Challenges for Sustainable Mobility

*Toyota Business Strategy Meeting 2007*
Challenges to Deliver Mobility for a Sustainable Society

- CO2 reduction
- Effective utilization of alternative fuels
- Cleaner emissions

Development of appealing products

Safety
Diesel Engine Lineup

- 1.4 litre
- 1.6 litre class
- 2.0-2.2 litre
- 2.5-3.0 litre
- V8 4.5 litre

To be introduced

Wide array of diesel engines and increased production

CO₂ Reduction
Cleaner Emissions

Reached 1 million units per year
Advanced Clean Diesel Technology

Advantage

- Fuel economy improvement
- Low emission
- High output
- Low noise

Toyota D-CAT System

- Low Compression Ratio
  - Ceramic Glow Plug
- Common Rail System
  - Piezo Injector
- High Pressure Injection
  - 180MPa~
- Variable Nozzle Turbo Charger
- DPNR (Diesel Particulate – NOx Reduction System)

Early introduction of advanced diesel engine

CO₂ Reduction
Cleaner Emissions
Clean Emission Technology

**Cleaner emissions by introduction of new engine**

- **1992 NSR**: application for patent
- **1994** Start production of NSR catalyst for gasoline engine
- **2003** Start production of DPNR catalyst for diesel engine

**History of Toyota’s after-treatment technology**

We have been offering licensing of NSR to multiple car manufactures, and this seems likely to continue.

**NSR**: NOx Storage Reduction Catalyst

**DPNR**: Diesel Particulate – NOx Reduction System

**Promotion of emission treatment (original technology and production)**
Environmental Superiority of Hybrid Vehicles

HV contributes to CO2 reduction

CO2 (g/km) vs. Mass

- Gasoline
- Diesel
- HV

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Annual Sales Volume of Hybrid Vehicles

(1000 units/year)


Further evolution of HV and plan of expansion to more models

CO₂ Reduction

1 million units per year

Cumulative sales of 1 million worldwide

Cost reduction, Downsizing, Battery development
Efforts to Utilize Alternative Fuel

Bio-fuel
- Flex Fuel Vehicle
- Advanced bio research
- Quality improvement of conventional bio-fuel

Hydrogen
- Fuel Cell Hybrid Vehicle

Electric
- Plug-in Hybrid Vehicle

CO₂ Reduction
Promotion of alternative fuels
Plug-in Hybrid Vehicle

Charge battery from external charging, and expand EV driving range by motor

- PHV runs by motor charged by electricity for short range
- PHV runs by engine and motor for longer distances, high speed, and hill-climbing

A practical way to use electricity
Superiority of Toyota PHV

Toyota selected HV-based PHV considering driving range, battery size, charge time, etc.

CO₂ Reduction
Promotion of alternative fuels
Toward Development of Appealing Products

- Package Revolution
- Provide with Low Cost
- Fun to Drive

Improve product competitiveness by development of appealing products and cost reduction technology
Partner Robot Development

Promote robot development in four areas that assist people:

- Housework assistance
- Personal transfer assistance
- Nursing care/medical assistance
- Manufacture assistance

TPR-ROBINA

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R&D Global Offices

North America

Southeast Asia

Japan

Europe

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