

2008 Advanced Technology Briefing

Nissan Motor Co., Ltd.

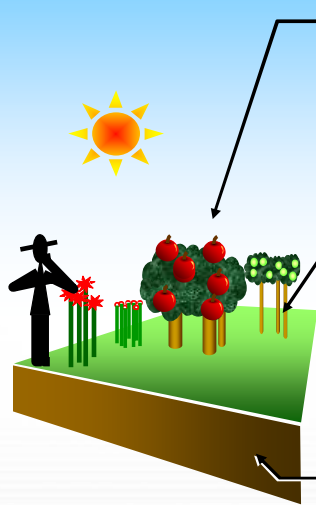
1

Agenda

- 1. Orchard Concept**
- 2. Safety Shield Technologies**
- 3. Environmental Technologies**
- 4. Application of Intellectual Assets**

2

Orchard Concept



I. Harvest Plan

- Performance & functions which exceed customer expectations
- Timing of release

II. Seeding & Growth

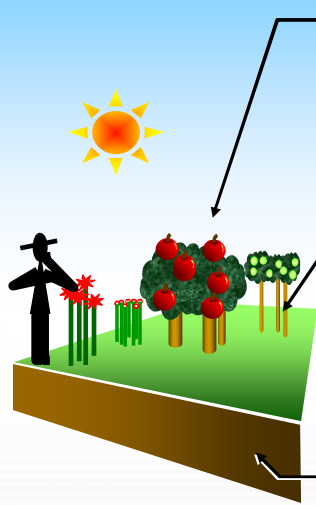
- To specify technologies to be developed for Harvest
- To formulate development schemes
Organizational Structure, Partnership,
Continuous improvements after introduction

III. Soil Enrichment

- To cultivate continuously R&D competencies for Harvest Plan and Seeding & Growth
- To promote foundational research for future Harvest Plans

3

Orchard Concept: Purpose of Advanced Technology Briefing



I. Harvest Plan

- To introduce technologies for commercial distribution within the next 2-3 years
- Timing of release

II. Seeding & Growth

- To specify technologies to be developed for Harvest
- To introduce fundamental technologies which support product commercialization, and the realization of Nissan's mid & long term vision

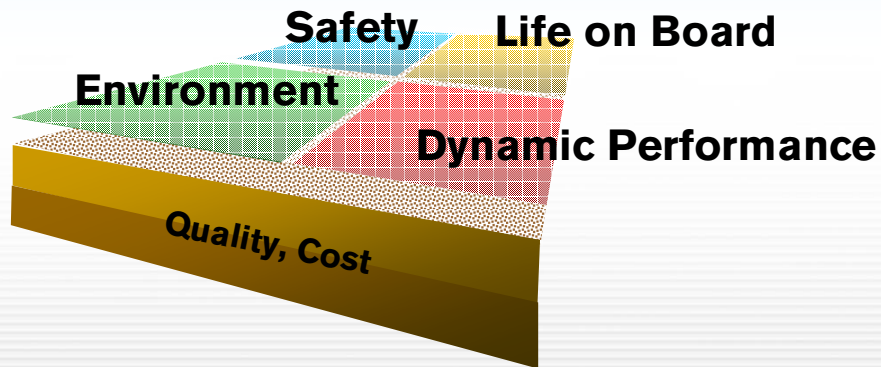
III. Soil Enrichment

- To cultivate continuously R&D competencies for Harvest Plan and Seeding & Growth
- To promote foundational research for future Harvest Plans

4

Nissan's Four Strategic Technology Fields

For each field, technology development will be based on a defined target (Vision 2015) and detailed roadmap

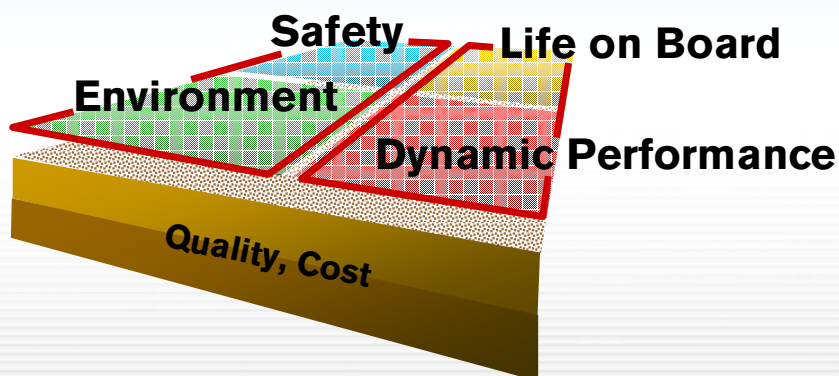


5

Nissan's Four Strategic Technology Fields

Nissan's Core Technology Values:

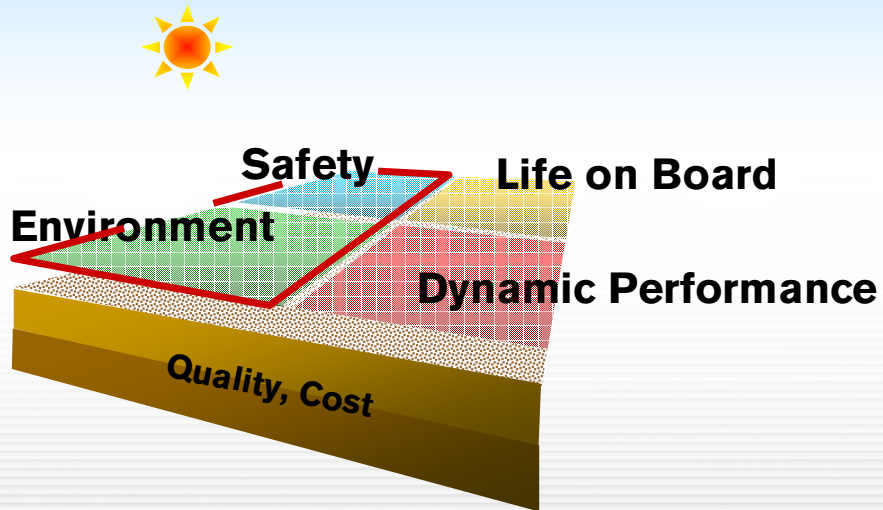
Trusted Driving Pleasure



6

Featured Technologies

- Today's focus will be on Nissan's advanced **Safety** and **Environmental** technologies



7

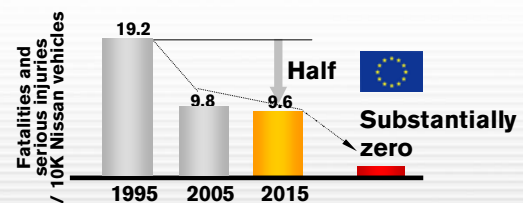
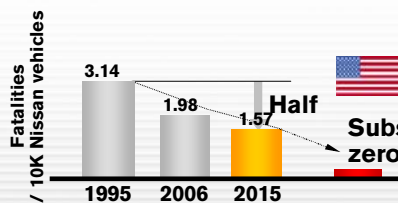
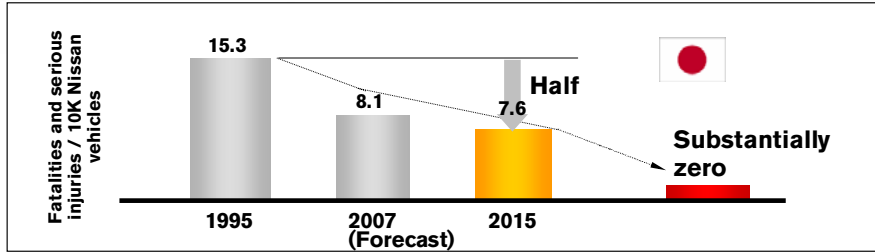
2. Safety Shield Technologies

8

Nissan's Safety Vision (Vision2015)

Reduce fatalities and serious injuries involving Nissan vehicles:

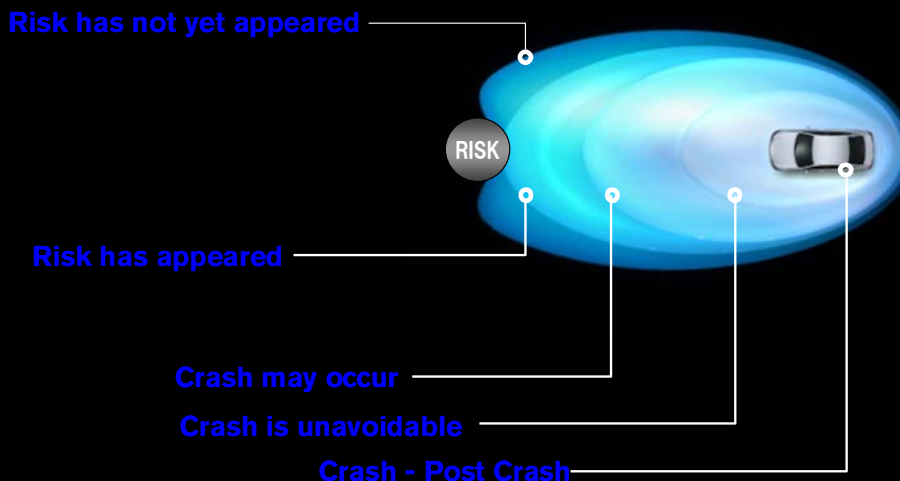
- Reduce by half by 2015 compared with 1995
- Ultimate goal: Substantially zero



Safety Technology Concept

“Safety Shield” ~A Vehicle That Helps Protect People~

The vehicles activates multiple barriers to help protect people from potential risks coming from every direction.



Safety Technology Concept

(Technologies being presented today)

“Safety Shield” ~A Vehicle That Helps Protect People~

The vehicle activates multiple barriers to help protect people from potential risks coming from every direction.

Risk has not yet appeared

- Smart Auto Headlight
- GPS Mobile ITS for Pedestrian Safety
- Around View Monitor with Parking Guide

Risk has appeared

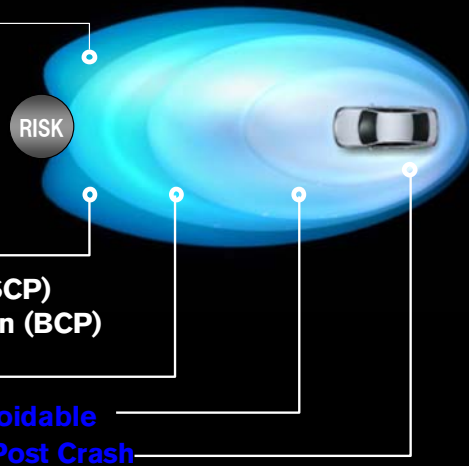
- Side Collision Prevention (SCP)
- Back-up Collision Prevention (BCP)

Crash may occur

Crash is unavoidable

Crash - Post Crash

- Intelligent Seatbelt
- Items to Promote Rear Seatbelt Fastening

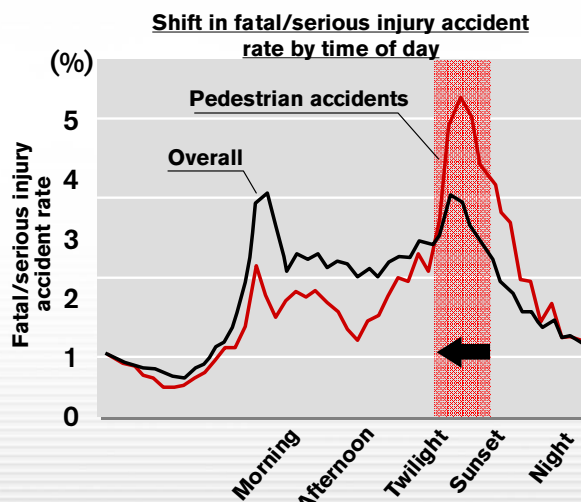


12

Smart Auto Headlight



- To be available on a new Model in fiscal 2010
- Light-ON timing extended to twilight and rainy weather to help improve visibility for both the driver and other road users
- Less intrusive lighting logic adapted after extensive case studies



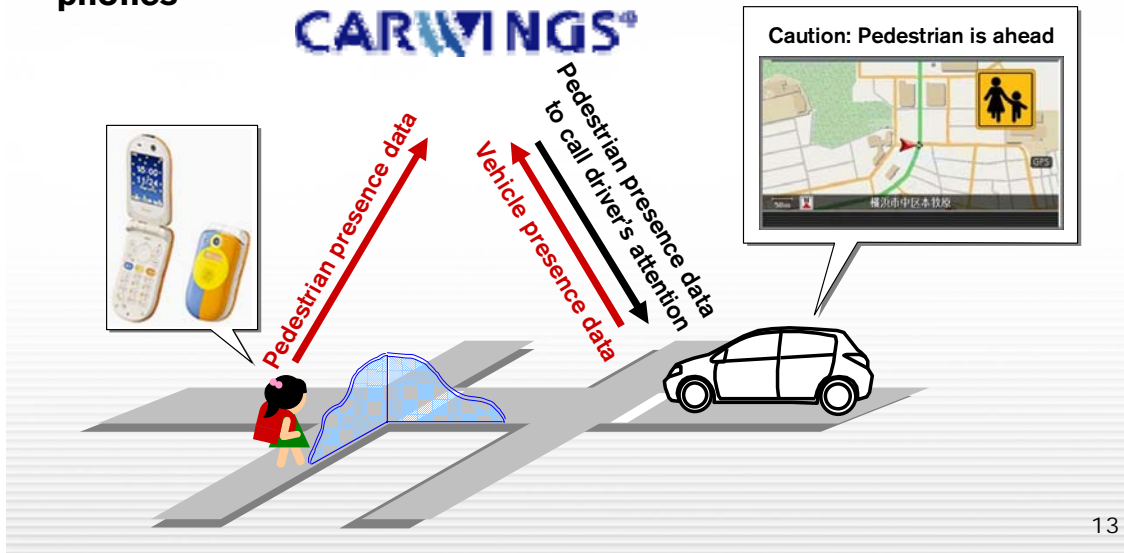
Source: Institute for Traffic Accident Research and Data Analysis

12



GPS Mobile ITS for Pedestrian Safety

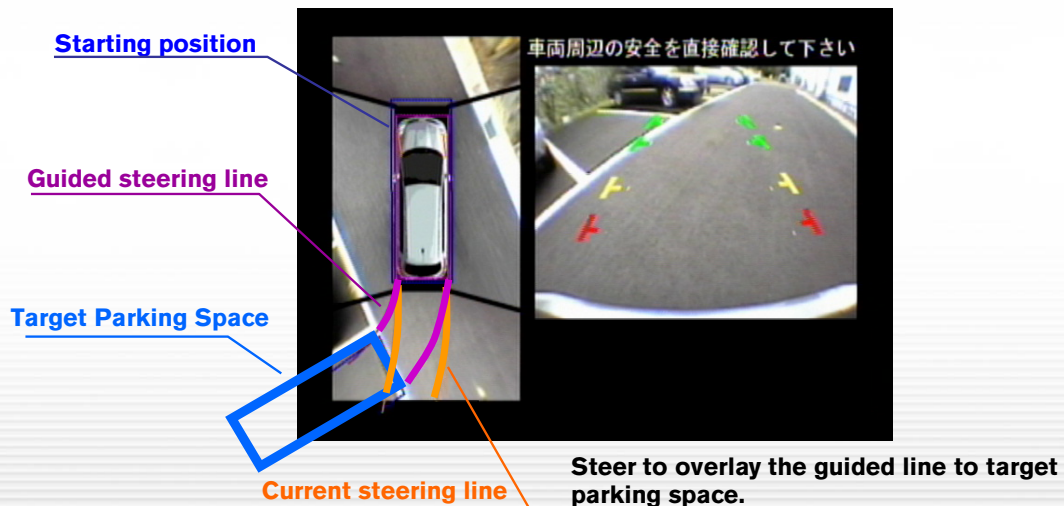
- Large scale field operational tests to start in fall 2008
- Helps reduce accidents involving pedestrians in blind spots by vehicle-pedestrian communication using GPS mobile phones



Around View Monitor with Parking Guide

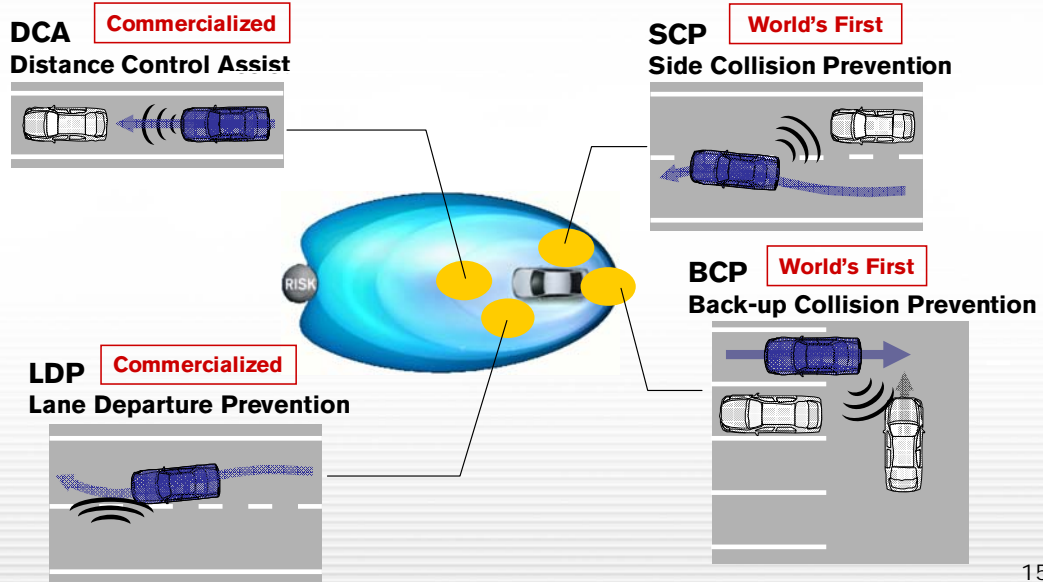
- 'Easy-to-use, easy-to-see, easy-to-understand' concept enhanced with the newly added parking guide function

Image of display (example)



All-Around Collision Free Prototype

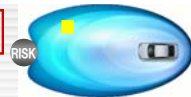
- Supports intuitive operation to help the driver avoid the potential risk in addition to visual display and audio alert



All-Around Collision Free Prototype

Test Drive Item

Side Collision Prevention (SCP)

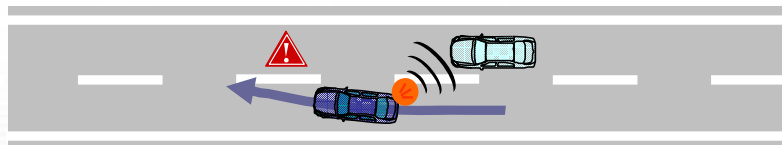


- Warns and assists the driver to help prevent a potential collision when a car approaches during lane change

1. Side sensors constantly measure the distance and relative speed between the vehicle and vehicles in the adjacent lane



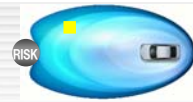
2. Warns the driver with both audio and visual alerts



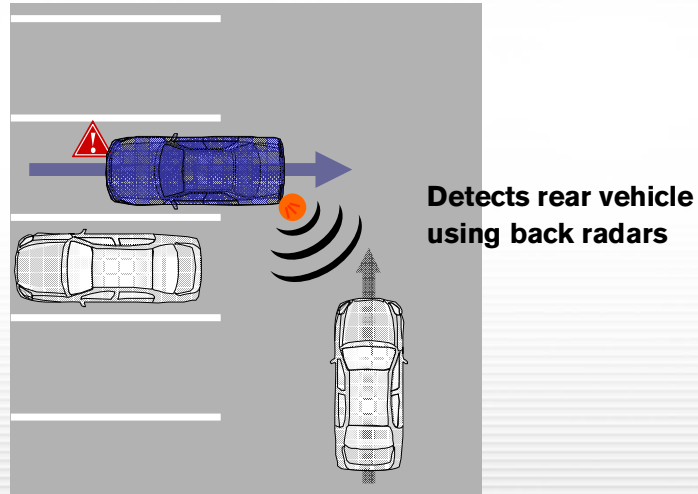
3. Generates yaw moment to help avoid potential collisions



All-Around Collision Free Prototype **Back-up Collision Prevention (BCP)**



- Activates an alarm and brakes to help avoid a collision when backing up
- Demo-vehicle to be shown at the ITS World Congress 2008 (New York)



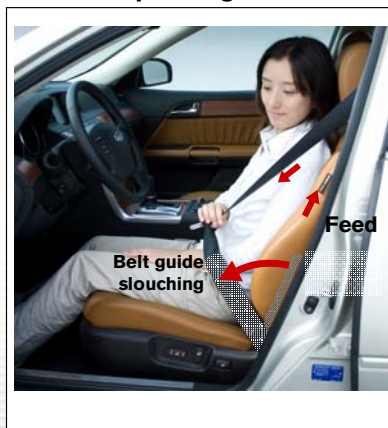
17

Intelligent Seatbelt

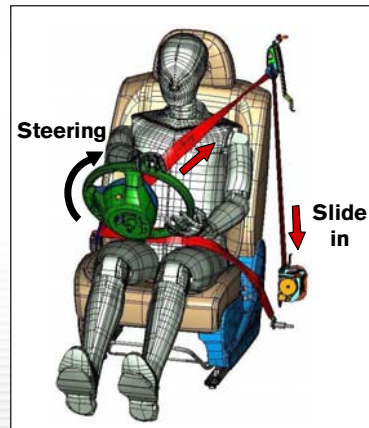


- The motor-powered seatbelt function,
 - enhances usability and comfort
 - helps improve restraint at abrupt maneuvers or skid situation

Belt extension when passenger sits

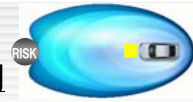


Belt control in abrupt maneuver



18

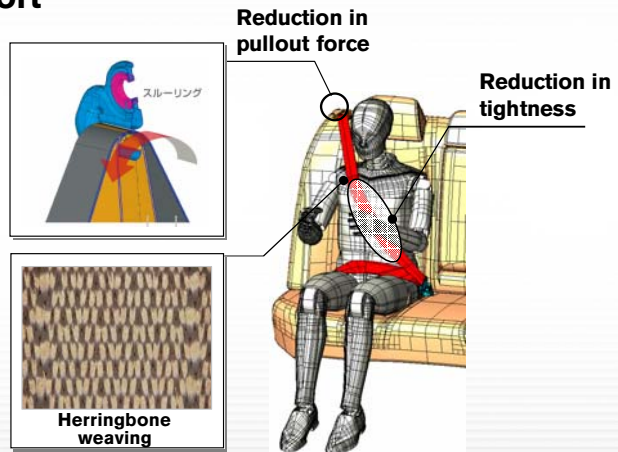
Items to Promote Rear Seatbelt Fastening



- Introduced in the new TEANA
- Self-standing Buckles and Low-friction Seatbelts package feature for enhanced comfort



Self-Standing Buckles



**Low Friction Seatbelts
(with a new weaving method)**

19

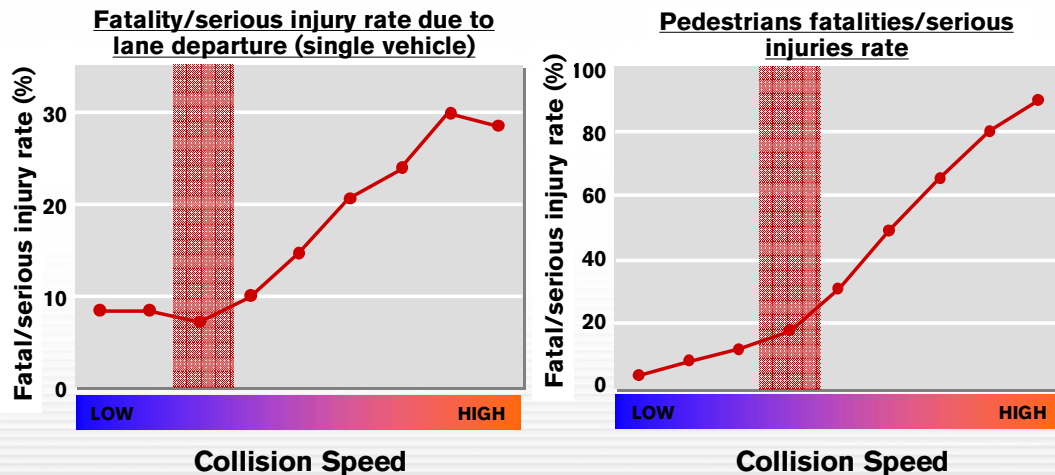
Approach towards substantially zero fatal and serious injuries



20

Fatal/Serious Injury Rate and Collision Speed

- An inflection point exists between the rate of fatal/serious injury and vehicle speed

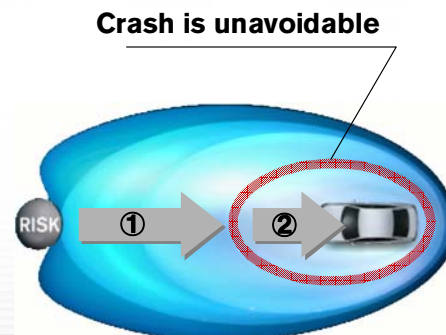
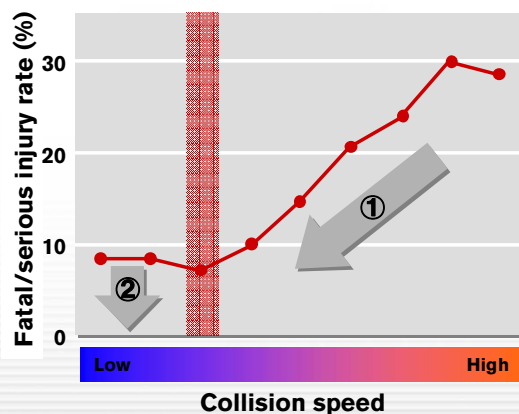


Source: Based on Nissan internal research data

21

Approach towards substantially zero fatal and serious injuries

- Two approaches:
 1. Reduce speed to minimal level to avoid collisions or minimize risks
 2. Help improve protection for occupants, pedestrians / cyclists when crash is unavoidable



Source: Based on Nissan internal research data

22

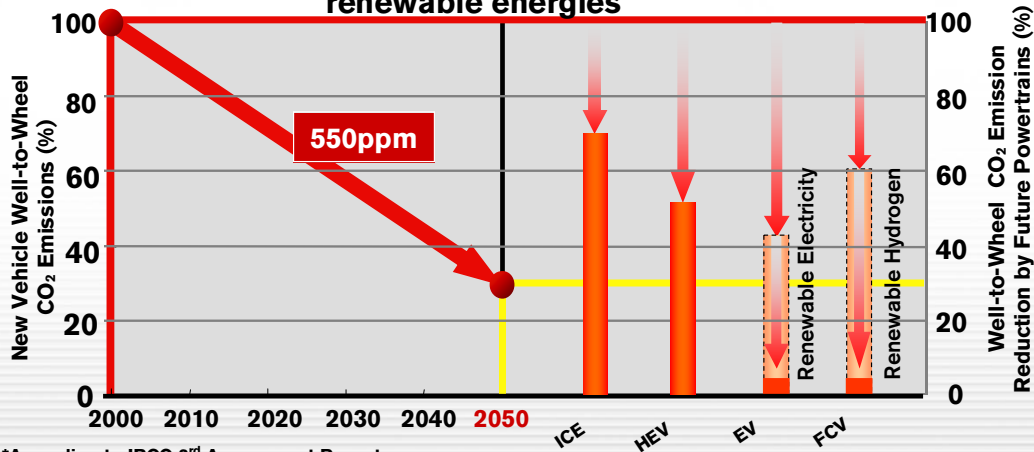
3. Environmental Technologies

Nissan Green Program 2010



Long-term Targets for CO₂ Reduction

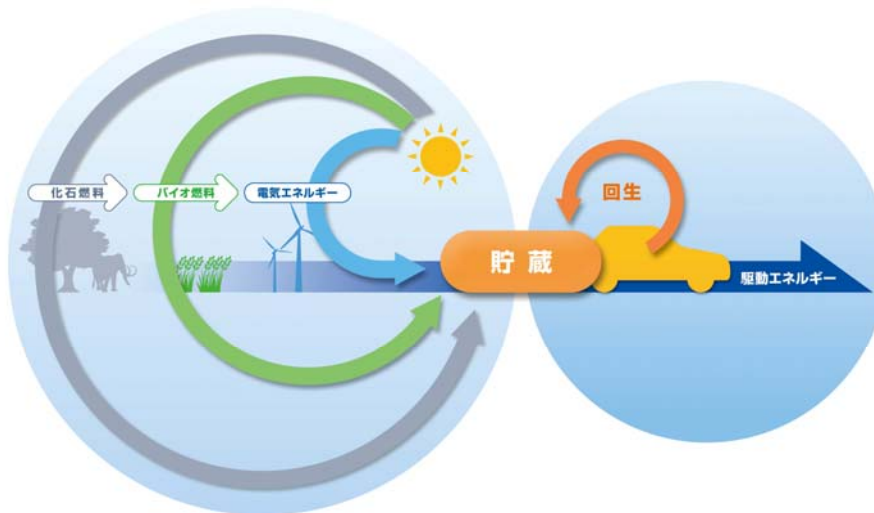
- To stabilize atmospheric CO₂ concentration below 550ppm*, CO₂ emissions from all new vehicles must be reduced by 70% compared to year 2000
- To achieve 70% CO₂ emissions reduction:
 - Short term: Improve engine fuel efficiency
 - Mid/Long term: Promote electric-powered vehicles, convert to renewable energies



*According to IPCC 3rd Assessment Report

Outline of Environmental Technology Development

- Develop environmental technology through 3 aspects:
 - Promote use of clean energies
 - Innovate energy storage technologies
 - Enhance vehicle energy efficiency



25

Technology Highlights

- Electric Vehicle Prototype
- Hybrid Vehicle
- Newly-developed laminated Li-Ion Battery
- Next-generation Fuel Cell Stack
- ECO Pedal (Eco-driving support system)
- HCCI (Homogeneous-Charge Compression Ignition)

26

Electric Vehicle

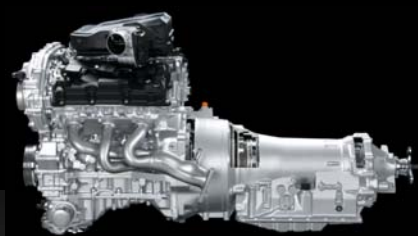
- To be introduced with a unique body-style in fiscal 2010
- Performance confirmation prototype developed for mass marketing



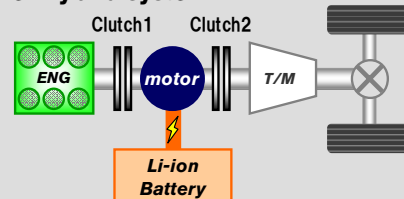
Hybrid Vehicle

- To be introduced on a new-model vehicle in fiscal 2010
- With power assist by the high power Li-ion battery, the vehicle balances driving pleasure and high fuel economy equivalent to a compact-type vehicle

Hybrid unit

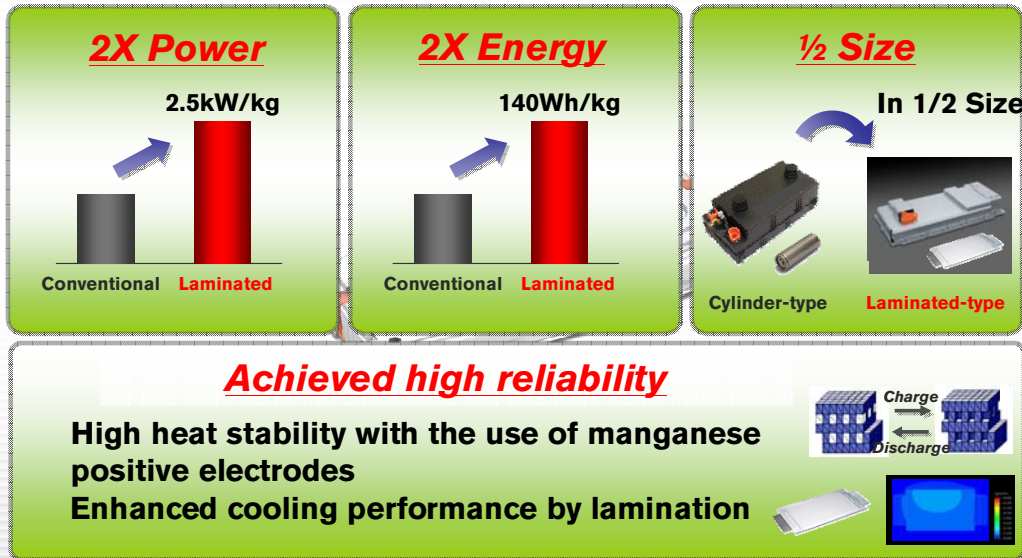


Parallel Hybrid system



Newly-developed Laminated Li-Ion Battery

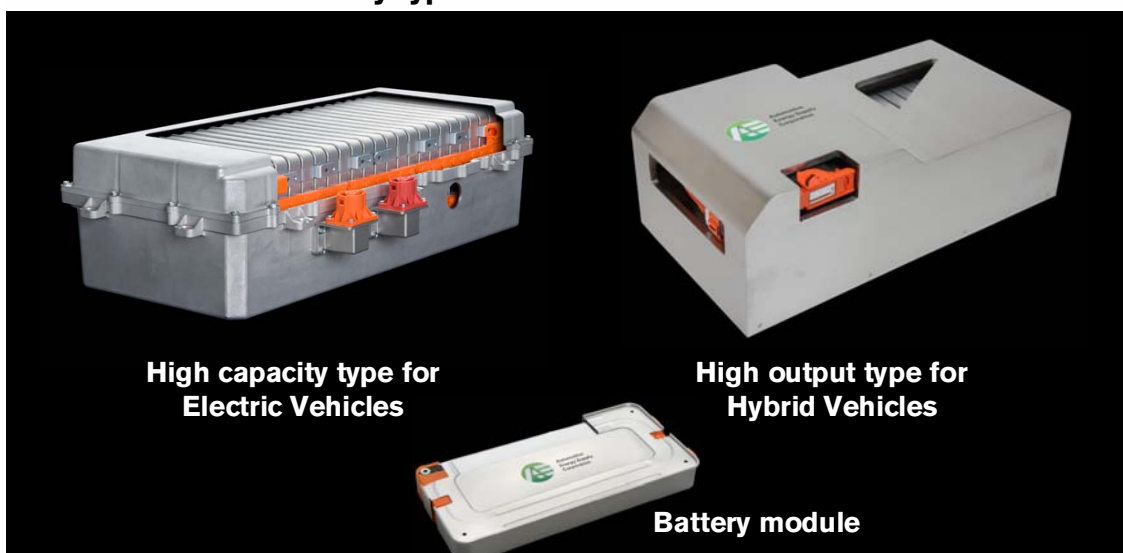
- To be implemented on hybrid and electric vehicles in fiscal 2010
- Advanced battery delivers high performance and high reliability



29

Newly-developed Laminated Li-Ion Battery

- For hybrid vehicles: Electric resistance has been reduced by changing the structure of the electrodes. Delivers 2X the power compared to conventional battery type.
- For electric vehicles: Changes in electrode material and thickness. Delivers 2X the capacity and 1.5X the power compared to conventional battery type.



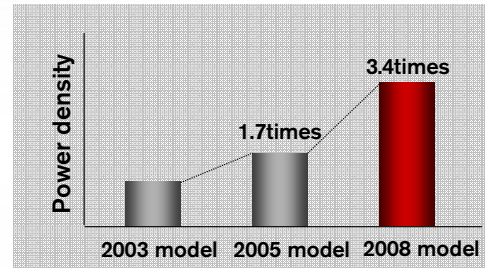
Next-generation Fuel Cell Stack

■ Compared to the 2005 stack model:

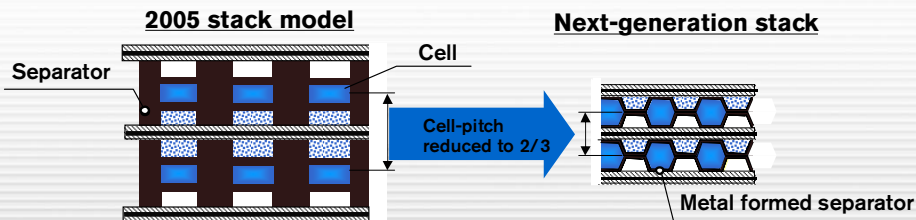
- Downsized by employing thin metal separators
- Higher output achieved via improved conductivity of the electrolyte layer within the Membrane Electrode Assembly



Higher power
➔



Downsized
↓

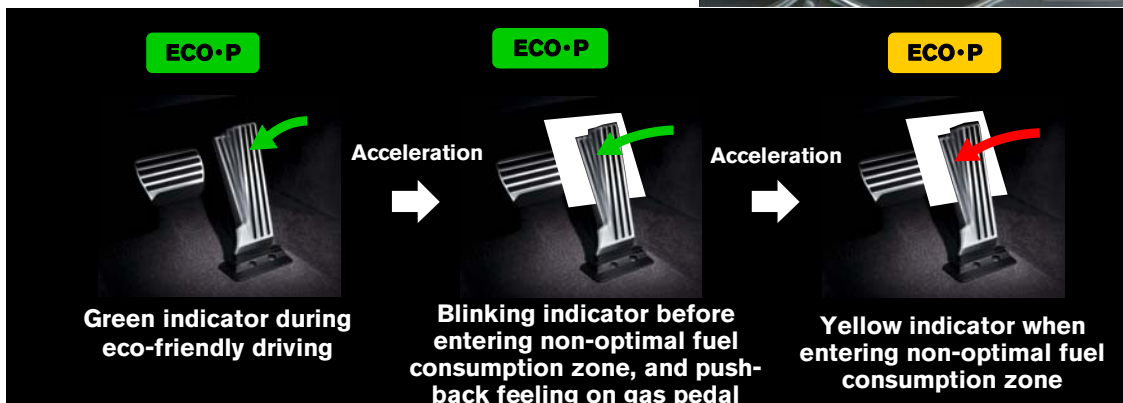


31

ECO Pedal

Test Drive Item

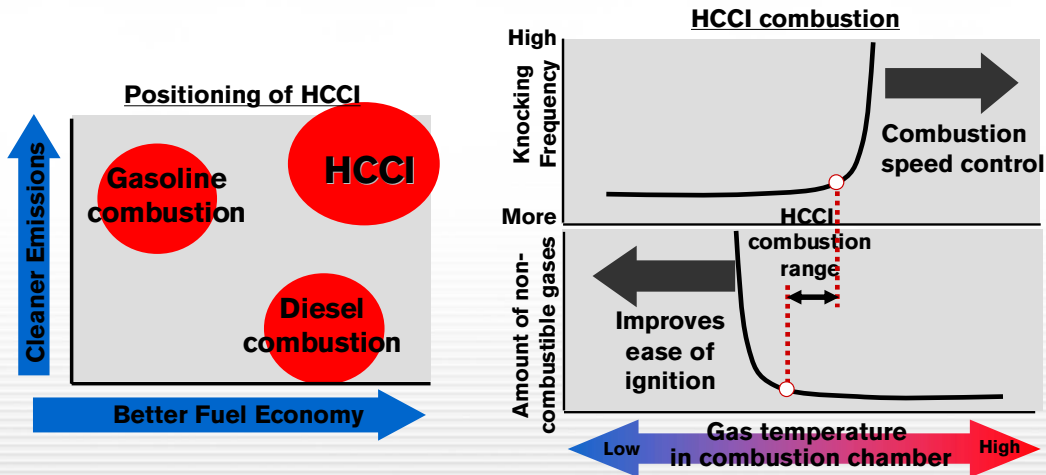
- To be introduced on a new-model vehicle in fiscal 2009
- Eco-driving support system with push-back information on gas pedal, supported by visual indicator, to inform the driver before non-optimal fuel consumption occurs.



32

HCCI (Homogeneous-Charge Compression Ignition)

- Ideal combustion condition - balancing fuel efficiency and cleaner emissions by adapting the benefits of gasoline engine (air-fuel mix combustion) and diesel engine (lean combustion)
- Challenge: How to stabilize “Condition-sensitive” HCCI combustion
- Key technology: High level control of HCCI combustion parameter



33

Gasoline Engine Technologies: HCCI

Homogeneous-Charge Compression Ignition

- High speed 3D simulation representing complex chemical reactions in the HCCI combustion process
- Acceleration in HCCI development



HCCI

34

Technology Highlights

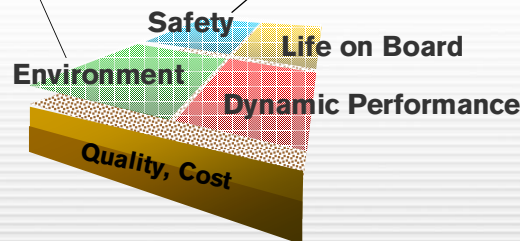
Environmental Technologies

- Electric Vehicle
- Hybrid Vehicle
- Newly-developed laminated Li-Ion Battery
- Next-generation Fuel Cell Stack
- HCCI
(Homogeneous Charge Compression Ignition)
- ECO Pedal



Safety Technologies

- Around View Monitor with Parking Guide
- GPS Mobile ITS for Pedestrian Safety
- All-Around Collision Free Prototype
 - Side Collision Prevention
 - Back-up Collision Prevention
- Smart Auto Headlight
- Intelligent Seatbelt
- Items to Promote Backseat Seatbelt Fastening



35

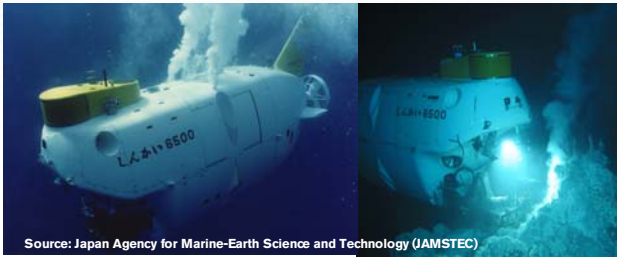
4. Application of Intellectual Assets

- Promote expansion of intellectual assets to other industries
- Emphasis on innovations in society and research development

36

Examples of Cross-Industrial Intellectual Asset Licensing

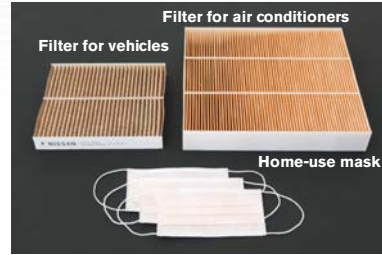
Around View Monitor



Source: Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Example: application on the Shinkai 6500 submarine

Grape Polyphenol Filter



Example: application in air conditioners for apartments



Source: Shin Caterpillar Mitsubishi Ltd.

Example: application on large heavy machinery

Far-Infrared Ray Image Sensor



Source: Chino Corporation

Example: simplified health management of farm animals