

# Toyota



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# Toyota – Europe and UK

## *Europe:*

- Began selling cars in 1963
- Over €6 billion invested since 1990 in manufacturing, sales, parts and logistics networks as well as R&D, Design and Formula One
- Over €5 billion/year spent with European suppliers each year
- 1,124,000 vehicles sold during 2006 with 5.8% market share

## *UK:*

- Over 5,000 employees (manufacturing and sales); £1.75billion invested to date
- Vehicle manufacturing in Derby, engines manufacturing in Deeside, sales & marketing in Epsom
- Largest manufacturing capacity for Toyota in Europe of 285,000 vehicles per annum
- 140,000 vehicles sold in 2006 (8300 hybrids, i.e. 5.9%)

# Content

Environmental challenges

Toyota's Environmental Approach

Hybrid Technology

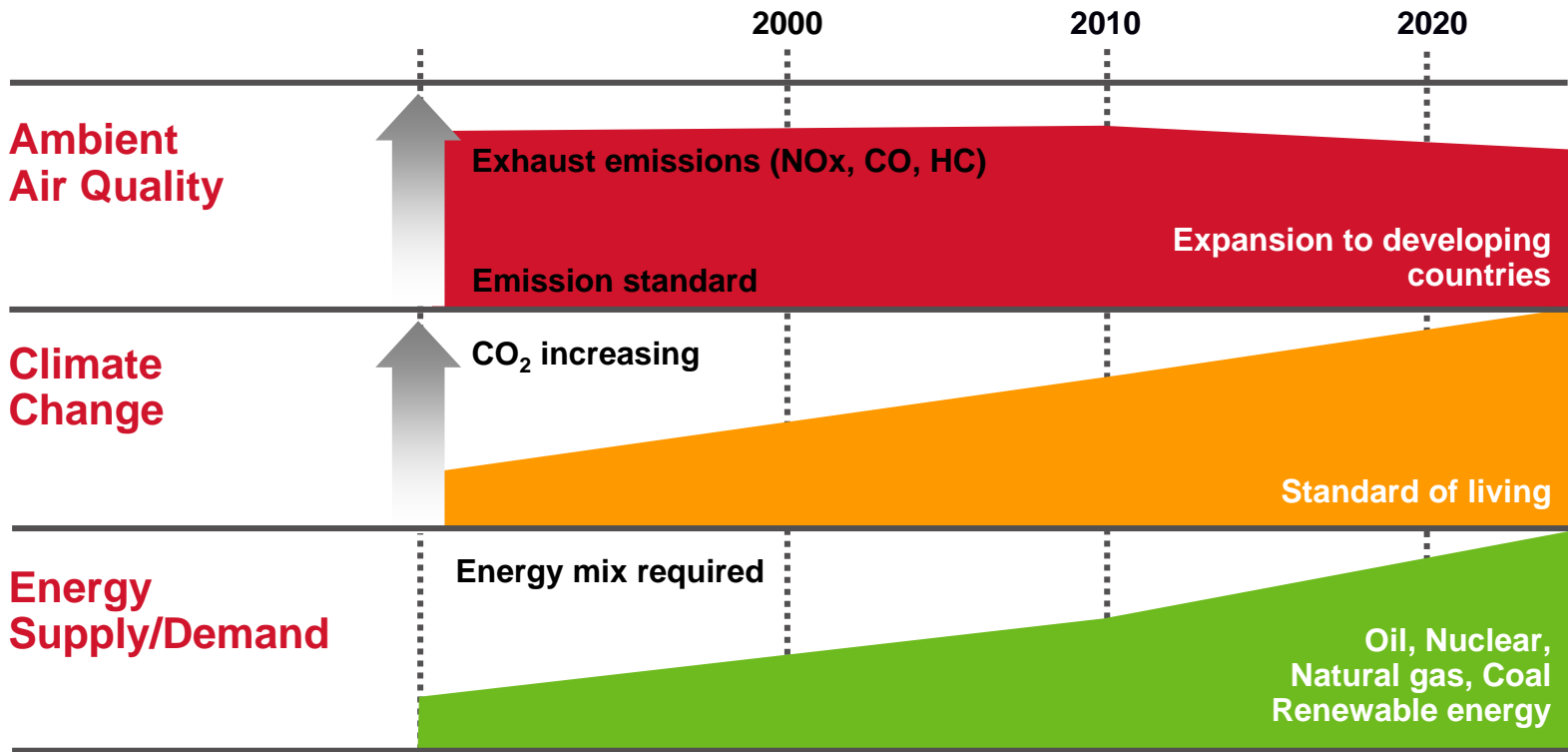
Market Challenges

Future Outlook

Conclusion

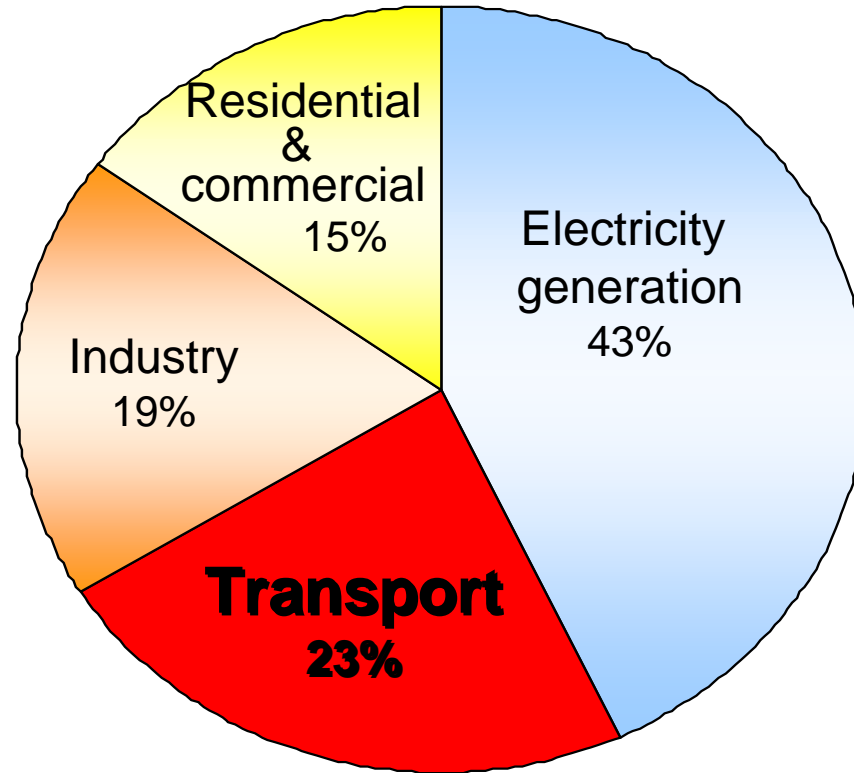
# Environmental Challenges

# Key challenges



Source: Toyota Motor Corporation

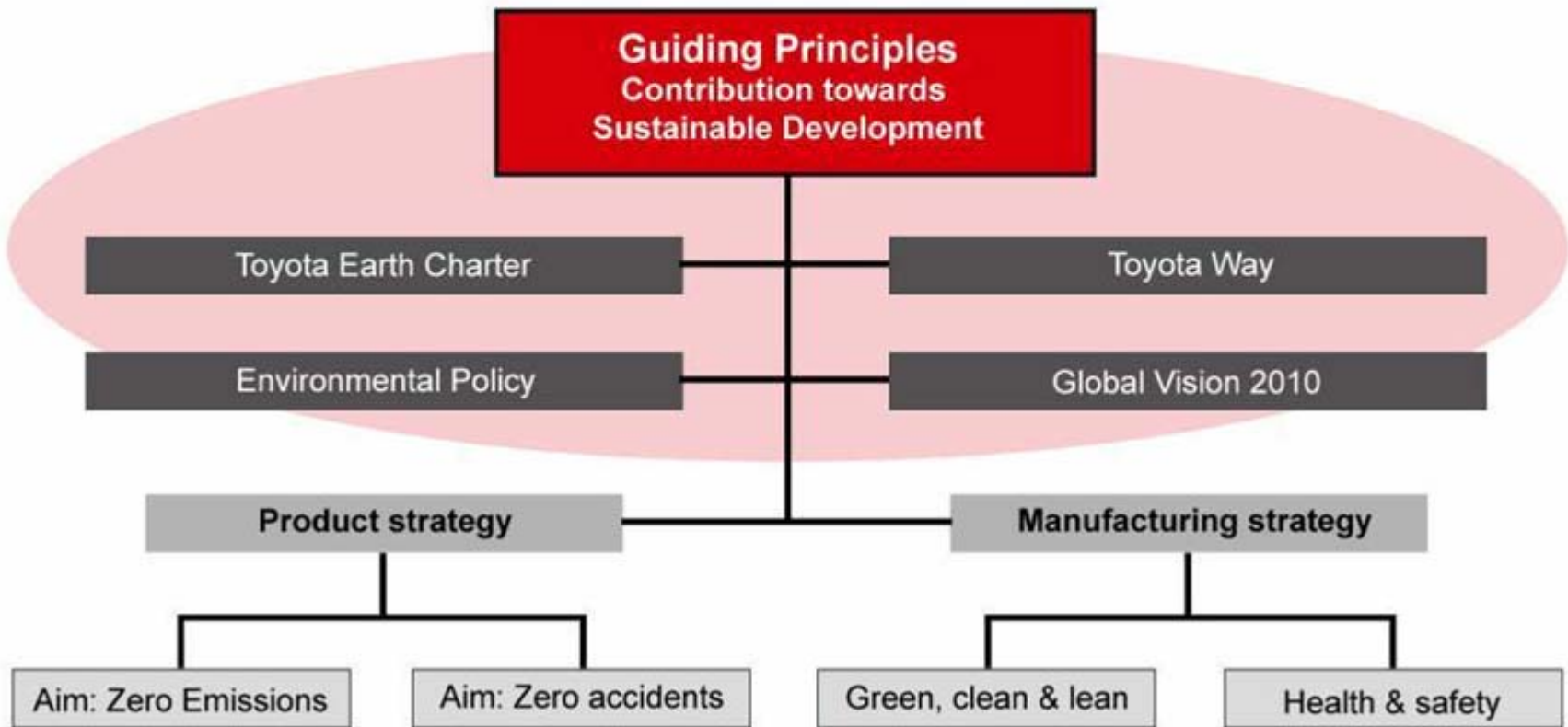
# CO<sub>2</sub> Emissions by Sector



Source: IEA/WEO 2004  
2002 data

# Toyota's Environmental Approach

# Guiding Principles





# Clean, green and lean production...

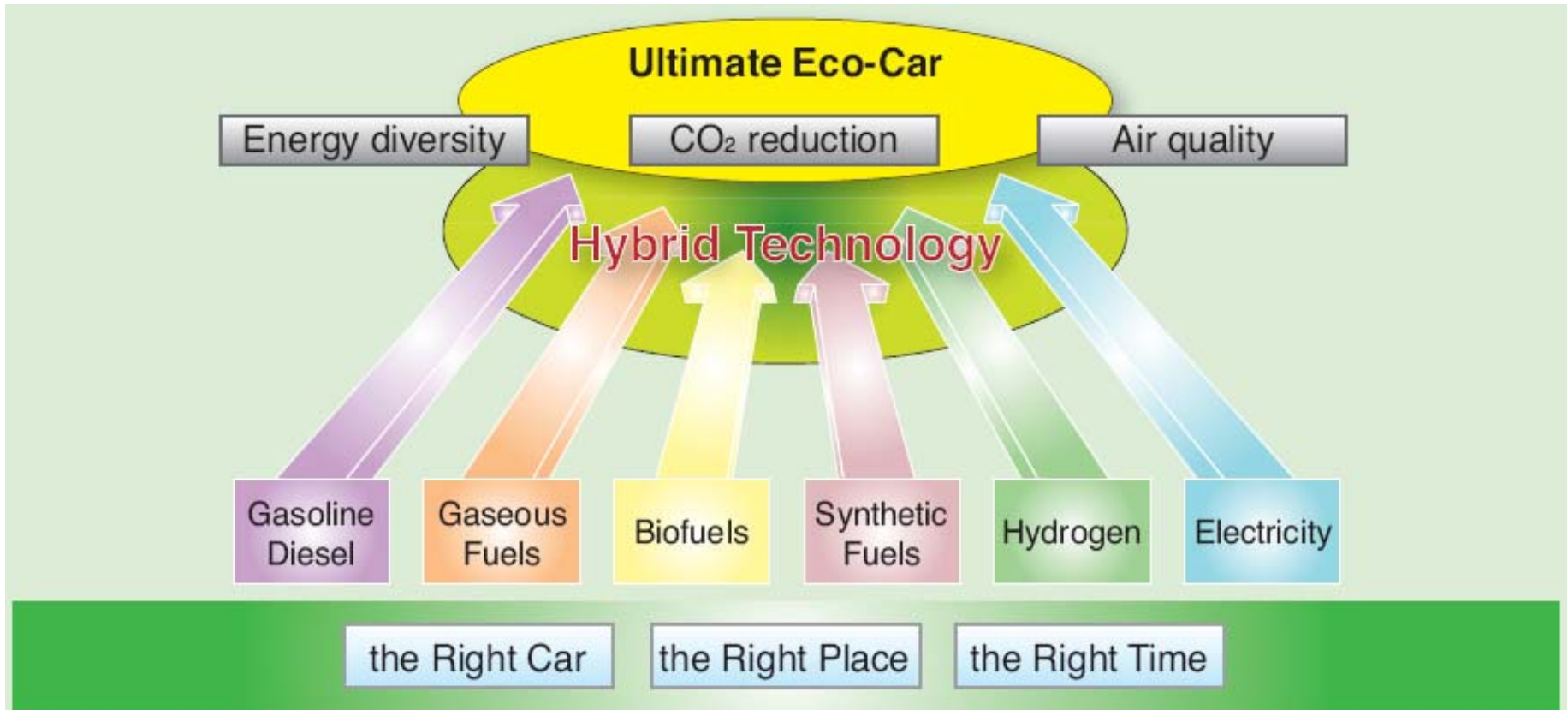


- Zero waste to landfill
- ISO 14001 certification
- Energy reduction
- Reduce VOCs
- Green purchasing guidelines for suppliers



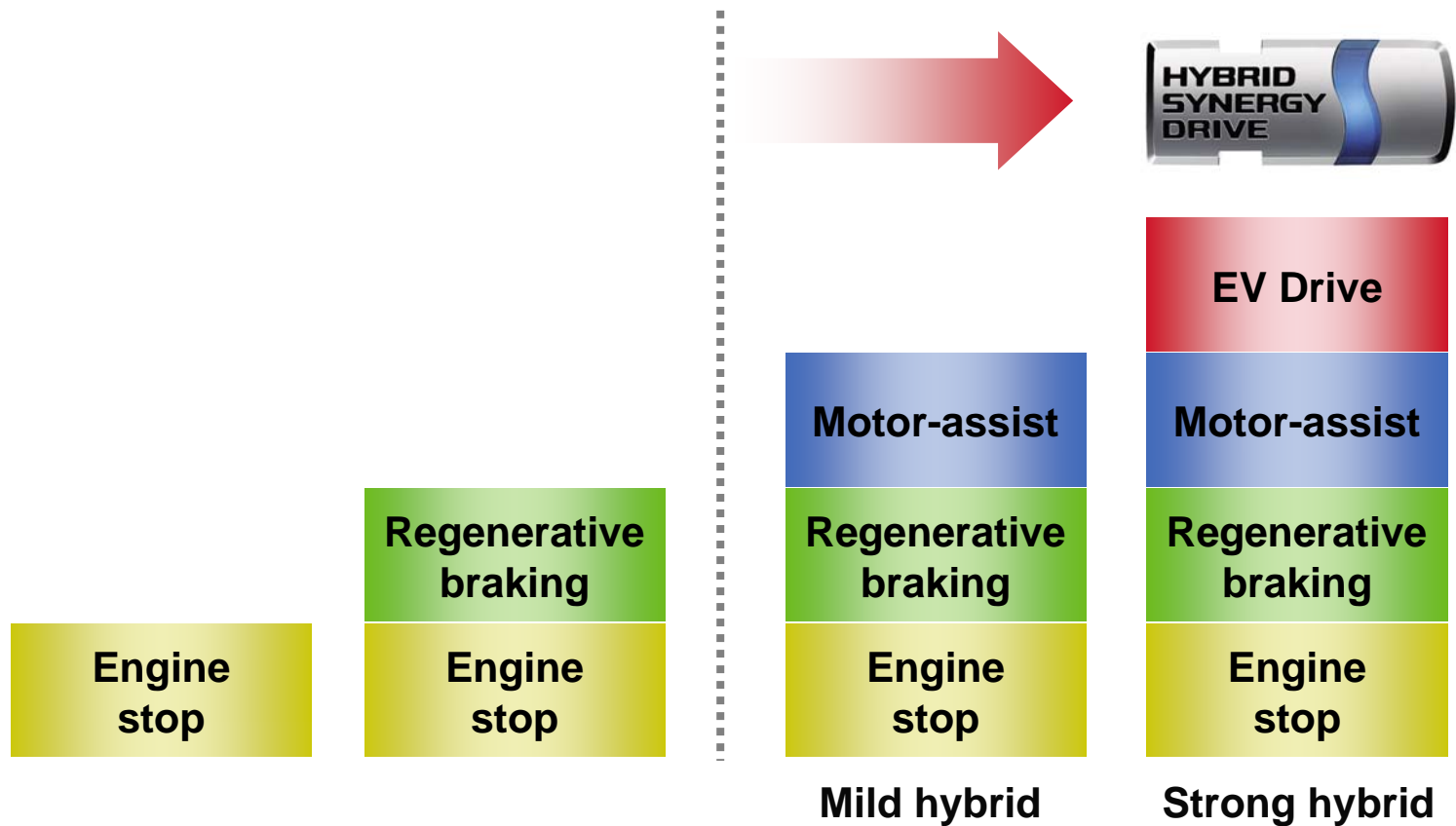
# Hybrid Technology

# Toward the Ultimate Eco-Car

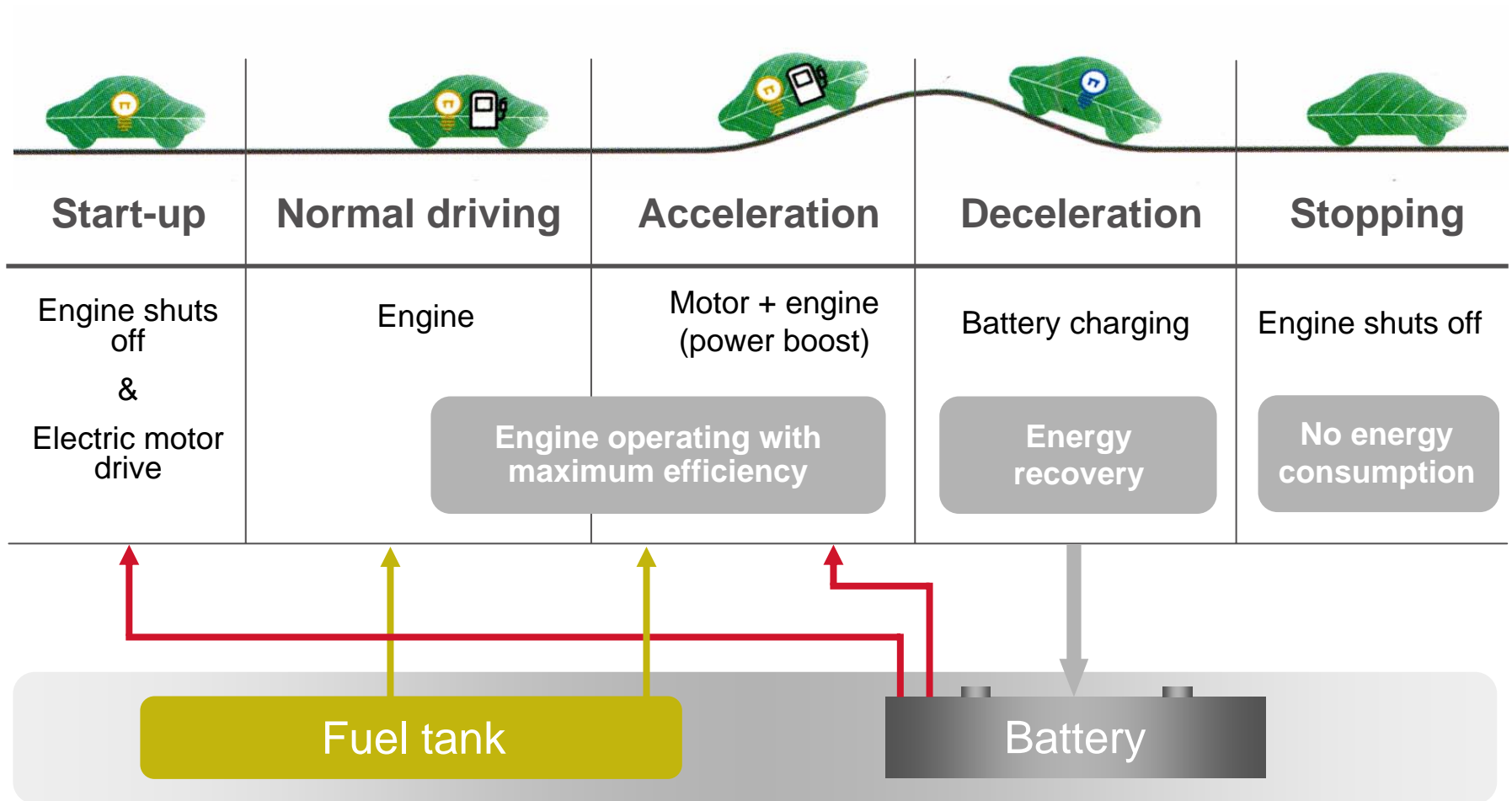


**Hybrid technology boosts performance for all powertrain systems**

# What is hybrid?



# Why Hybrids are efficient

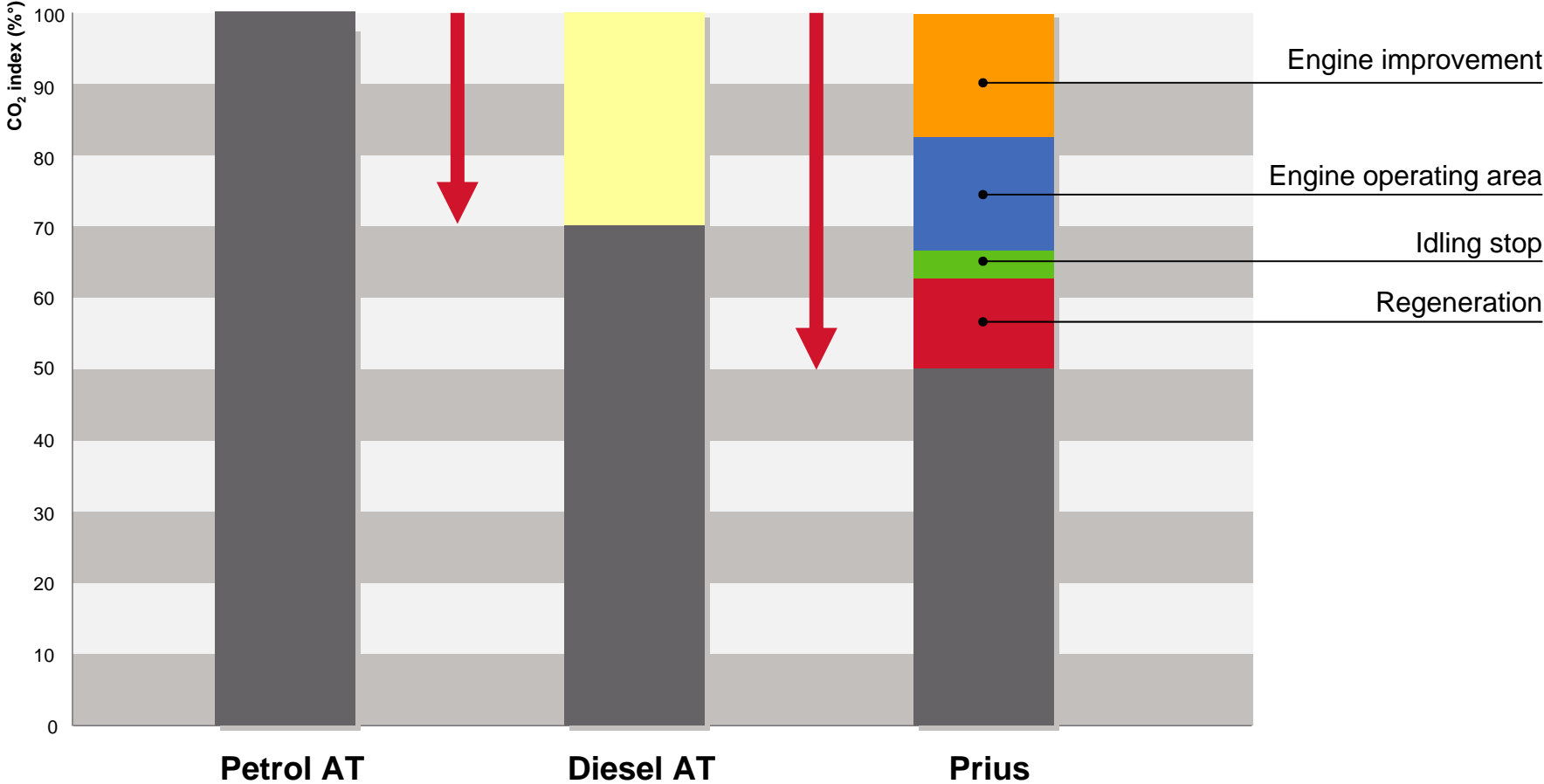


# Benefits

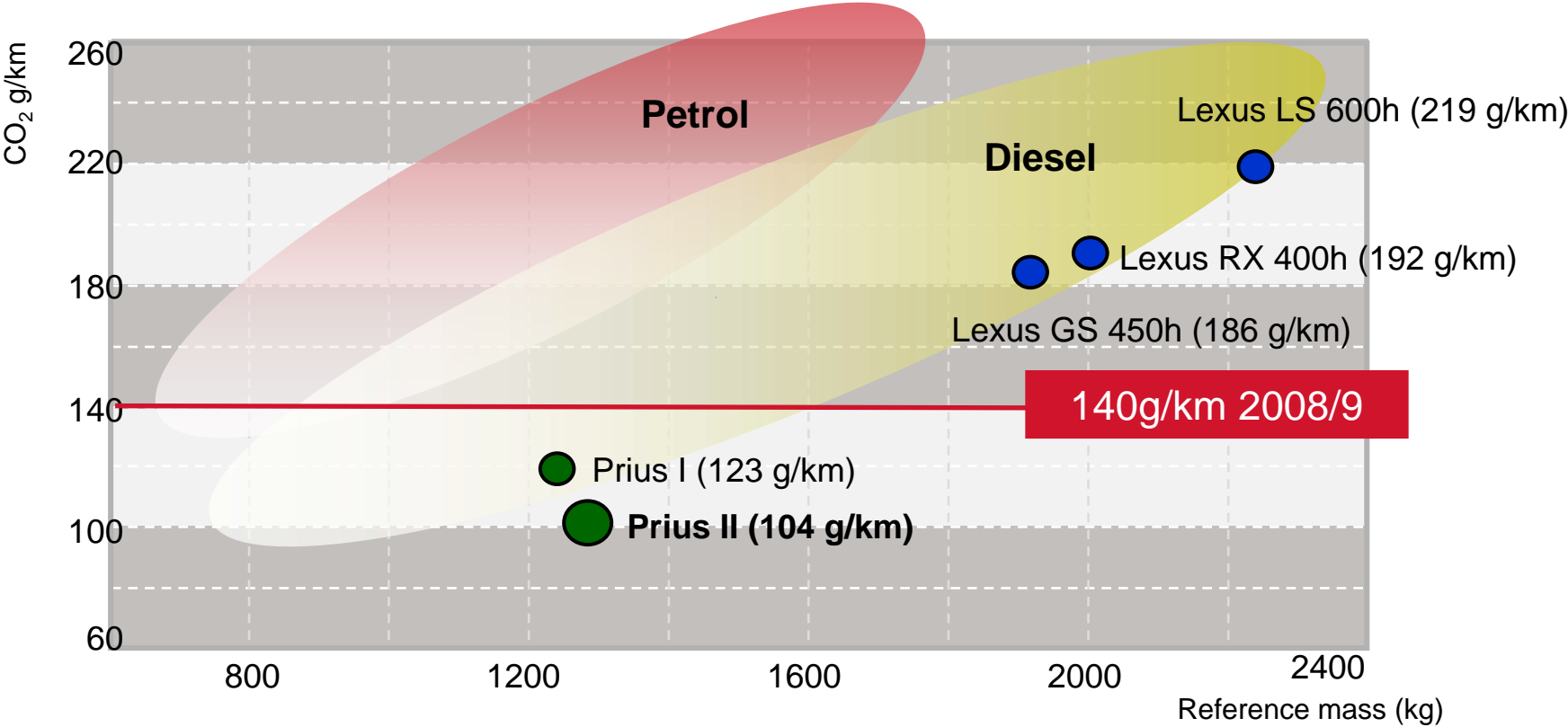
- **Fuel efficiency**
- **Low emissions**
- Driving performance
- Comfort
- Cost of ownership



# Potential of CO<sub>2</sub> reduction performance



# Comparison of CO<sub>2</sub> emissions

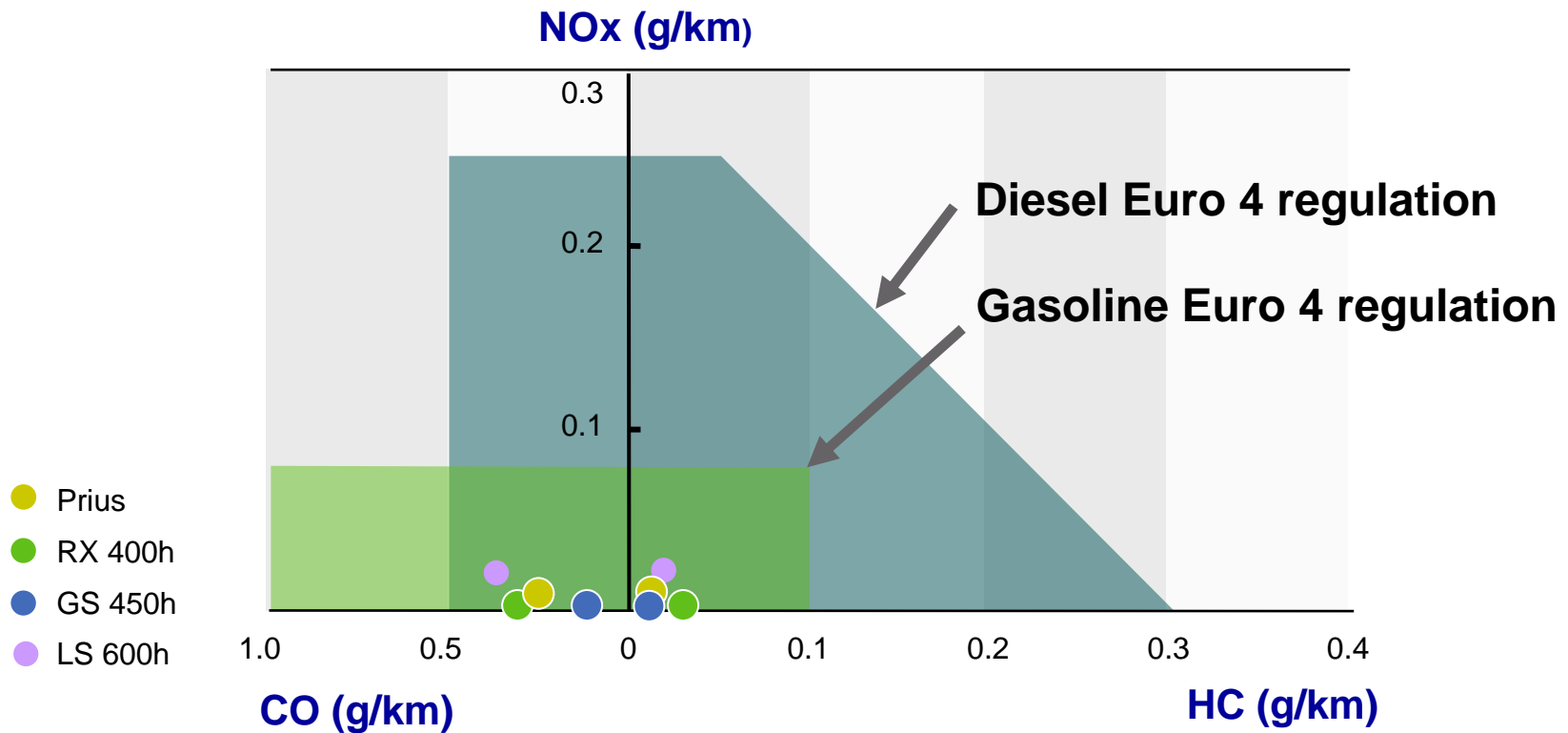


Source: Toyota



# Air Quality: Emission Result

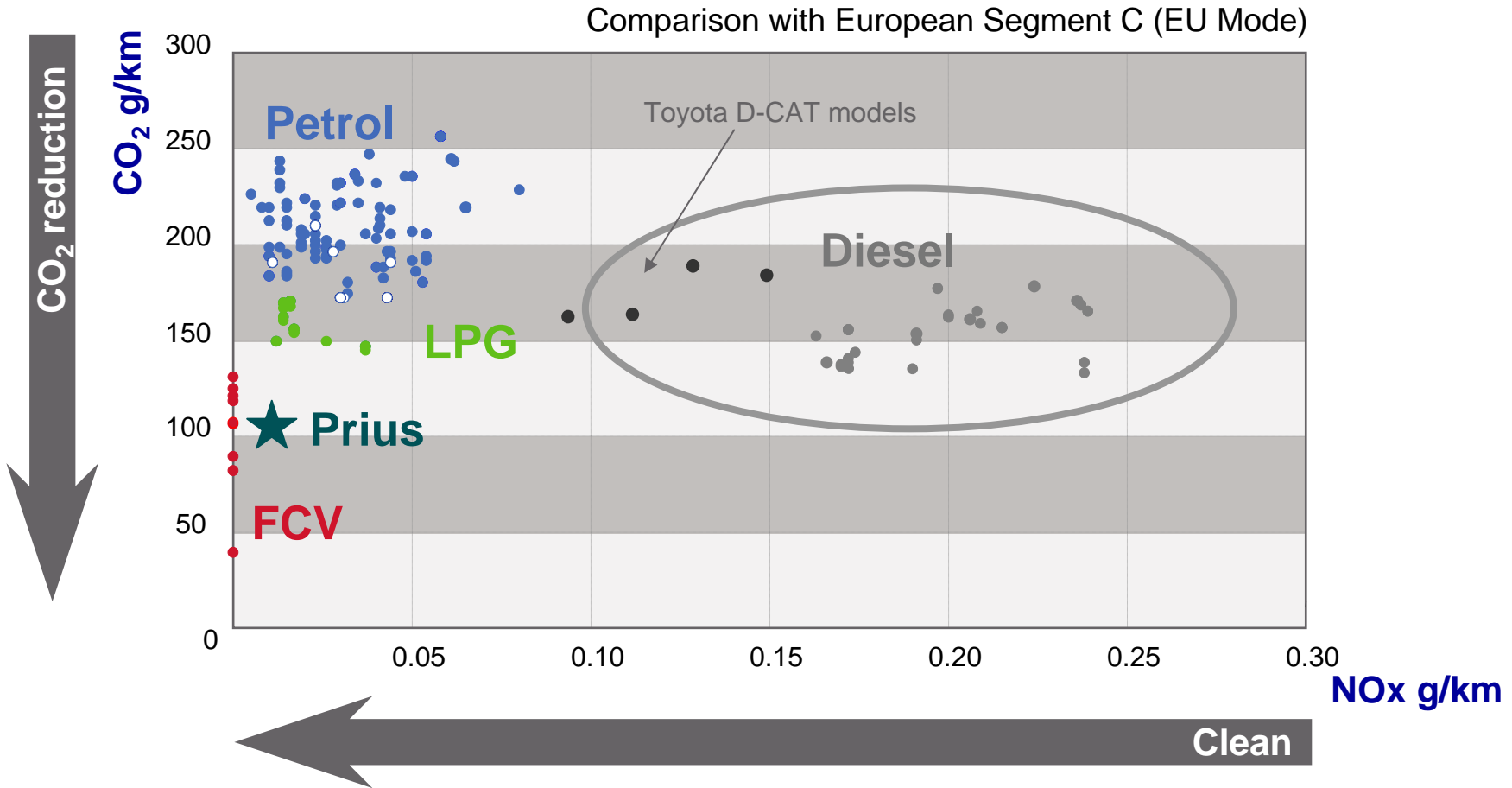
- Extremely low emissions



Source: In house data

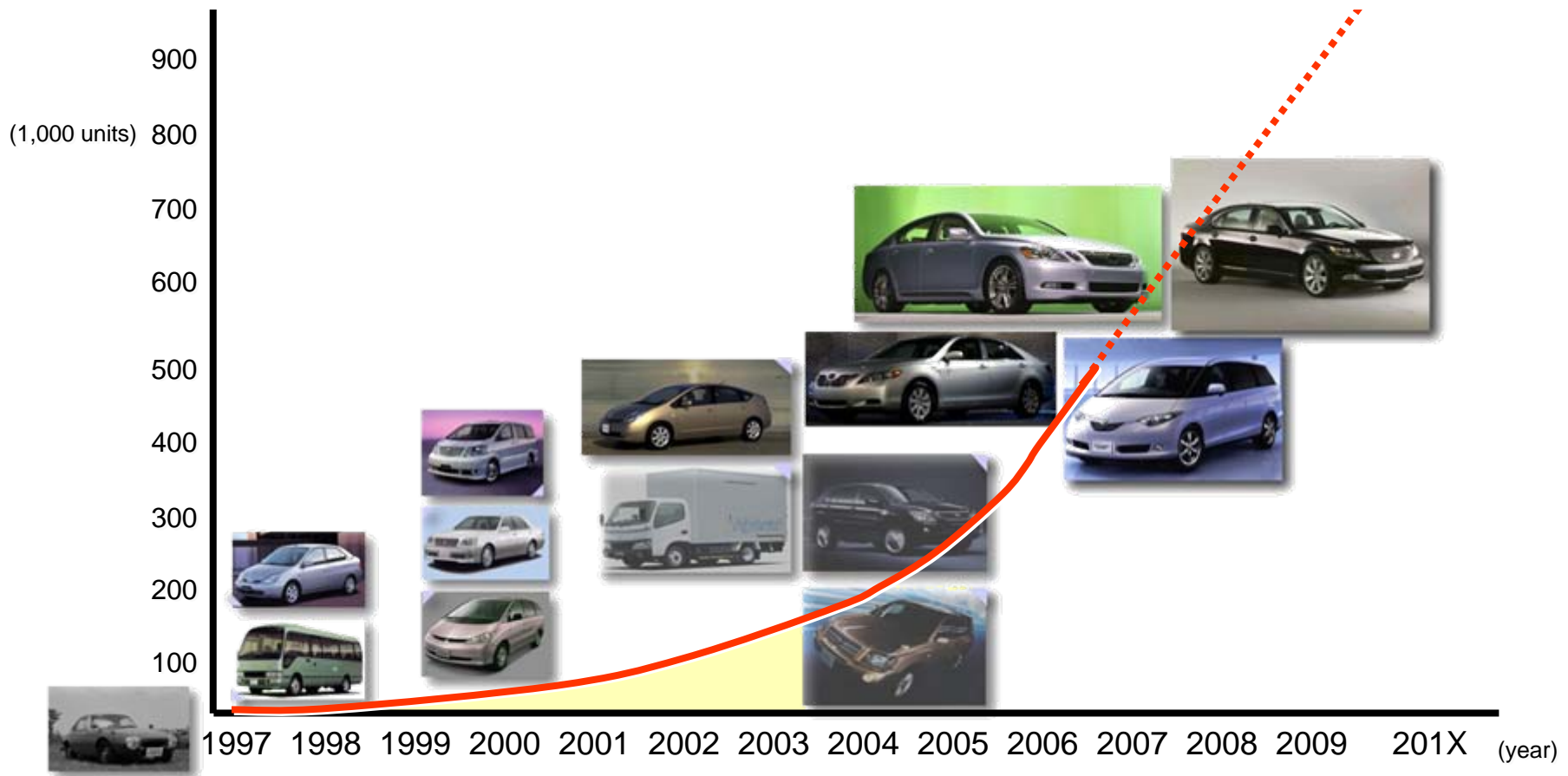
# Hybrid Vehicle

Impressive Environmental Efficiency



# Market Challenges

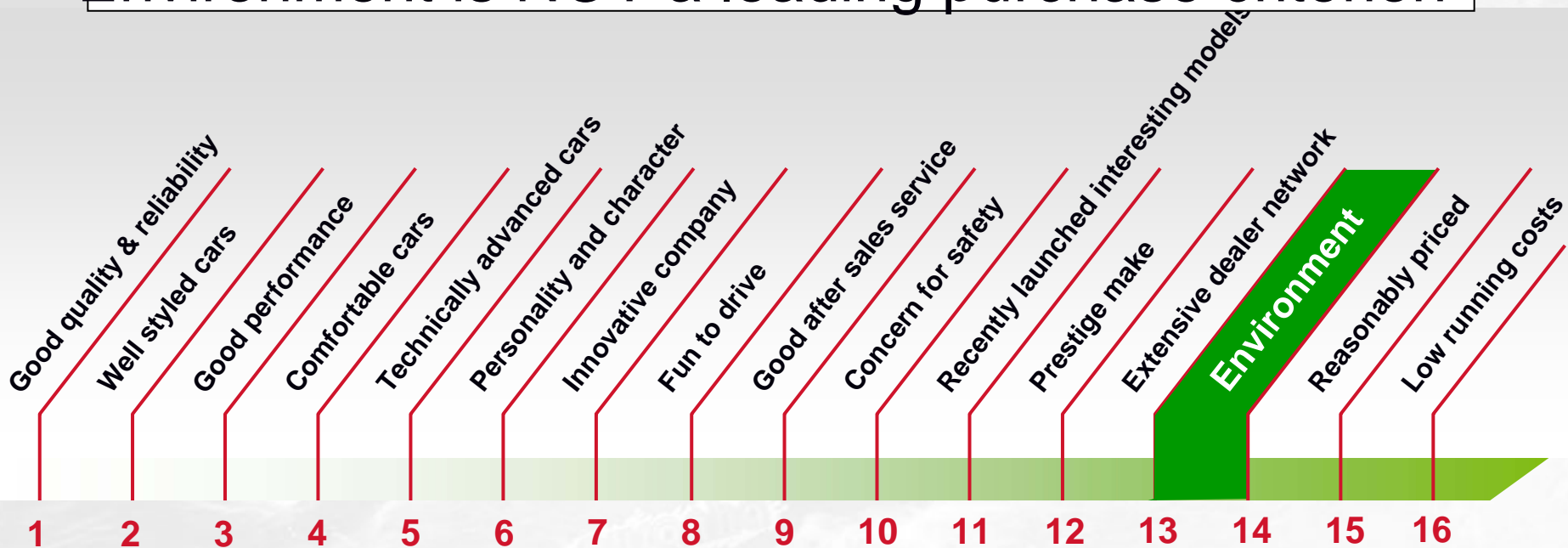
# Yearly Sales of Hybrid Vehicles Worldwide



Aiming to reach one million per year early in the 2010s decade

# Challenges to introduction

Environment is NOT a leading purchase criterion



Source: [Car Park Survey 2002](#)

# Ways to encourage purchase of new technologies

- Technology neutral incentives, e.g.:

## Fiscal

- Reduction on luxury tax, income tax, annual road tax, circulation tax etc.

## Non-fiscal

- Congestion charge exemption
- Free parking in city centres

# Future Outlook:

Plug-in Hybrids

Fuel Cell

# What is a plug-in hybrid?

## 1. Reduce crude oil consumption

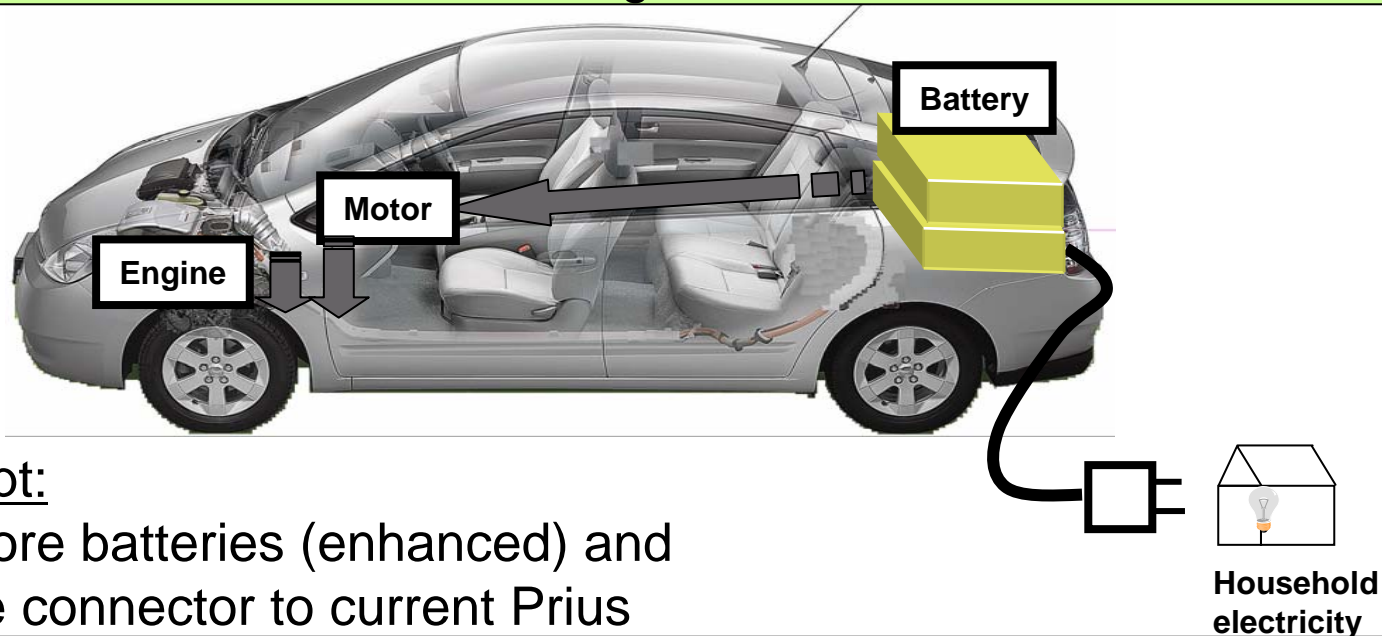
Energy diversity with mixed electricity generation

## 2. Reduce CO<sub>2</sub>

Longer electric drive range reduces Fuel Consumption

## 3. Improve urban air quality

Longer electric drive range enables  
Zero Emission driving in cities



### Concept:

Add more batteries (enhanced) and a cable connector to current Prius

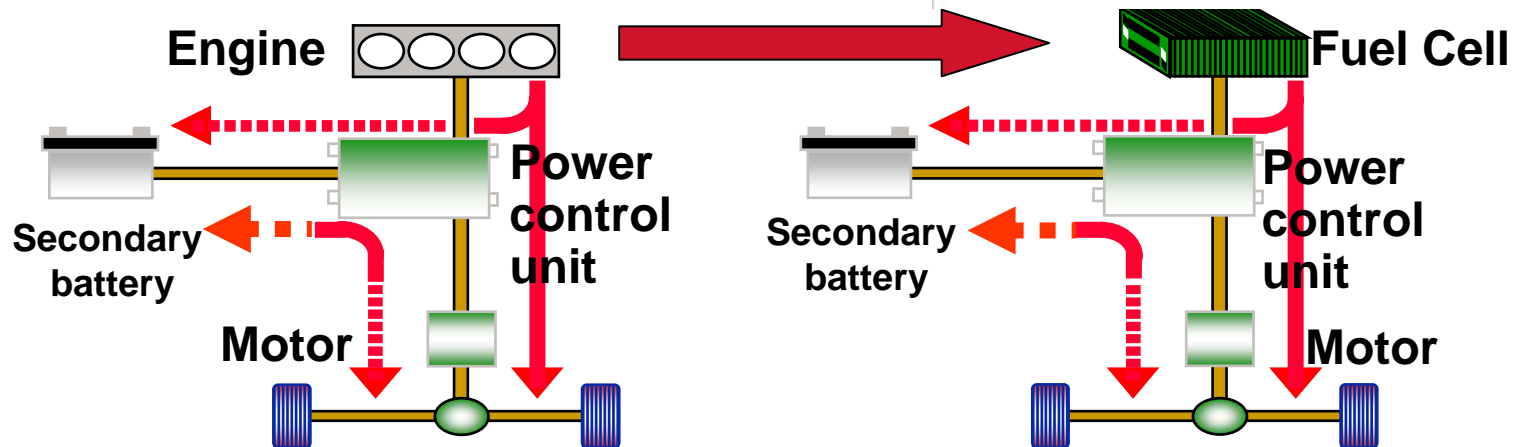


# Toyota's Fuel Cell Technology

Prius



FINE-X



# Conclusion

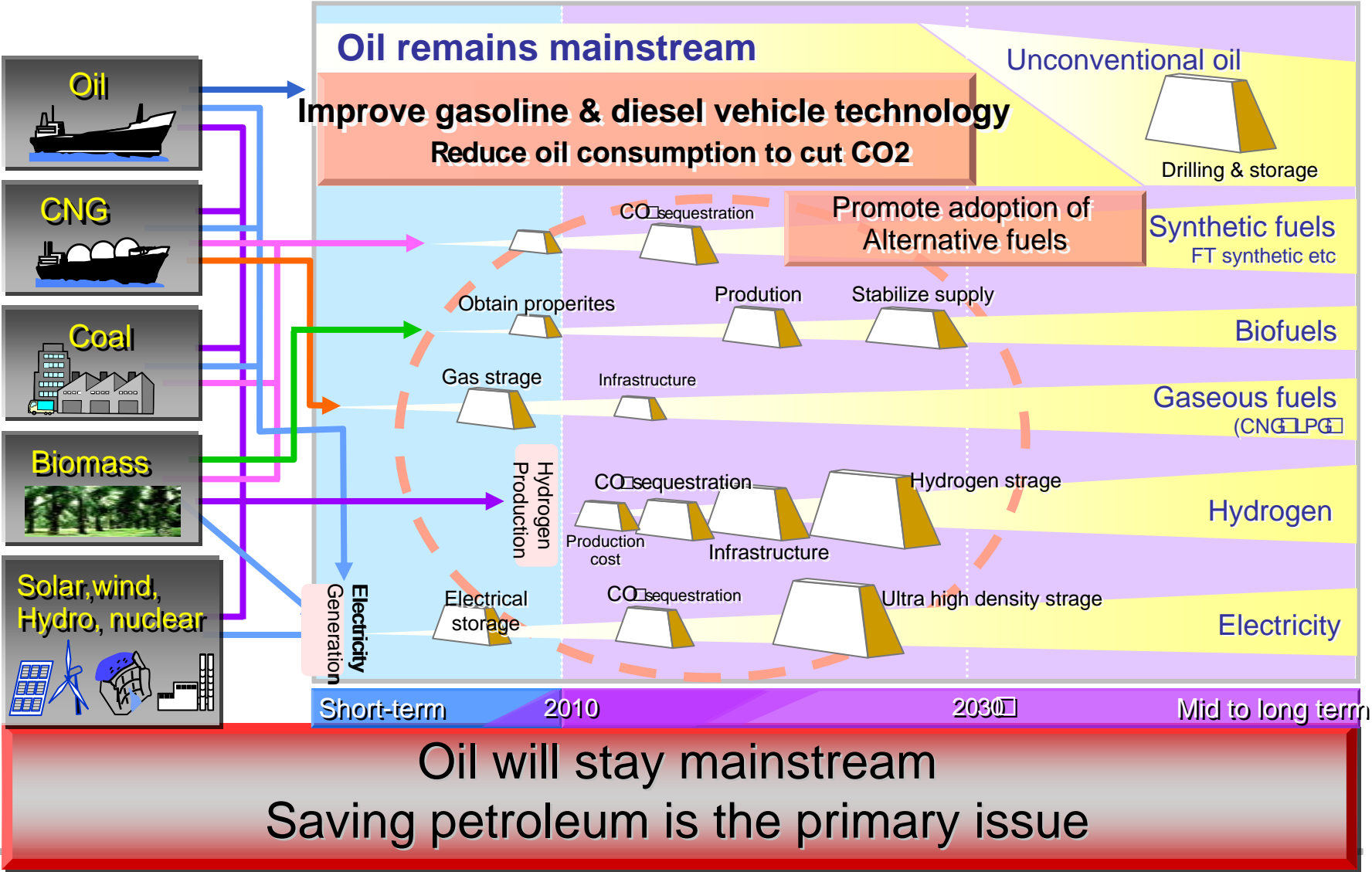
- Hybrid technology offers great potential significantly to reduce CO<sub>2</sub> and exhaust emissions;
- Hybrid technology can be applied to any type of engine, regardless of the fuel used;
- Future developments will further help to reduce CO<sub>2</sub> and enhance energy security.

## **Incentives:**

- **can encourage consumers to consider and purchase new technologies**
- **should be technology neutral**

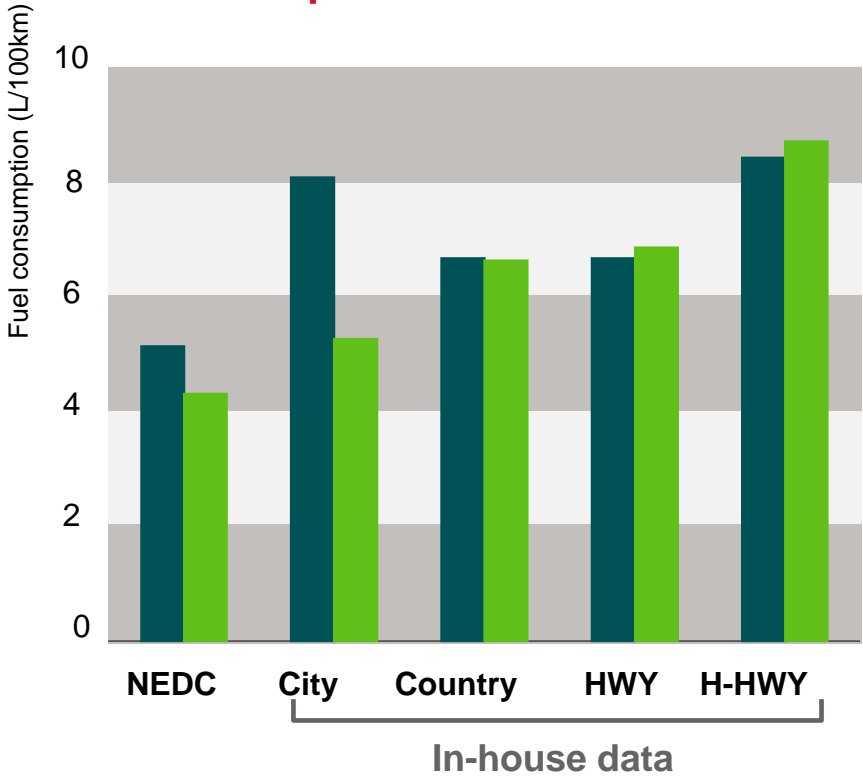
# Back-up

# Automotive Fuel Diversification Scenario

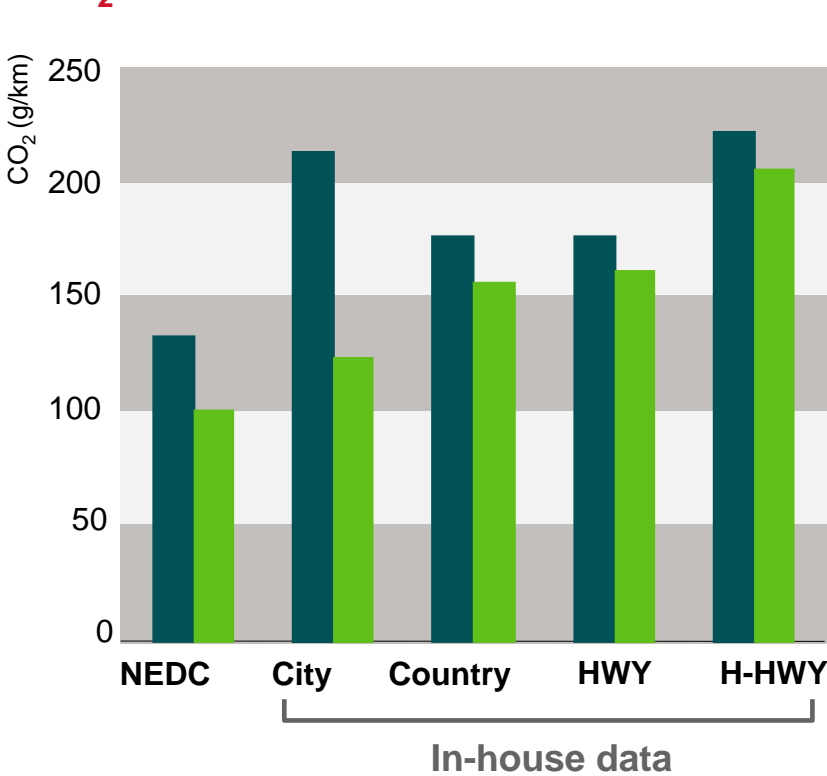


# Fuel Consumption and CO<sub>2</sub>

## Fuel Consumption

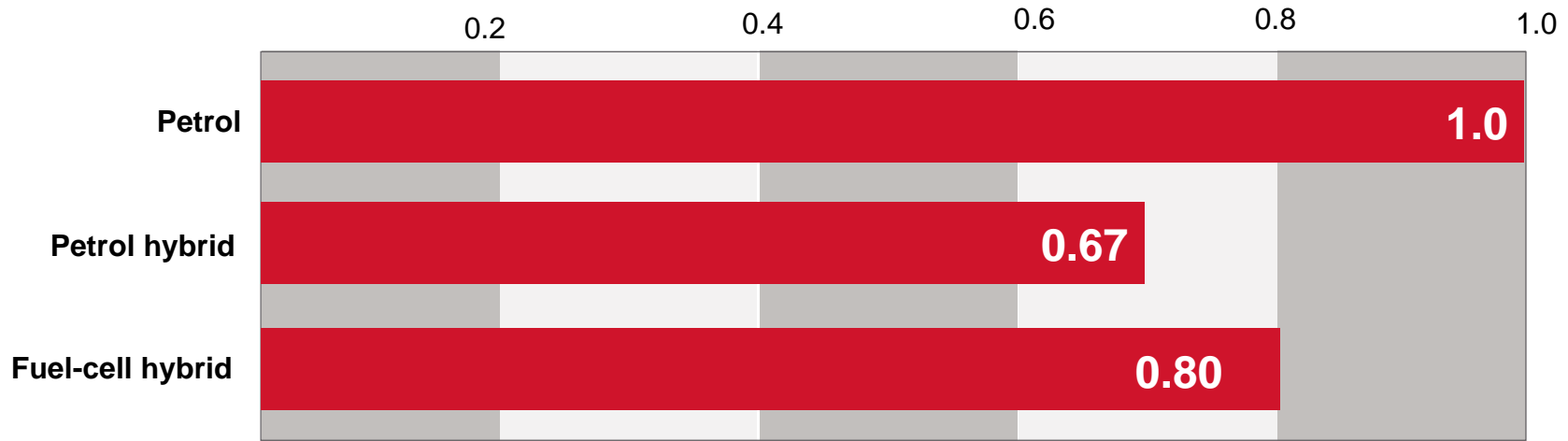


## CO<sub>2</sub>

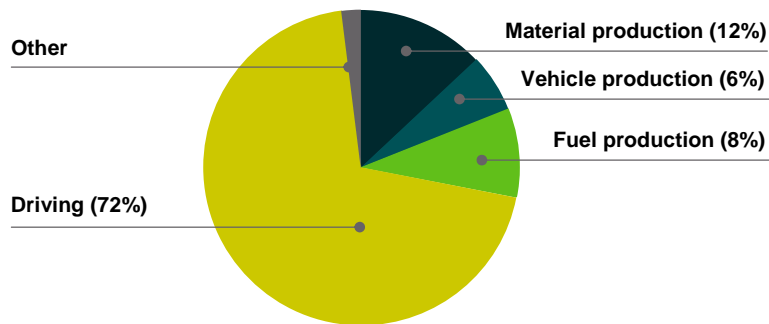


■ Diesel MT (Euro-3)
 ■ Prius

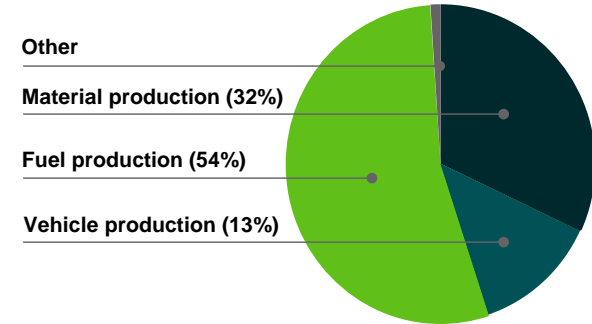
# CO<sub>2</sub> output over the Vehicle Life Cycle



## Petrol vehicles



## Fuel-cell Hybrid vehicles



# Toyota's hybrid vehicle sales

(as of December 2006)

	2006 (Jan-Dec)		Total
<b>Prius</b>	<b>Total</b>	<b>186.000</b>	<b>639.000</b>
	Japan	49.000	232.000
	Overseas	137.000	407.000
	N. America	109.000	342.000
	Europe	23.000	54.000
	Others	5.000	11.000
<b>RX400h Harrier</b>	<b>Total</b>	<b>38.000</b>	<b>69.000</b>
	Japan	5.000	10.000
	Overseas	33.000	59.000
	N. America	21.000	42.000
	Europe	11.000	16.000
	Others	500	600

# Toyota's Fuel Cell Technologies

Started developing fuel cell technologies in 1992

## Toyota FCHV



**Fuel:** Hydrogen (High-pressure)  
**Range:** 330 km  
**Maximum Speed:** 155 km/h

## MOVE FCV-K-2



**Fuel:** Hydrogen (High-pressure)

## Toyota FC stack



## FCHV-BUS



**Fuel:** Hydrogen High-pressure  
**Capacity:** 65 people  
**Maximum Speed:** 80 km/h

## Household FC Cogeneration system



**Fuel:** Natural gas, **Output:** 1 kW