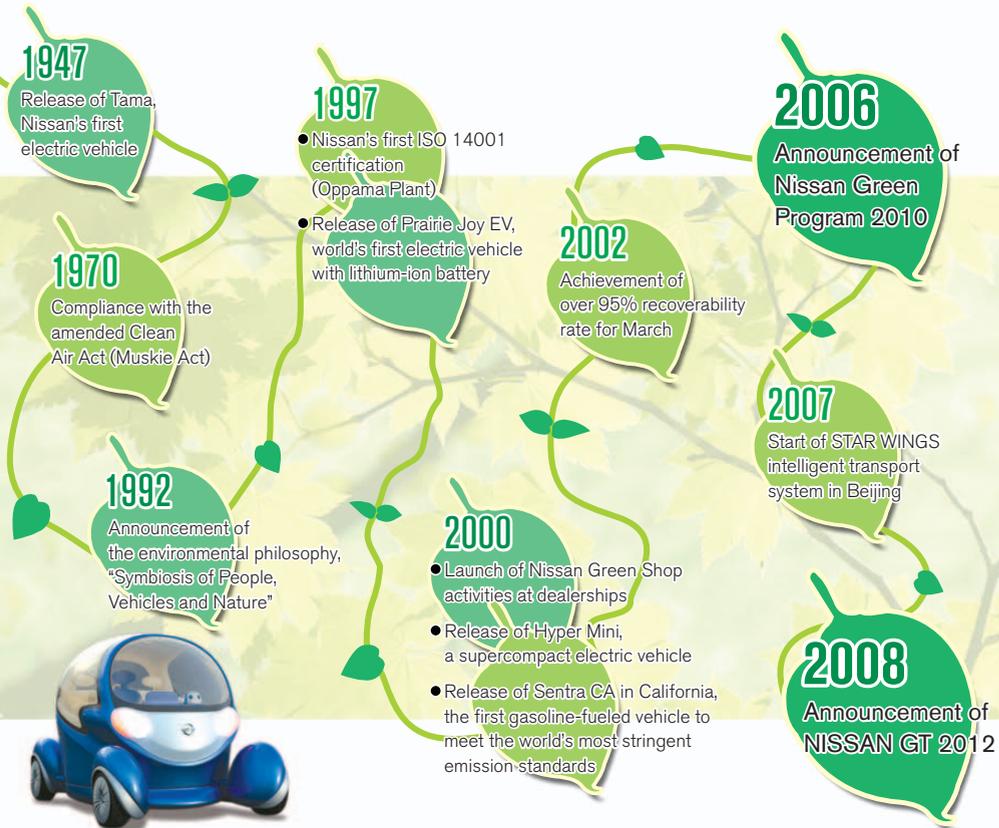
Proactively address environmental issues to reduce the real-world environmental impact.

**Eco-Innovator**

Contribute to the development of a sustainable mobility society by providing innovative products for the customer.

# Toward Our Ultimate Goal as an "Eco First" Company

The history of Nissan's environmental initiatives goes back to 1947. These activities were accelerated throughout the company after 1992, when Nissan announced its environmental philosophy, a "Symbiosis of People, Vehicles and Nature." Today, based on our midterm environmental action plan, Nissan Green Program 2010, we have identified three key issues and established ultimate goals for each of these areas and are advancing our efforts to achieve these goals. Our five-year business plan called NISSAN GT 2012 includes a commitment for Nissan to become a "leader in zero-emission vehicles" and seeks the development and spread of electric vehicles.



ECO  
FIRST

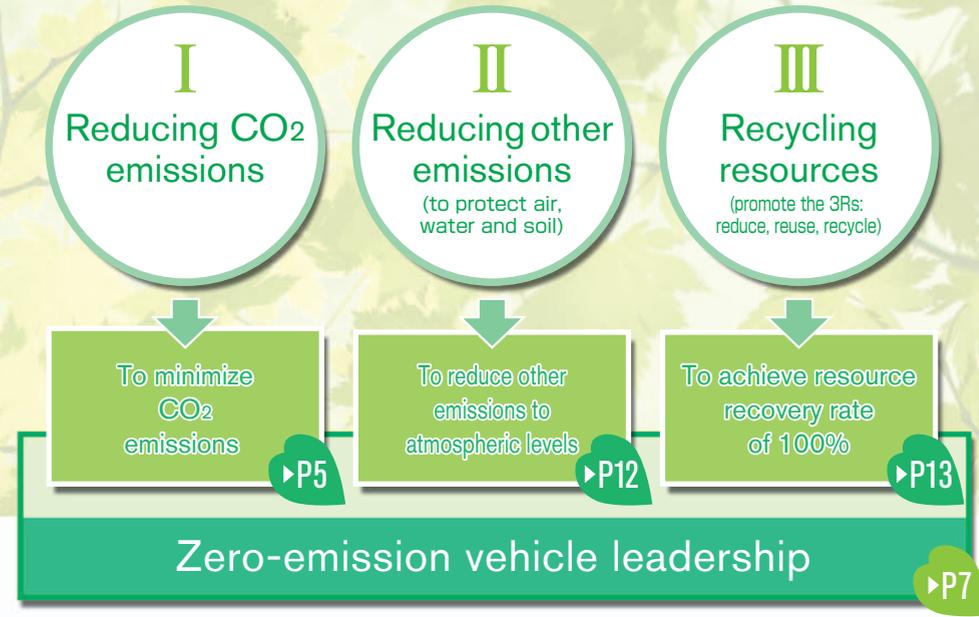
### Eco First Company

Under the Eco First Program established by Japan's Ministry of the Environment in 2008, Nissan was recognized as an Eco First company for its industry-leading environmental commitments and innovations.

Nissan's Environmental Philosophy  
**Symbiosis of People, Vehicles and Nature**

**Ultimate Goal**  
To keep the environmental impact caused by our operations and by the usage of Nissan vehicles within the Earth's natural ability to absorb such impact.

Midterm environmental action plan  
**Nissan Green Program 2010**  
**Three Key Issues**



NISSAN  
GREEN PROGRAM

### Nissan Green Program 2010

Announced in December 2006, Nissan Green Program 2010 is a mid-term environmental action plan representing a step forward from Nissan Green Program 2005. It identifies what we need to achieve by 2010 in order to reach our ultimate environmental goals.

# Reducing CO<sub>2</sub> Emissions

## One of the Most Important Issues Facing Automakers Today

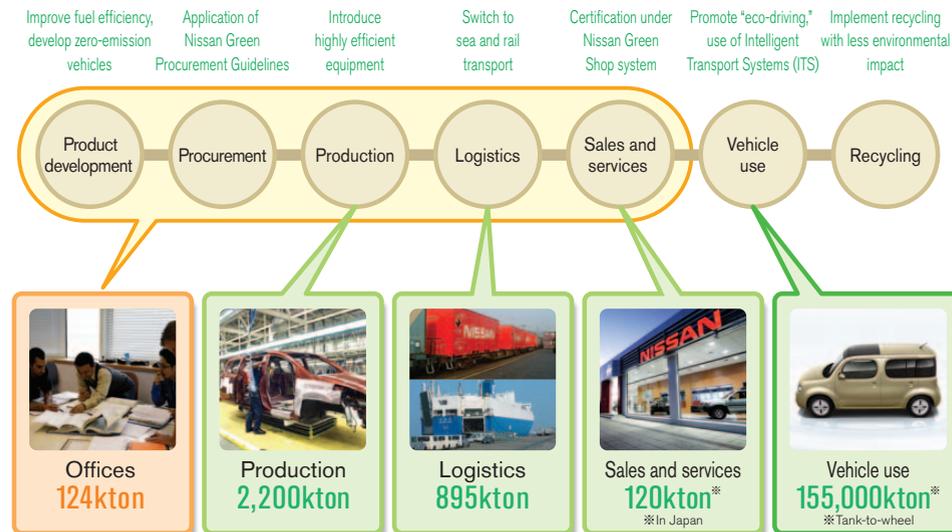
Changes in the environment have been projected as a result of rising atmospheric temperatures. The reduction of CO<sub>2</sub> emissions—considered by many scientists to be a major factor behind global warming—is thus a challenge that humanity must meet on a global scale. At Nissan we take a variety of steps to reduce the emission of CO<sub>2</sub> at all stages of our operations, as well as during the life cycle of Nissan vehicles—from production and delivery to customer use.

### Nissan's Efforts to Reduce CO<sub>2</sub> Emissions

In a vehicle's life cycle, the greatest amount of CO<sub>2</sub> is emitted as a result of burning fuel when driving. Nissan thus gives high priority to reducing CO<sub>2</sub> emissions during vehicle use.

#### Nissan's CO<sub>2</sub> Emission Levels

(per year, according to Nissan's calculations)



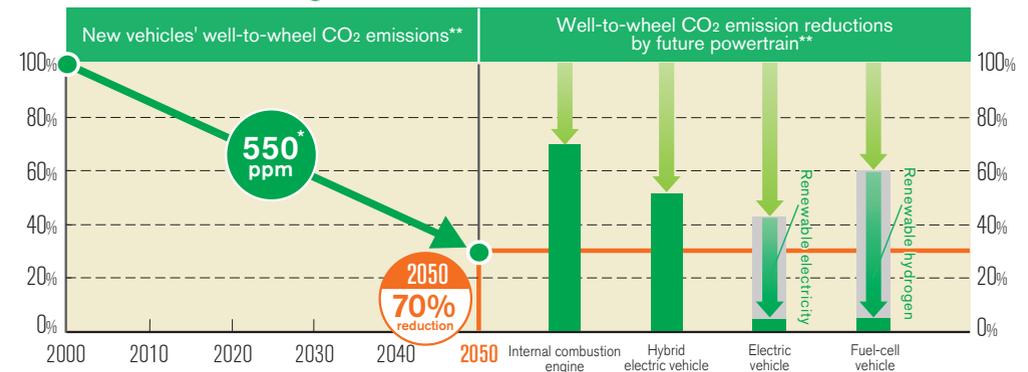
### Reducing CO<sub>2</sub> Emissions During Vehicle Use

Nissan has established a long-term goal of reducing CO<sub>2</sub> emissions from new vehicles by approximately 70% from 2000 levels by 2050 and is integrating a variety of approaches to achieve this target. In addition to substantially improving the fuel efficiency of our gasoline vehicles, Nissan is introducing and promoting the spread of electric vehicles and developing fuel-cell vehicles as zero-emission vehicles of the future. We are also developing technologies and undertaking activities to promote "eco-driving" habits to reduce CO<sub>2</sub> emissions during vehicle use. And we are collaborating with regional and national governments and other industries to improve the traffic environment.

#### Efforts to Reduce CO<sub>2</sub> Emissions During Vehicle Use



### Long-Term CO<sub>2</sub> Reduction Goals



\* In line with the IPCC's Third Assessment Report, if average temperatures are to be prevented from rising more than 2 degrees Celsius, atmospheric CO<sub>2</sub> will need to be stabilized at 550 parts per million.

\*\* Well-to-wheel emissions are the total CO<sub>2</sub> emissions from oil extraction through consumption as fuel when the vehicle is driven.

## Zero-Emission Vehicle Leadership

Popularizing Electric-Powered Vehicles

### Electric Vehicles (EVs)

Electric vehicles run on motors and batteries and do not emit CO<sub>2</sub> or other exhaust gases during driving. Nissan will introduce an all-electric vehicle in the United States and Japan in fiscal 2010 and then mass-market EVs to consumers globally in fiscal 2012. We aim to become a leader in zero-emission vehicles and will work closely with governments, other industries and various stakeholders to clear a path toward the mobility society of the future.



The Nuvo concept electric vehicle announced at the Paris Motor Show 2008.

### Fuel-Cell Vehicles (FCVs)

Fuel-cell vehicles (FCVs) use electricity generated from hydrogen and oxygen as their power source. FCVs do not give off CO<sub>2</sub> or other exhaust gases, and emit only water during driving. Nissan has been marketing FCVs for lease on a limited basis since fiscal 2003. We are further enhancing practicality and reducing costs and plan to release new FCVs in the early 2010s.



Nissan's FCV, the X-Trail FCV.

### Battery Development

A core technology in electric and fuel-cell vehicles is the battery. Nissan has been marketing vehicles with lithium-ion batteries since the 1990s and has continued to make improvements while undertaking market assessments. Building on this experience, Nissan established Automotive Energy Supply Corp. (AESC) as a joint-venture company with NEC Corp. and NEC Tokin Corp. in 2007 to develop, manufacture and market these batteries. AESC aims to begin supplying lithium-ion batteries for use in Nissan and other EVs in fiscal 2009.



A lithium-ion battery module for EVs that features a twofold increase in energy density and 1.5-fold rise in power output over conventional battery packs.

### Renault-Nissan Alliance to Promote Global Mobility Innovation through EVs

The Renault-Nissan Alliance has established partnership agreements with the governments of Israel, Portugal, Yokohama (Japan), Tennessee and Oregon (U.S.) aimed at providing a conducive environment for the adoption and usage of EVs, thus promoting a feasible and realistic solution to the need to reduce CO<sub>2</sub> emissions, easing dependence on fossil fuels and addressing urban mobility issues. We will work with our partners to popularize EVs in markets around the world.

#### Partnerships with Governments around the World



### NISSAN GT 2012



NISSAN GT 2012 is a five-year business plan launched in fiscal 2008 focused on fostering "growth" and "trust" from a longer-term perspective. It commits Nissan to becoming a "leader in zero-emission vehicles" in efforts to achieve a sustainable mobility society.

## Pursuit of Broad Range of Solutions

Innovations in Engines and Transmissions

### Better Fuel Efficiency for Gasoline Vehicles

To reduce our global CO<sub>2</sub> emissions, we believe it is important to not only promote the spread of zero-emission vehicles like electric vehicles but also significantly improve the fuel efficiency of the internal-combustion engines used in most cars today. Nissan is developing technologies to reduce CO<sub>2</sub> emissions from gasoline engines to the level of diesel engines and hybrid systems.



The Nissan Note and several other models have achieved top fuel-efficiency levels.

### Hybrid Electric Vehicles (HEVs)

Hybrid electric vehicles (HEVs) combine an engine and an electric motor and emit substantially less CO<sub>2</sub> than a standard internal-combustion engine vehicle. Nissan launched the Altima Hybrid in North America in 2007. In fiscal 2010, it aims to launch new HEVs with Nissan's original hybrid technologies in North America and Japan.



A prototype of a rear-wheel-drive HEV that will be launched in North America and Japan in fiscal 2010.

### Developing Biofuel Vehicles

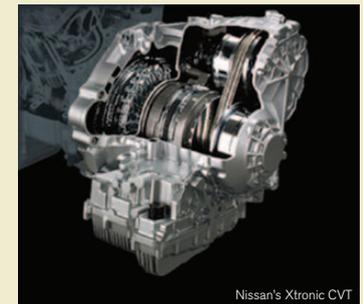
Biofuels, which are made mainly from plant matter, are renewable energy sources that can help reduce CO<sub>2</sub> emissions. All new gasoline-fueled vehicles released by Nissan are designed to be able to run on gasoline with a 10% blend of bioethanol (E10), and in North America, Nissan markets the Titan FFV and Armada FFV, which can run on 85% bioethanol fuel (E85).



The Nissan Murano was the first car in Japan certified by the minister of land, infrastructure, transport and tourism as compatible with E10 fuel.

### One in Four Nissan Vehicles Sold Globally in 2007 Carried CVTs

Since the March became the first Nissan vehicle to be fitted with a continuously variable transmission (CVT)\* in 1992, we have been making an active effort to broaden the use of CVTs out of the belief that fuller and immediate utilization of available technologies would be effective in reducing total CO<sub>2</sub> emissions. As a result, global sales of CVT vehicles reached 1,088,000 units in fiscal 2007. Approximately 28.6% of all Nissan cars sold worldwide were CVT vehicles, compared to just 7% in fiscal 2004, and in North America and Japan, CVT vehicle sales accounted for 47.4% and 43.8%, respectively, of the total.



Nissan's Xtronic CVT

\*A CVT is a transmission that can change steplessly through a near-infinite number of gear ratios, which we believe contributes to lower CO<sub>2</sub> emissions and better fuel efficiency than conventional transmissions.

# Key Issue I Reducing CO<sub>2</sub> Emissions

## Working with Customers and Society Building a Low-Carbon Society with ITS Technology

Nissan is working to reduce CO<sub>2</sub> emissions in a variety of ways, such as by promoting fuel-efficient driving habits by installing "eco meters" in the instrument panel and providing drivers with real-time traffic information, as well as by developing Intelligent Transport System (ITS) technologies to reduce congestion and improve the traffic environment.

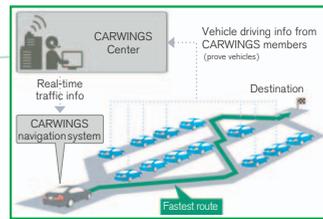
### Car Navigation System to Promote Eco-Driving Habits

#### Fastest-Route Guidance System

In Japan, Nissan provides guidance on the fastest route to one's destination by combining data collected from probe vehicles equipped with the CARWINGS\* route-suggestion system and both real-time and pre-installed traffic information.

This helps improve average travelling speed and thereby supports eco-driving.

\* CARWINGS is Nissan's information service for car navigation systems, including some third-party systems.



#### Eco-Driving Support Services

Nissan provides a variety of services that makes eco-driving fun and sustainable. Based on vehicle information from onboard navigation equipment forwarded to the CARWINGS Center, average fuel consumption is calculated and monthly rankings are made of same-vehicle owners in Japan according to their fuel efficiency.



### STAR WINGS Helps Reduce Congestion in Beijing

We are working on the STAR WINGS project in Beijing, China, in collaboration with the Beijing Transportation Information Center to relieve congestion. It is aimed at improving traffic flow\* by providing real-time information on traffic congestion and guidance on the fastest route to the destination. The new Nissan Teana that went on sale in June 2008 is the first commercially marketed vehicle in China to feature a smart route-guidance navigation system.

\* Overall traffic flow can become smoother by redirecting a certain number of vehicles to the fastest route.

# STAR WINGS

SINCERE  
ECO-INNOVATOR

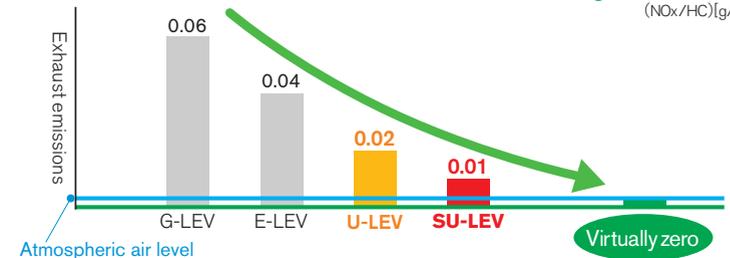
# Key Issue II Reducing Other Emissions

## Striving to Achieve Cleaner Emissions

Since early on, Nissan has been developing and promoting technologies that achieve cleaner emissions. As a result, as of January 2008 over 85% of all new Nissan vehicles sold in Japan were certified as Super Ultra-Low Emission Vehicles (SU-LEVs)\*. We will continue to make improvements with the ultimate goal of achieving emissions as clean as the atmosphere.

\*SU-LEV: Super Ultra-Low Emission Vehicle (Japanese emission standard)  
SU-LEVs produce 75% less nitrogen oxide (NOx) and non-methane hydrocarbon (NMHC) emissions than prescribed by 2005 standards.

### Exhaust Emissions Reductions and Future Target for LEVs (NOx/HC)[g/km]



### Low-Pollution Products and Technologies

#### Introducing Clean-Diesel Vehicles

Nissan has been devoting its energies to developing clean diesel engines that can clear future emission standards,\* and we will expand sales of such vehicles in Japan, North America, and China. In September 2008 we released the new X-Trail 20GT with a clean diesel engine that complies with Japanese exhaust emission regulations, which are among the most stringent in the world.



\* Including Japan's Post New Long-Term Emission Regulations, the Tier 2 Bin 5 regulation of the United States, and Europe's Euro5.

#### New Catalyst Halves Use of Precious Metals

Precious metals are used in catalysts to clean exhaust emissions. By using nanotechnology, Nissan has developed a catalyst for gasoline vehicles that uses only half the precious metals of conventional catalysts. The new catalyst is featured in the Cube that was released in Japan in November 2008. Reducing the use of precious metals not only contributes to balancing emissions and costs but also helps address the problem of resource depletion. We will continue to actively promote R&D activities in this area.

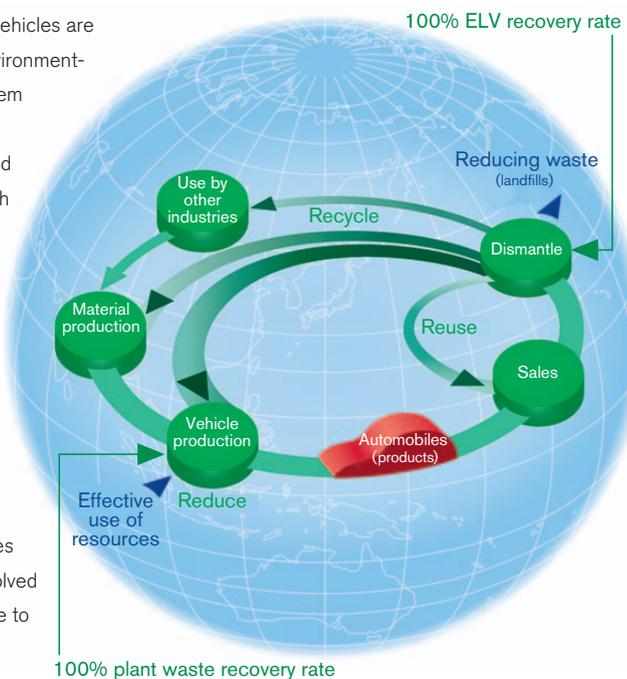
## Nothing Wasted: Aiming for a Recovery Rate of 100%

Nissan is an automaker with operations all around the world. Our basic stance is to treat resources as precious materials to be used as efficiently as possible and to reduce the burden on the environment. Our basic approach is to promote the "three Rs":

① **reduce** the use of substances that will end up as waste, ② **reuse** what we can and ③ **recycle** materials whenever possible. At every stage of a vehicle's life cycle, we seek to make effective use of precious, limited resources, thereby contributing to the sustainability of the resource cycle.

### Nissan's Ultimate Goal: 100% Recovery Rate

- At the development stage, Nissan vehicles are designed to reduce their use of environment-impacting substances and make them easier to recycle.
- Nissan's goal is to reduce, reuse and recycle the waste generated at each stage of the production phase as much as possible.
- The reuse and Remanufacturing of parts will be promoted at the sales and service phases of a vehicle's life cycle.
- We research ways to make dismantling and recycling easier at the end of a vehicle's life, and we share the knowledge and techniques gained in this work with people involved in the earlier phases of the life cycle to improve the total process.



### Globally Promoting Designs that Consider the Life Cycle of the Vehicle

All new Nissan models released in Japan and Europe since 2005 claim a recoverability rate\* of 95%, and voluntary recycling activities are being advanced in other markets.

\* Recoverability rate:  
Calculated based on 1998 Japan Automobile Manufacturers Association definition and calculation guidelines (in Japan) and ISO 22628 (in Europe).



### Achieving a 95% Recovery Rate in 2006

In Japan, the Automobile Recycling Law has set an equivalent of 95% end-of-life-vehicle (ELV) recovery rate as the target to be achieved by 2015. Nissan achieved this goal well ahead of schedule in fiscal 2006 through the activities of the Nissan Green Program 2010. Our next aim is to reach the 95% target for Nissan vehicles on a global basis.



### Nissan Green Shop Certification System



All Nissan dealerships in Japan undertake a range of activities based on the Nissan Green Shop environmental management system, which is in line with ISO 14001 standards. Dealers certified as Nissan Green Shops maintain compliance with environmental regulations, manage all environment-related equipment, and ensure that ELVs and various forms of waste are treated of properly. Consideration is being given to expanding these activities on a worldwide basis in the future.