

Challenges for Sustainable Mobility

Information Meeting

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Toyota Motor Corporation

Challenges to Deliver Mobility for a Sustainable Society

Zeronize



CO₂ reduction

**Effective utilization of
alternative fuels**

Cleaner emissions

Safety

Maximize

**Development of
appealing products**



Advanced Gasoline Engine Technology

Major Technologies

Direct Injection System

Variable Valve Drive System

-VVT-iE
-Valvematic

Low Friction

**Downsizing/
Weight Reduction**

Turbo Charger

Lean Burn System

Advantage

**Fuel economy
improvement**

High output



Realize high output and better fuel economy by technology development and expansion into additional models

Diesel Engine Lineup

CO₂ Reduction

Cleaner Emissions

1.4 litre



1.6 litre class

To be introduced

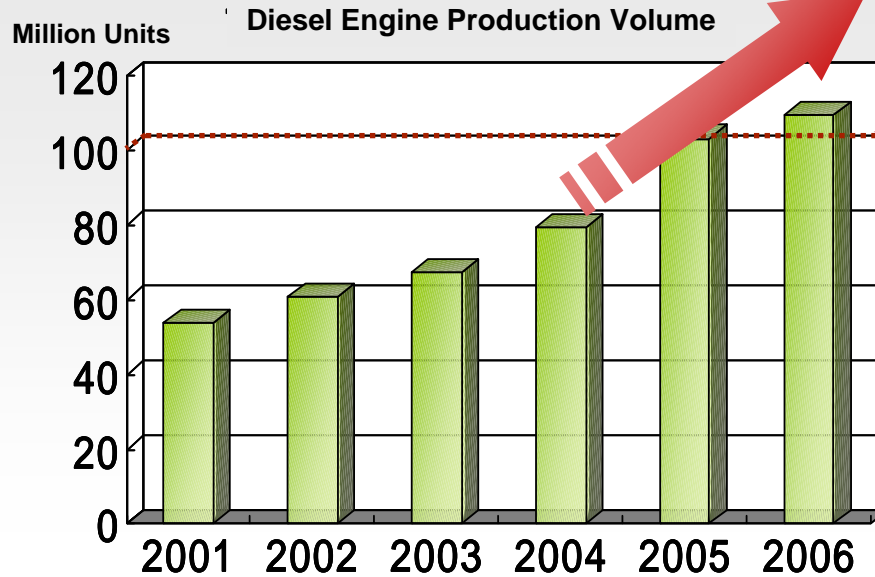
2.0-2.2 litre



2.5-3.0 litre



V8 4.5 litre



Reached 1 million units per year

Wide array of diesel engines and increased production

Advanced Clean Diesel Technology

Toyota D-CAT System

Advantage

Fuel economy improvement

Low emission

High output

Low noise

Low Compression Ratio

-Ceramic Glow Plug

Common Rail System

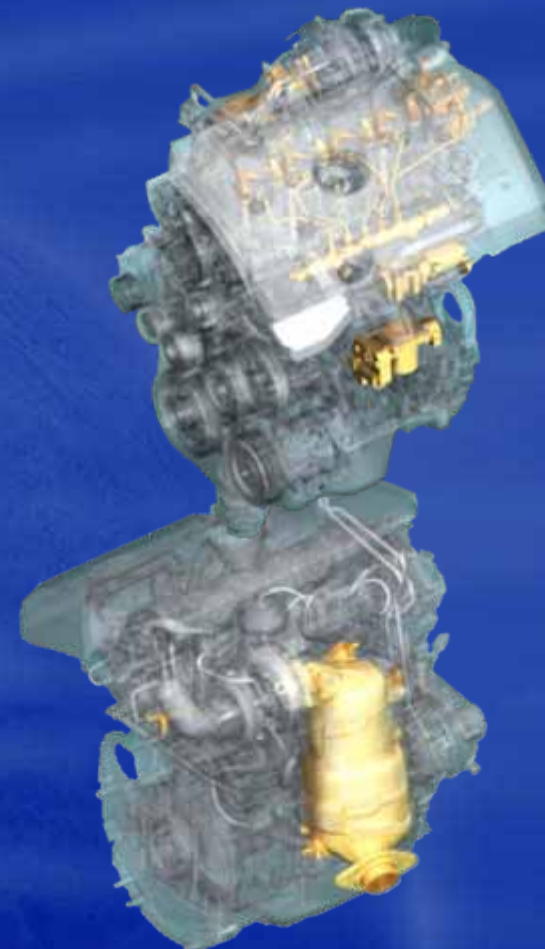
-Piezo Injector

High Pressure Injection

180MPa~

Variable Nozzle
Turbo Charger

DPNR (Diesel Particulate –
NOx Reduction System)



Early introduction of advanced diesel engine

Clean Emission Technology

History of Toyota's after-treatment technology

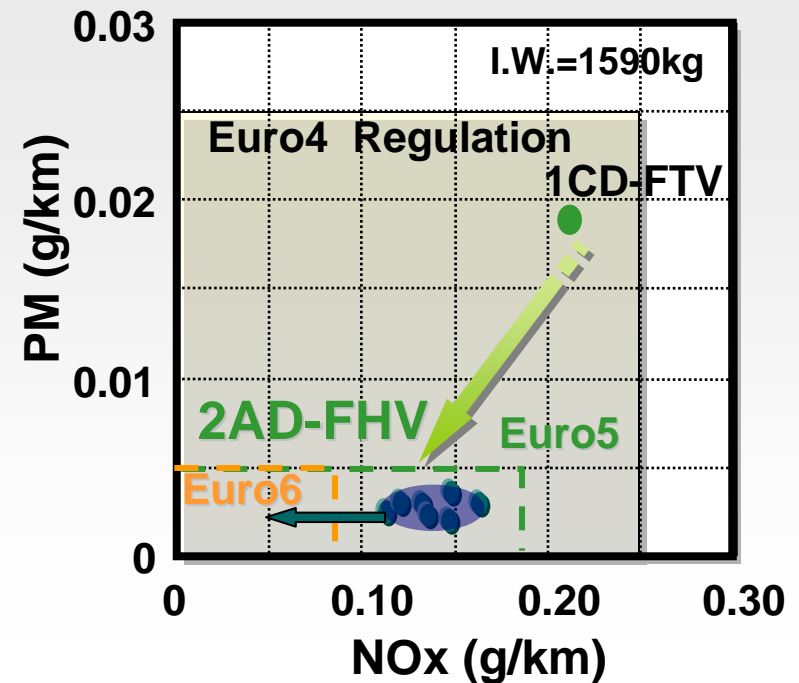
- 1992 NSR: application for patent
- 1994 Start production of NSR catalyst for gasoline engine
- 2003 Start production of DPNR catalyst for diesel engine

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

NSR : NOx Storage Reduction Catalyst

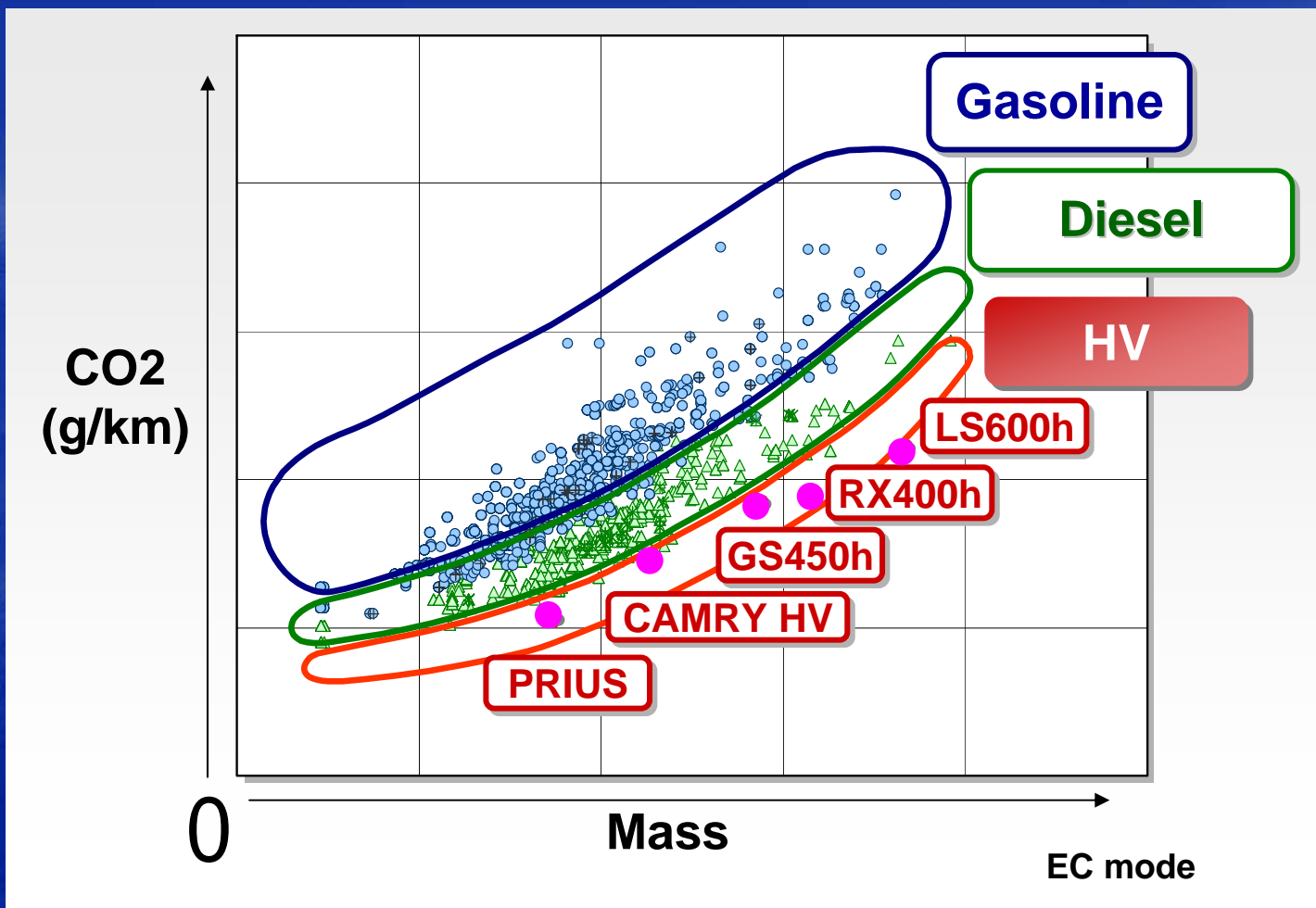
DPNR : Diesel Particulate – NOx Reduction System

Cleaner emissions by introduction of new engine



Promotion of emission treatment (original technology and production)

Environmental Superiority of Hybrid Vehicles

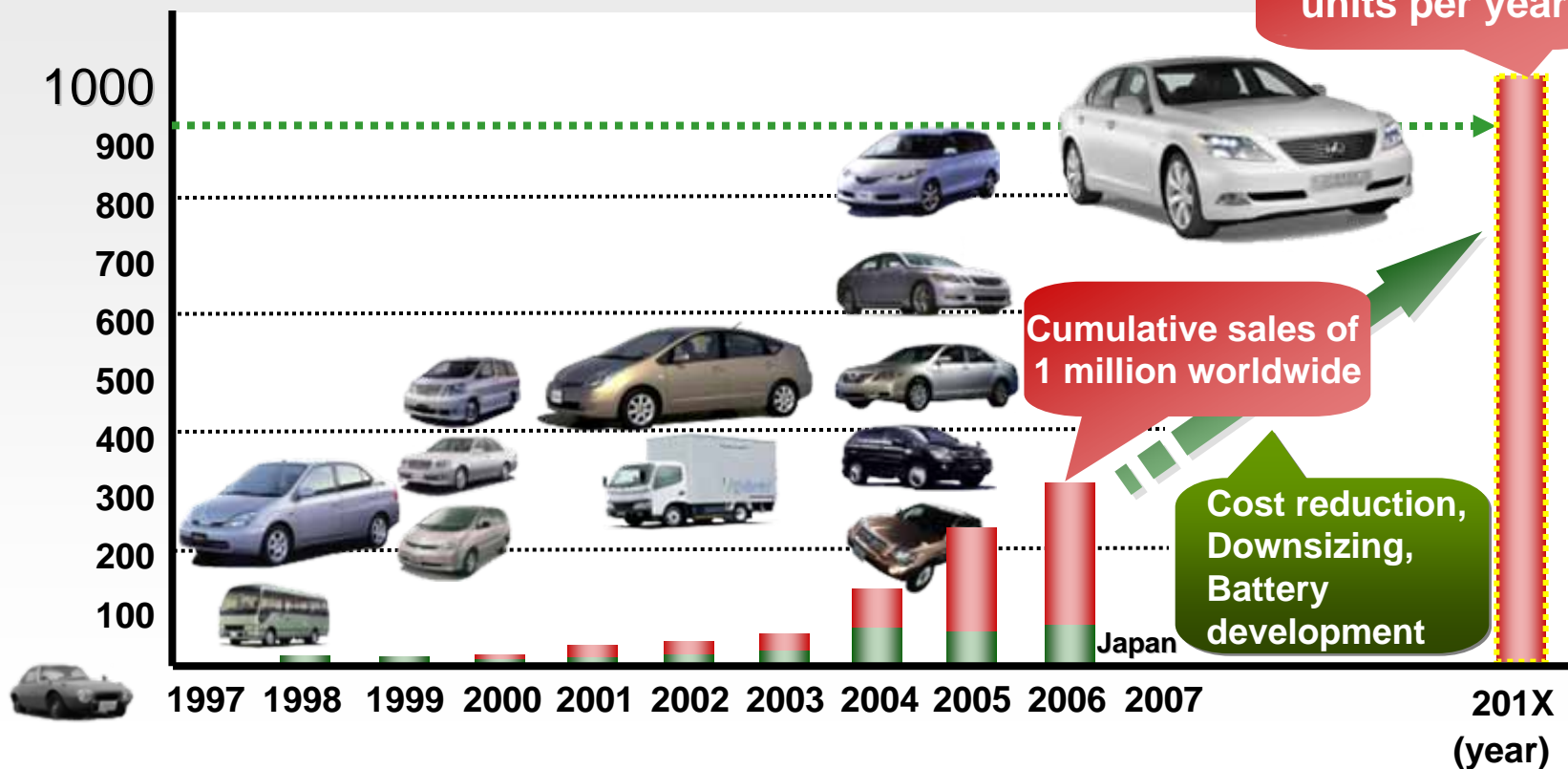


HV contributes to CO2 reduction

TOYOTA

Annual Sales Volume of Hybrid Vehicles

(1000 units/year)



Further evolution of HV and plan of expansion to more models

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

FFV



FCHV



Plug in HV



Plug-in Hybrid Vehicle

CO2 Reduction

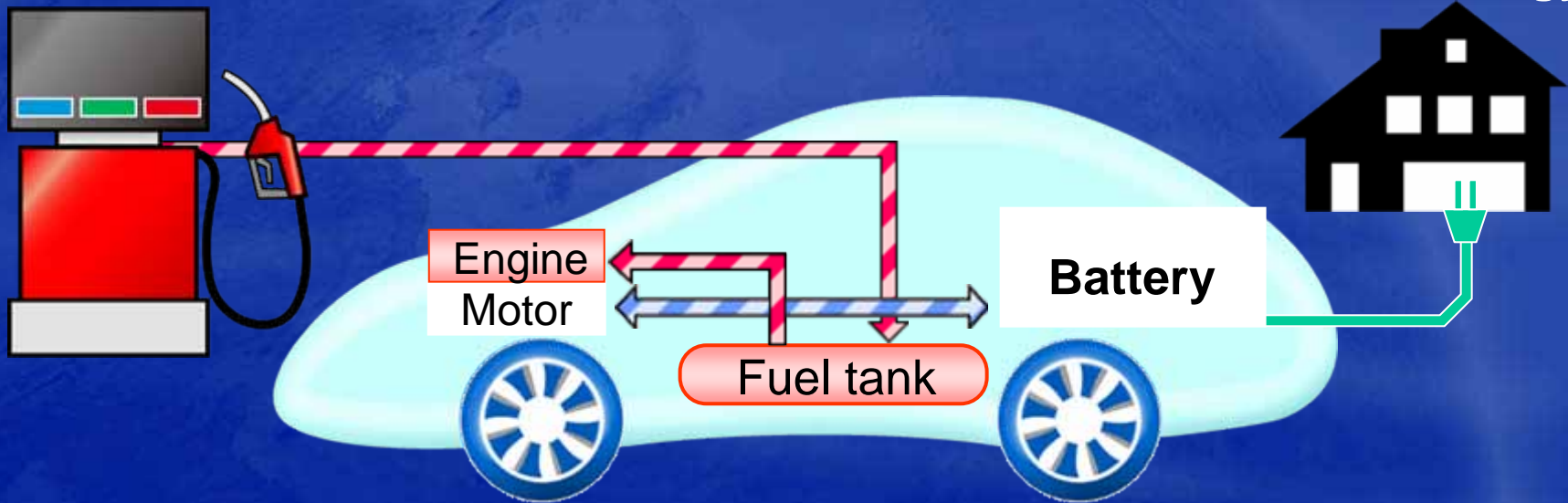
Promotion of alternative fuels

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

Gas Station

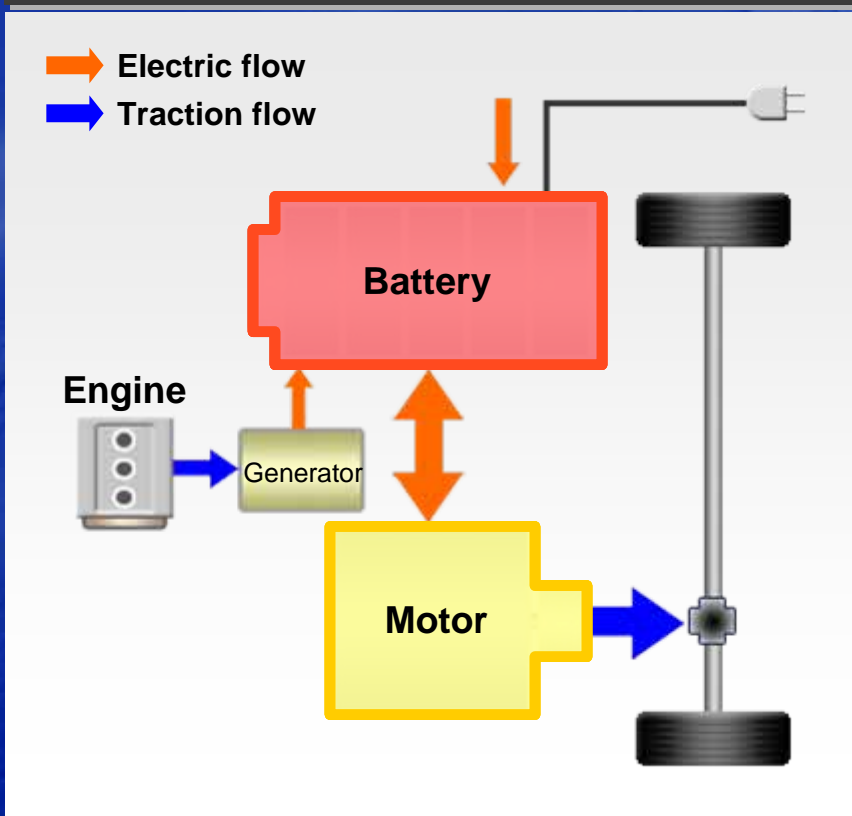
Household Electrical Energy



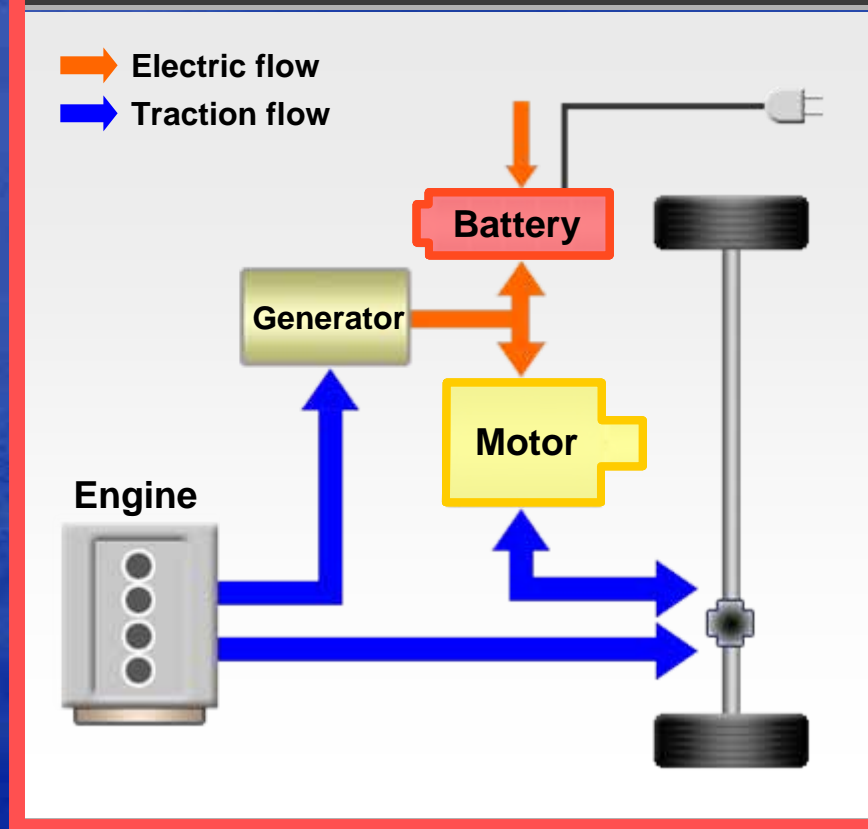
A practical way to use electricity

Superiority of Toyota PHV

EV-based PHV

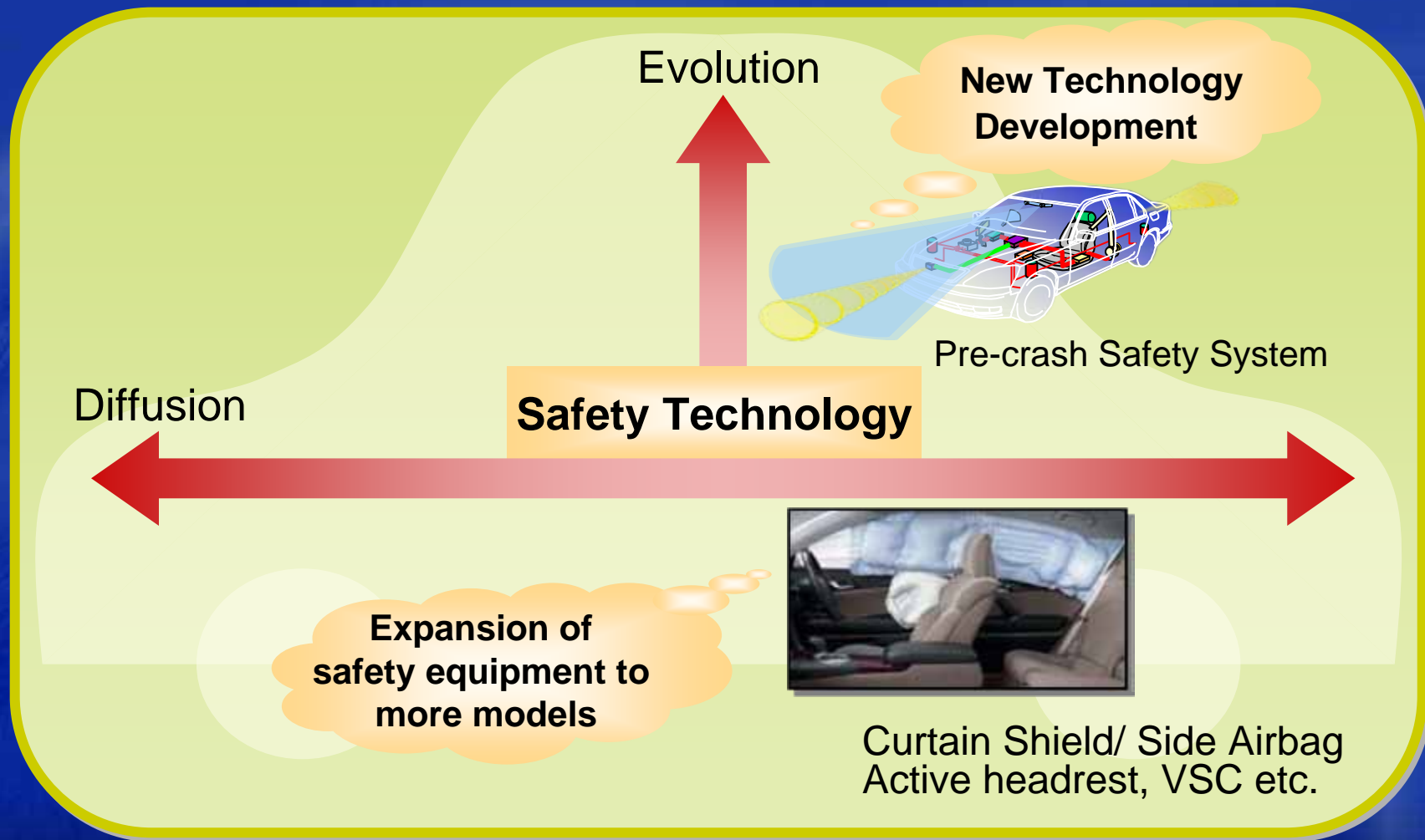


HV-based PHV (Toyota PHV)



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

Safety Technology Development/ Equipment Diffusion



Advancement of the System (Pre-crash Safety)

2004 Crown Majesta
(Japan)

Front Camera

2006 GS450h

Driver Monitor
Camera

2003 Harrier
(Japan)

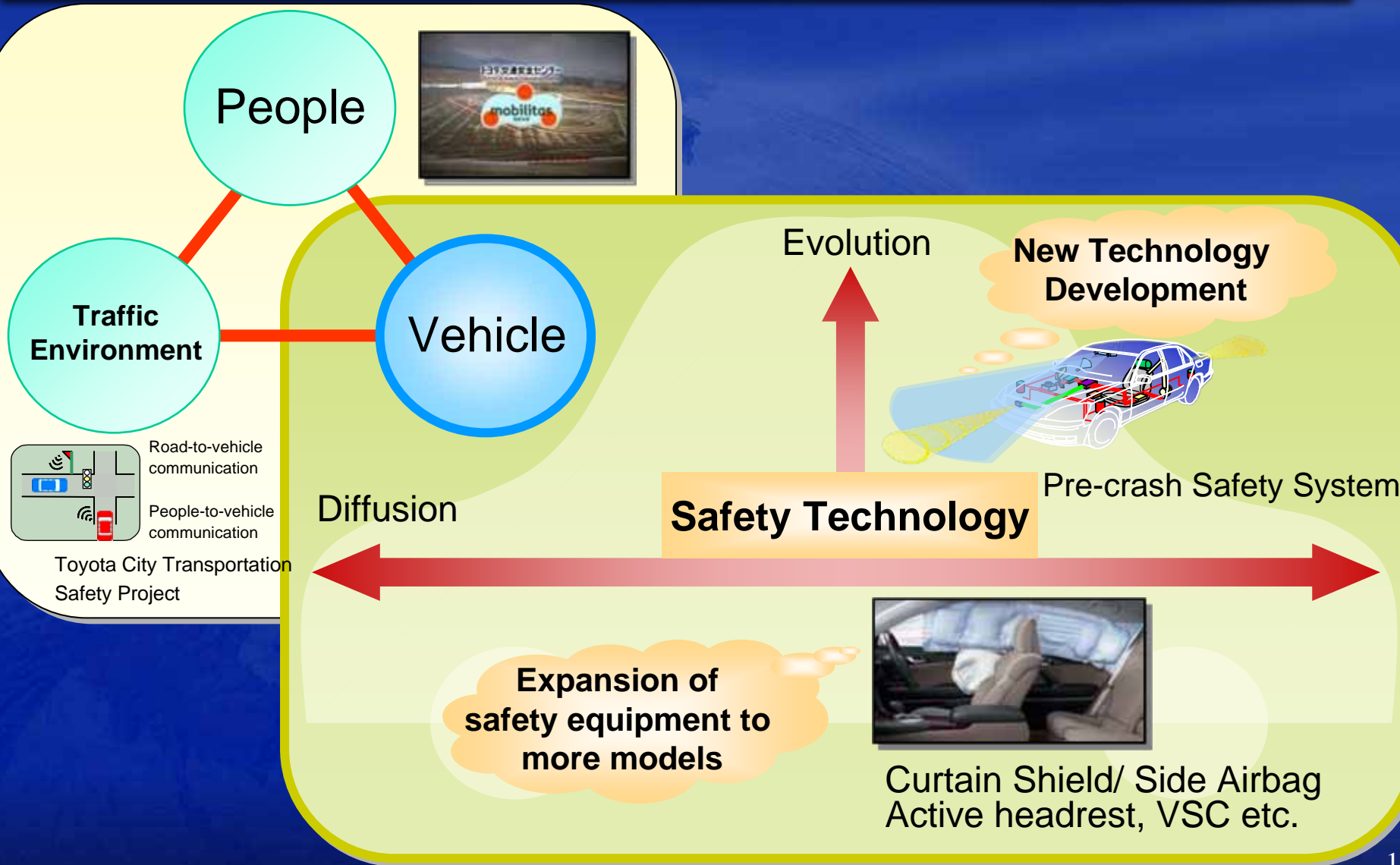
Front
Millimeter-wave Radar

Front Stereo Camera
Rear Millimeter-wave Radar

2006 LS460
2007 LS600h

Detection of pedestrian
Evolution to higher level omni-directional detection

Three Aspects for Better Safety



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Toward Development of Appealing Products

Development of
Appealing Products

Package
Revolution

Provide with
Low Cost

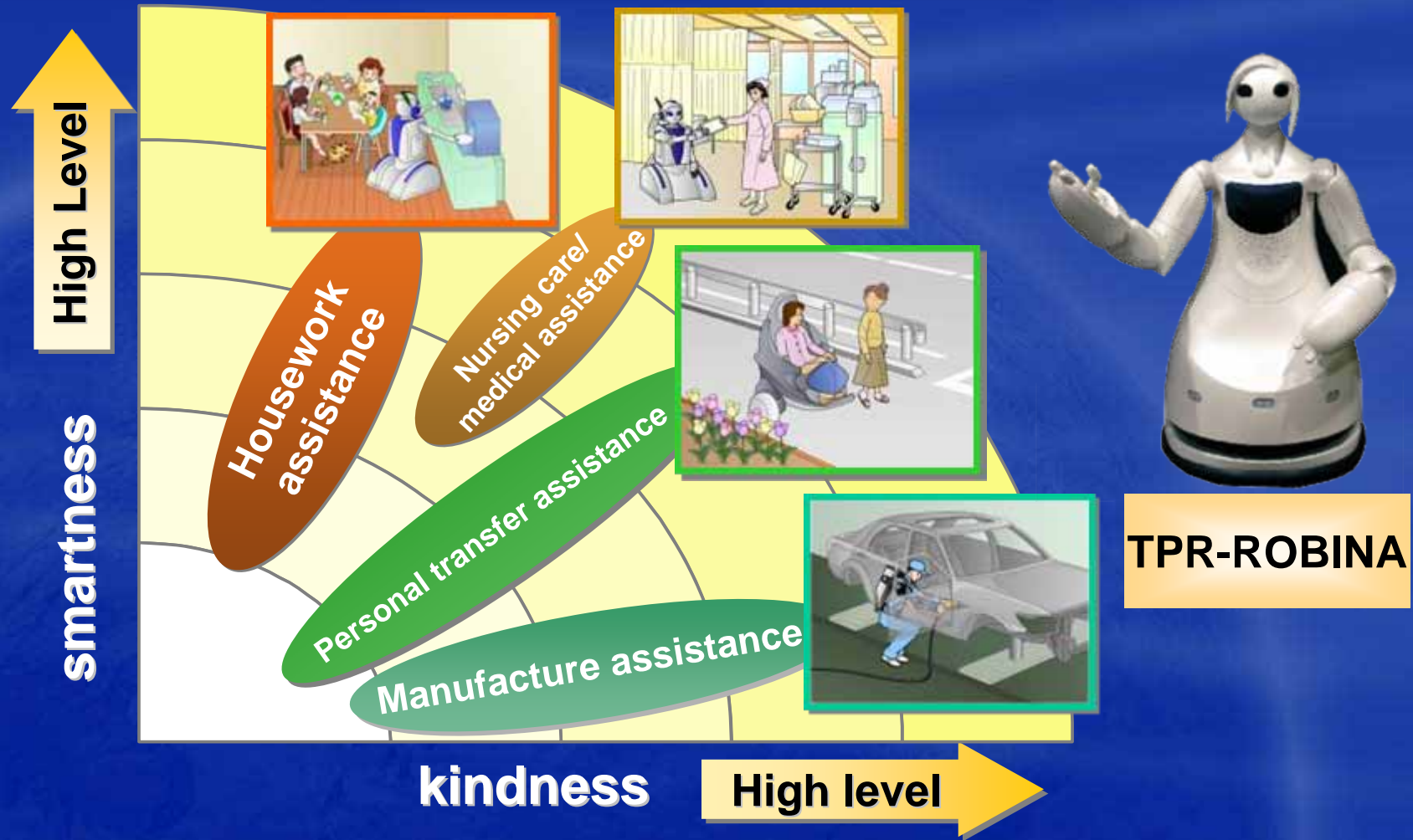
Fun to Drive



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

TOYOTA

Partner Robot Development



Promote robot development in four areas that assist people

R&D Global Offices

North America



Southeast Asia



Japan



Europe



Australia



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