

# Sustainable mobility & Low carbon strategy



**Philippe SCHULZ**

**Strategic Environmental Planning – Senior Manager**

# THREE MAJOR ENVIRONMENTAL CHALLENGES



URBAN AIR POLLUTION

Regulations  
(Euro 5,6...)



New technologies  
(Particulate Filter, NOx Trap), Car affordability



GLOBAL WARMING

CO<sub>2</sub> Taxes & Incentives  
(on Fuels and Cars)



Car price  
Use costs  
Sales mix changes



RESOURCES DEPLETION

Material prices  
Fuel shortage



Profitability  
Car residual value  
New Fuel solutions

IMPACTING THE BUSINESS :

THREE OPPORTUNITIES

ENVIRONMENT & HEALTH

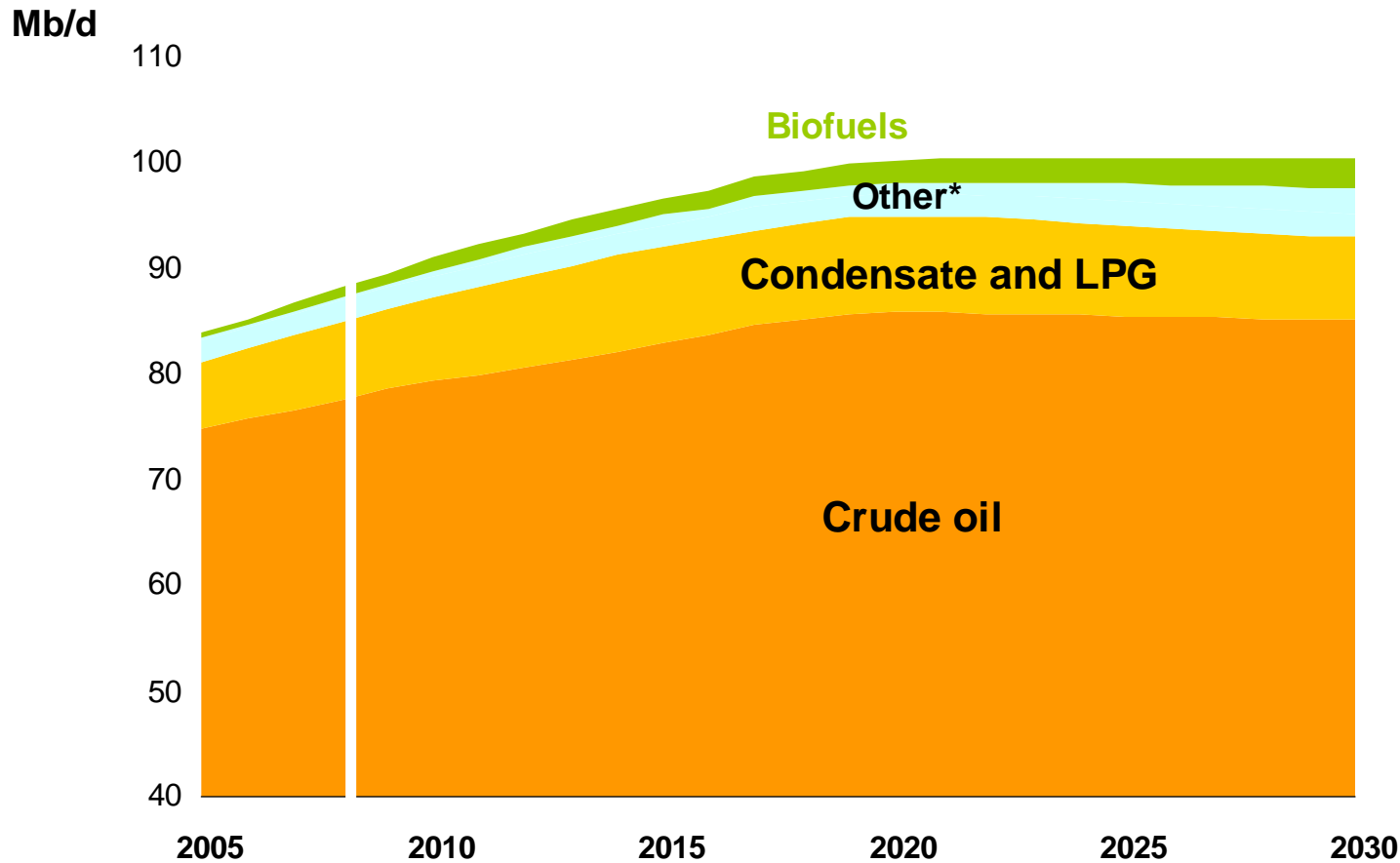
TOP 3 CO<sub>2</sub>

LIFE CYCLE ...UP TO RECYCLING

# Energy Challenge 1 : Oil & liquid fuel supply will reach a plateau in the next 5 -10 years

*Example: Total scenario (June 2008)*

**The world will have to adapt rapidly to a constrained energy supply**

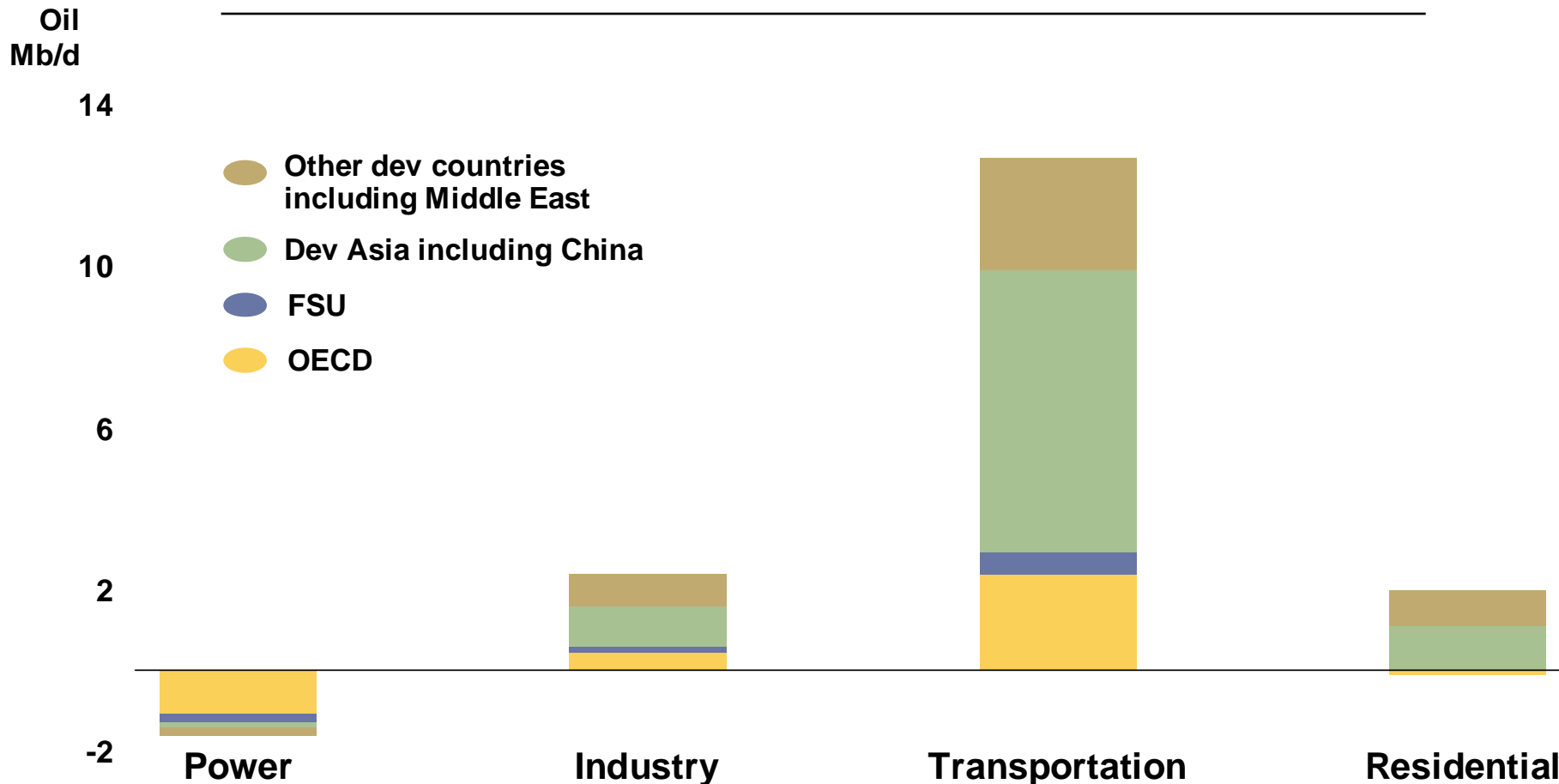


\* Other: GTL + CTL and refining gains.



# Energy challenge 2: Transportation is the main driver of oil demand increase, particularly in developing countries

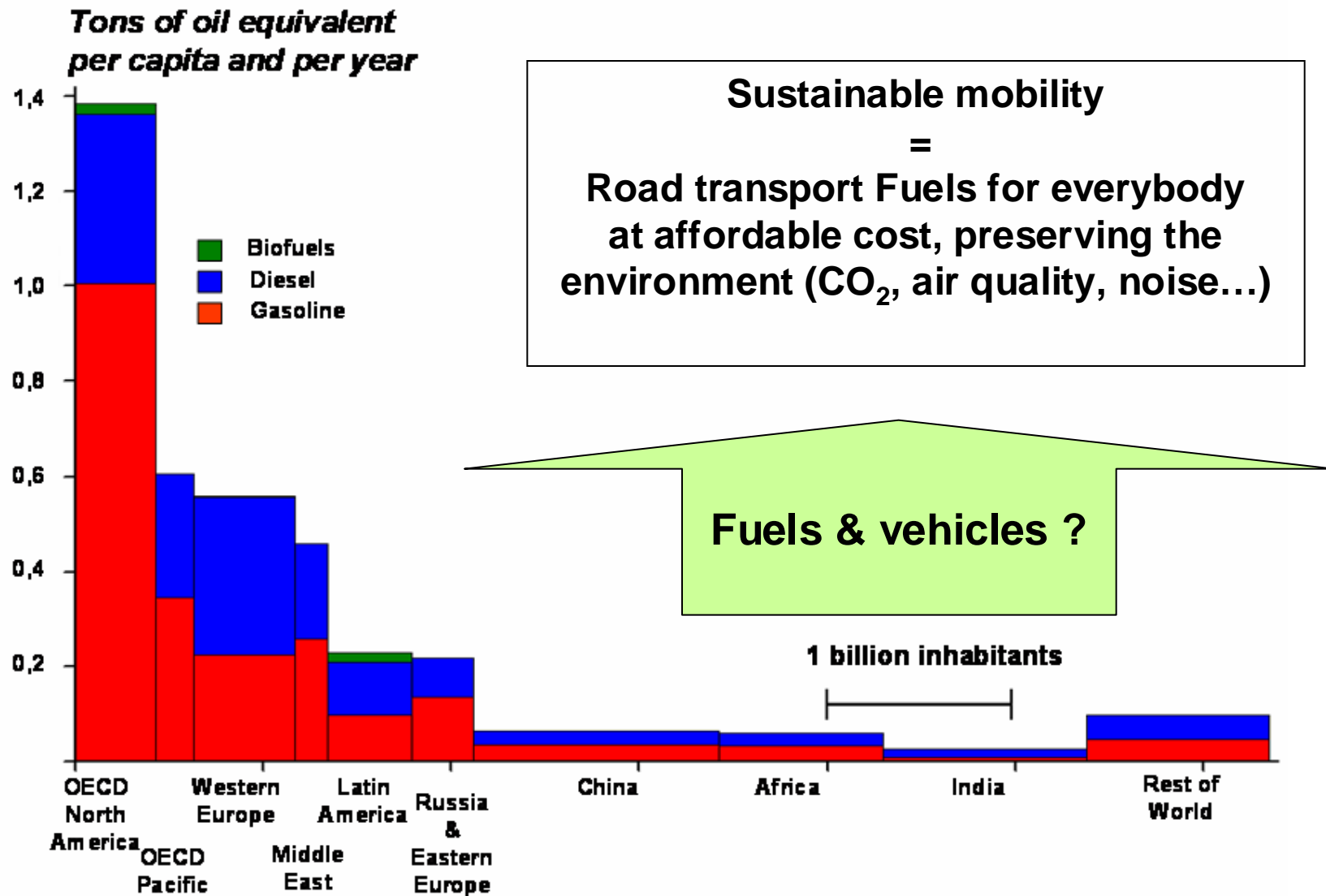
Incremental world oil demand by region and sector 2005-2030



Source : IEA World Energy Outlook, Total

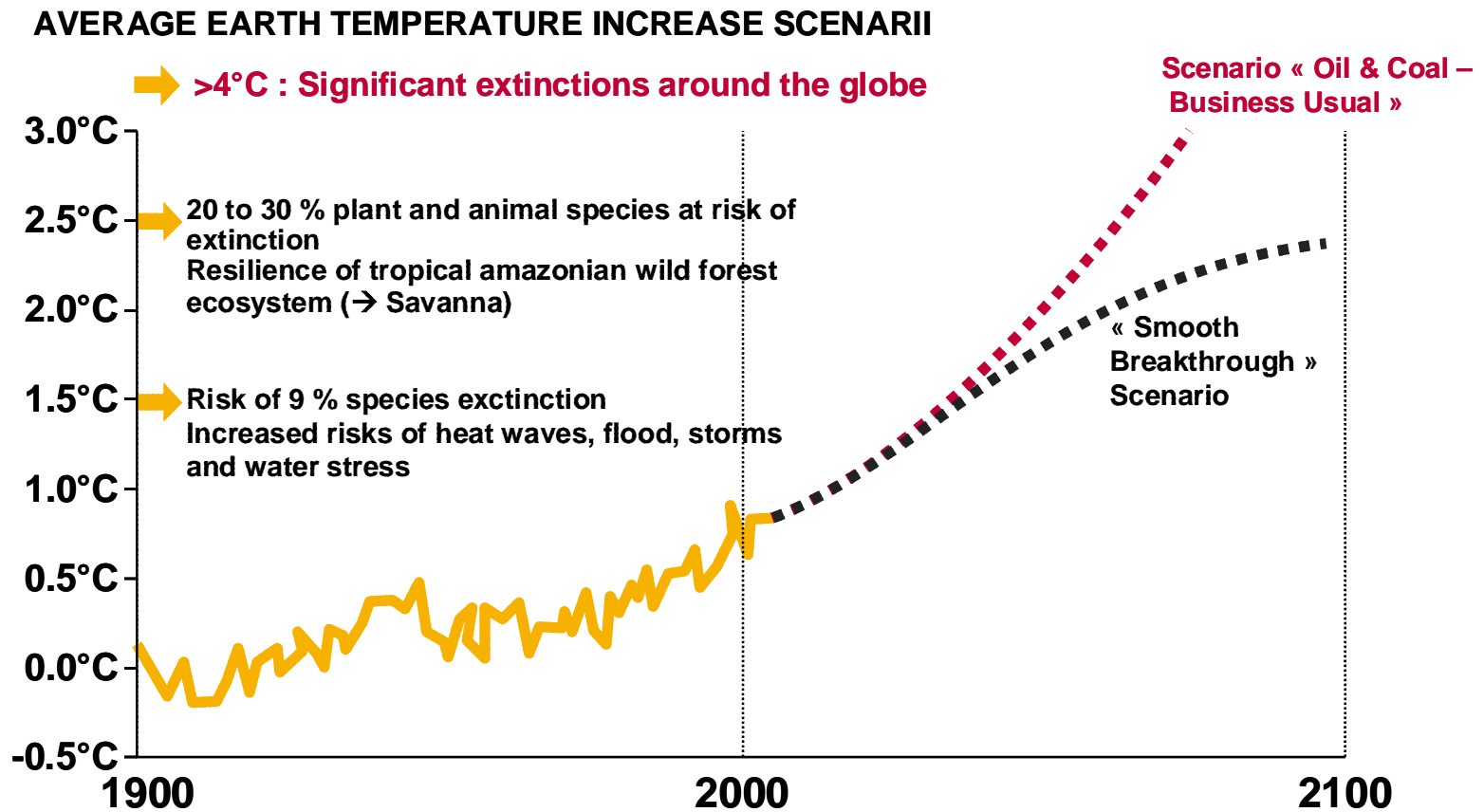


# Energy Challenge 3: Huge needs in road transportation fuels in emerging countries



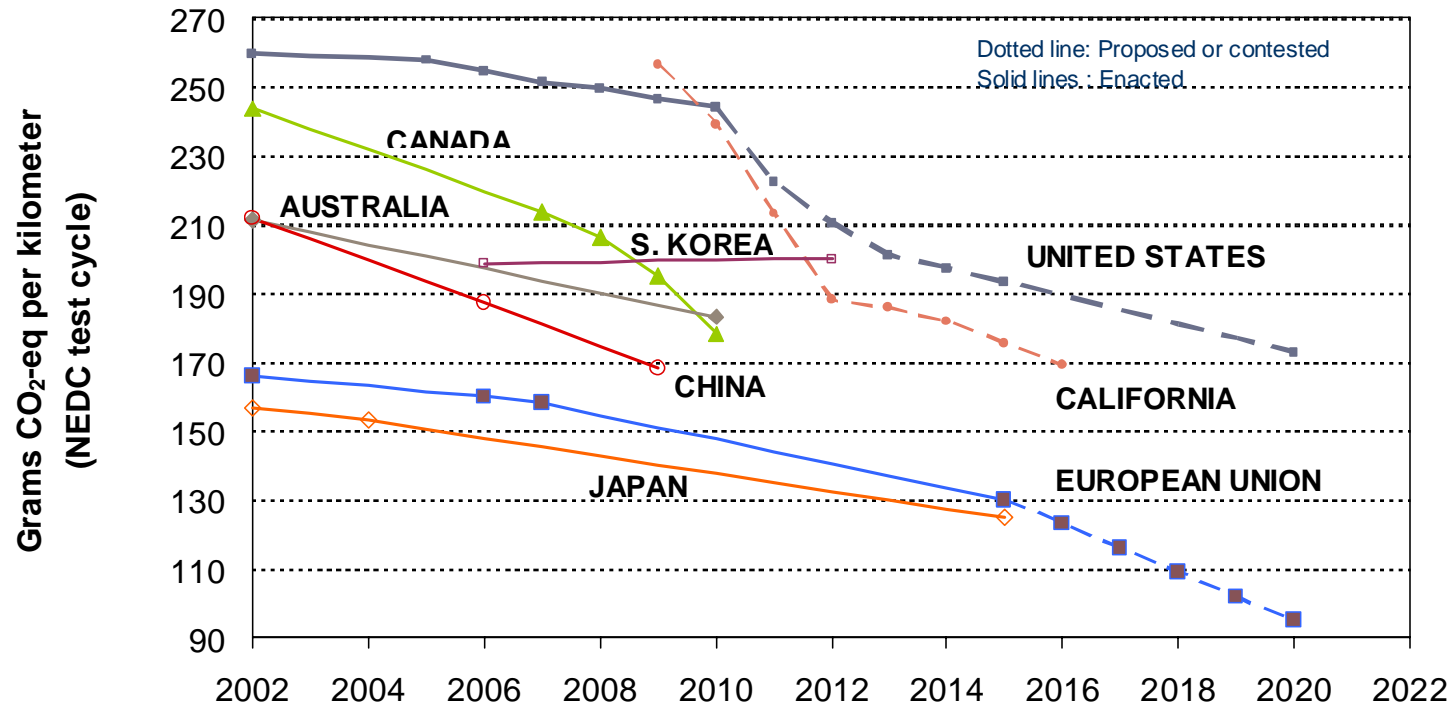
# CO<sub>2</sub> Challenge: Address it now !

*IPCC Report, 2007*



# Cars and anthropogenic CO<sub>2</sub> emissions

- Personal cars are responsible of about 12 % of the European CO<sub>2</sub> emissions
- Europe takes the lead of car CO<sub>2</sub> emission reduction (confirmed by Dec 19, 2007 Proposal of EU Commission)
- But the issue is global



Source: *Passenger Vehicle Greenhouse Gas and Fuel Economy Standards: A Global Update*, ICCT. 7 August 2008 update.

# Global Impact on for the planet means affordable environmental cars

## Fuel consumption



Energie	Personenauto
Fabrikant Model	RENAULT Skaneva 1.5 (2 deurs) 1.5 (10)
Brandstof	Diesel
Brandstofverbruik	4,6 liter / 100 km = 1 liter op 21,7 km
Zuinig	A
Onzuinig	
CO <sub>2</sub> -uitstoot	120 gram / km

## CO<sub>2</sub> national taxations

Each gram of saved CO<sub>2</sub> per km has a customer value

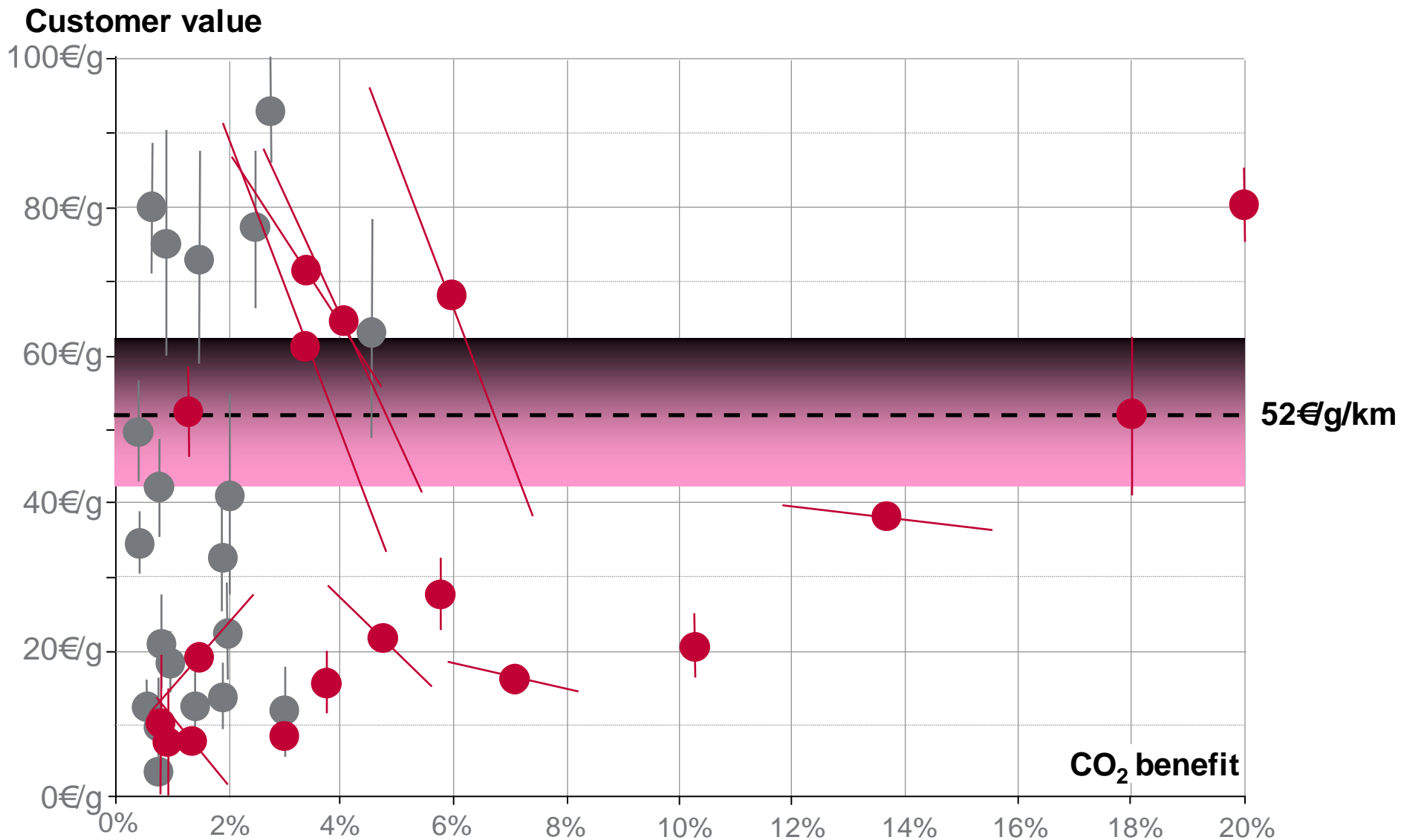
1g CO<sub>2</sub>/km  
0,04 l/100 km

Renault EU  
average  
customer value:  
52 € / g/km



# CO<sub>2</sub> Technologies

- Vehicle management
- Powertrain technologies



# FOSTERING THE PROGRESS FROM GENERATION TO GENERATION

## DIESEL ENGINES :



## GASOLINE ENGINES :



# Downsizing....

*Diesel engine*



**1.5 dCi**

*Gasoline engines*



**1.2 TCE 100**



**1.4 TCE 130**

**Forthcoming turbocharged & direct injection gasoline engines range :**

3 cylinders  
0,9 l  
90 hp



4 cylinders  
1,2 l 115 hp

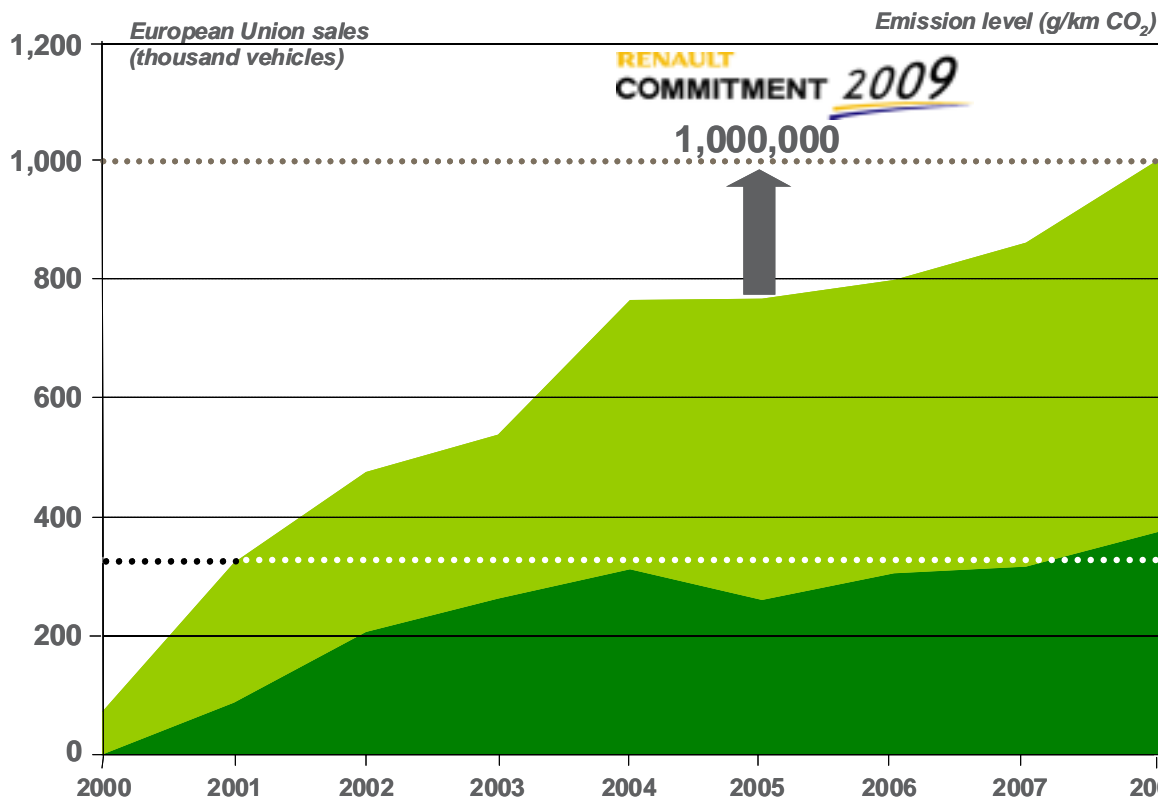




# Renault - The first OEM with a public commitment on **volumes** of low CO<sub>2</sub> vehicles on market !

Renault commitment 2009, taken in Feb.2006:

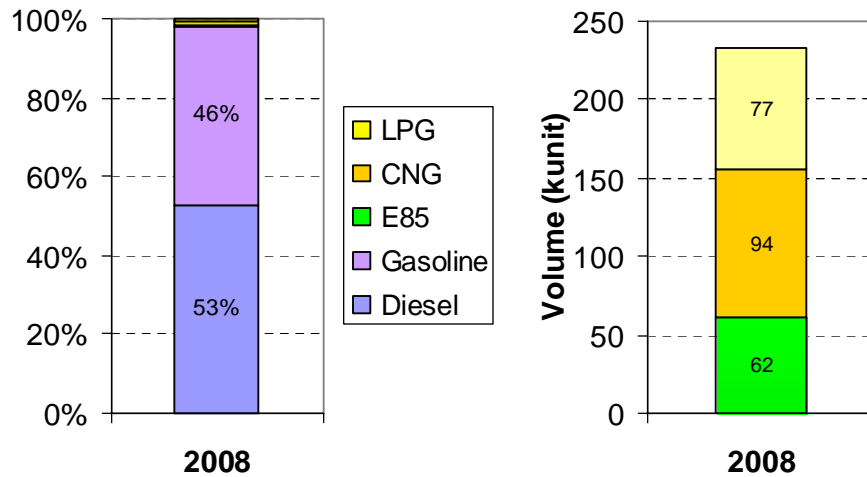
**1 million cars** below **140 g/km** with one-third below **120 g/km**



2008 results (despite crisis !)  
923 000 cars < 140 g/km  
364 000 cars < 120 g/km

# European sales of alternative fuel vehicles

## OEM sales in Europe



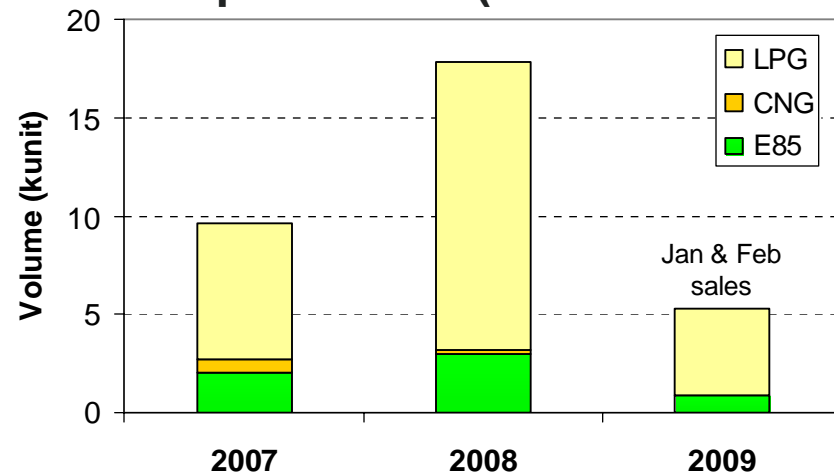
Still very small market shares:

- E85 0.5%
- CNG 0.7%
- LPG 0.6% (w/o retrofit conversion)

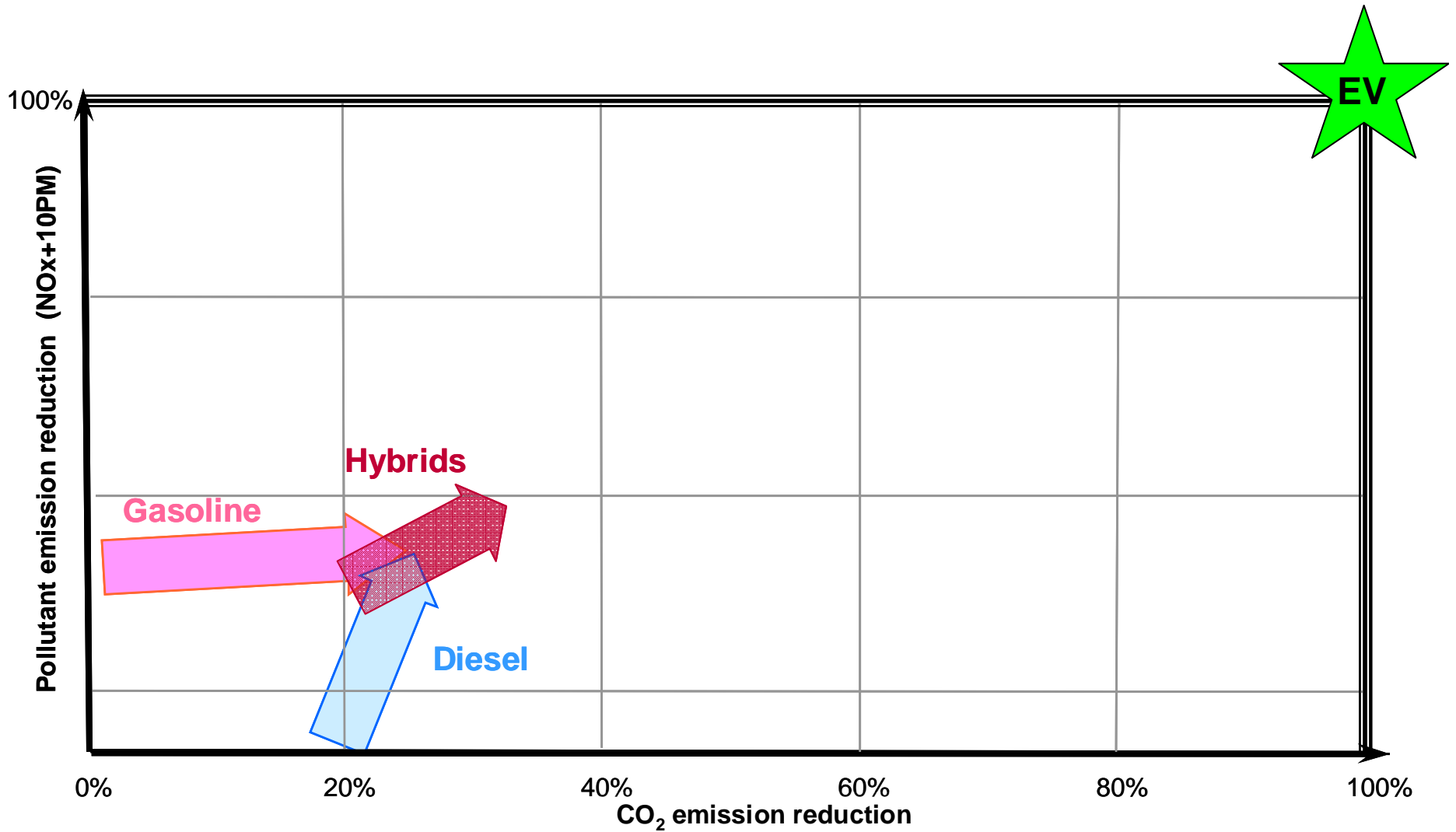
But rapidly growing (X4 since 2004)



## European sales (Renault & Dacia)



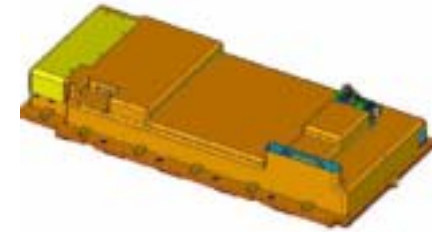
# Electric Vehicle as the ultimate Zero Emission Vehicle in use



# Electric Vehicles : Three main reasons for a massive deployment during the next decade

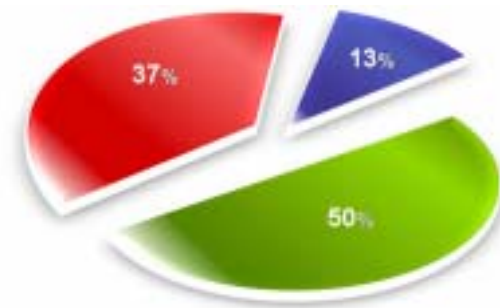
## ■ 1. Technology & Cost

- *Advanced Li-ion batteries*
- *High volumes production*



## ■ 2. Sociology & Market

- *EV driving range (>> 100 km)*
- *> 50 % of world population in cities (2006)*
- *Suburban drivers: 87 % less than 60 km/day !*



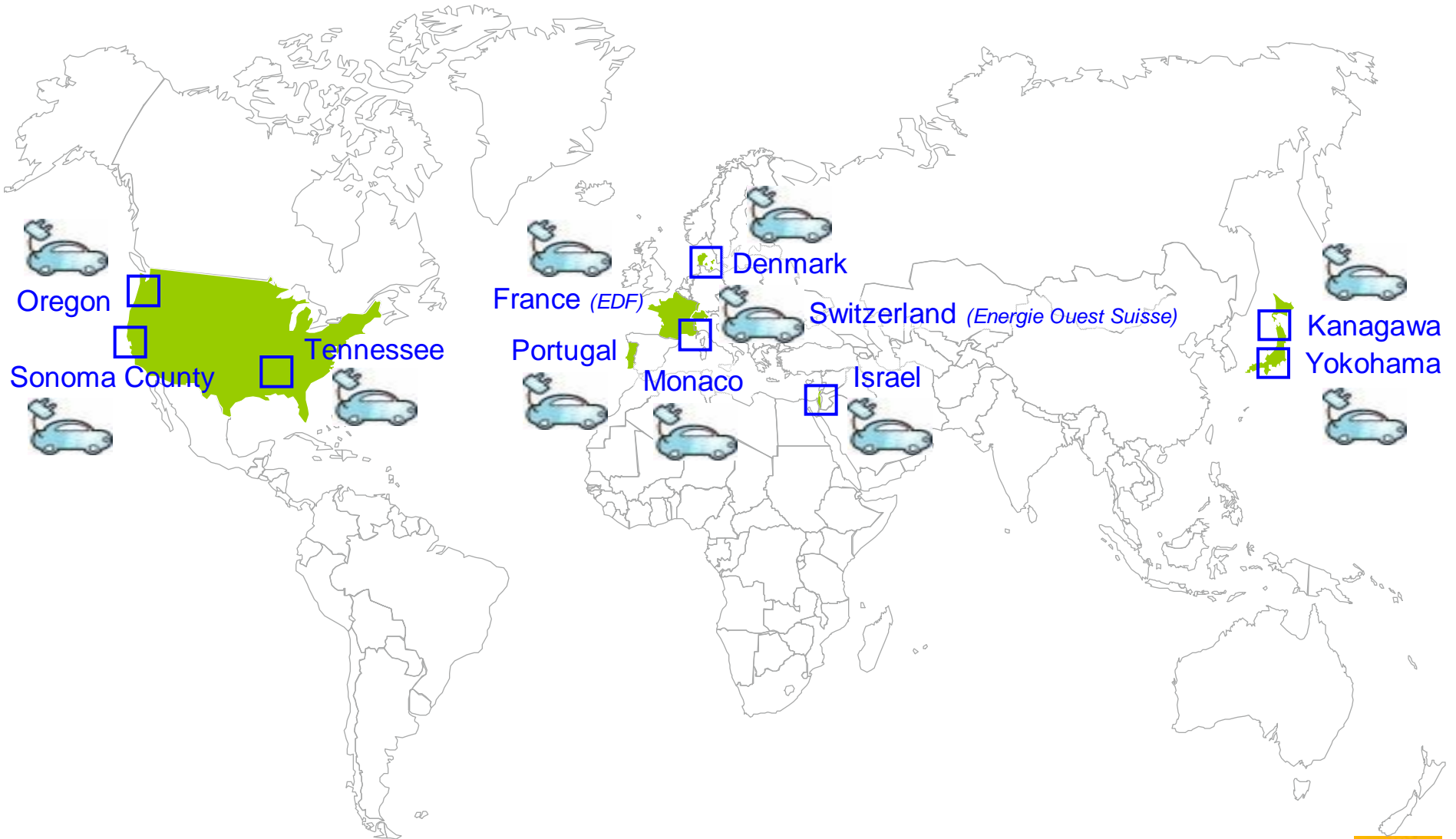
## ■ 3. Regulations & Incentives

- *Car ban or restriction in cities*
- *CO<sub>2</sub> taxes on cars*











# ZERO EMISSION 11 PARTNERSHIP AGREEMENTS SIGNED



# A complete Renault Electrical Vehicle Line-up

	2009	2010	2011	2012
 e Sedan (Israel)				
 e LCV (Fleets)				
 e specific				

 Mass production

# Sustainable mobility = affordable and ecological vehicles

*Launched in May 2007 ...*



*Launched in October 2008 ...*



# Three Renault eco<sup>2</sup> criteria

*Measurable and verifiable*



**Plants**

**ISO 14001 Plants**



**Use**

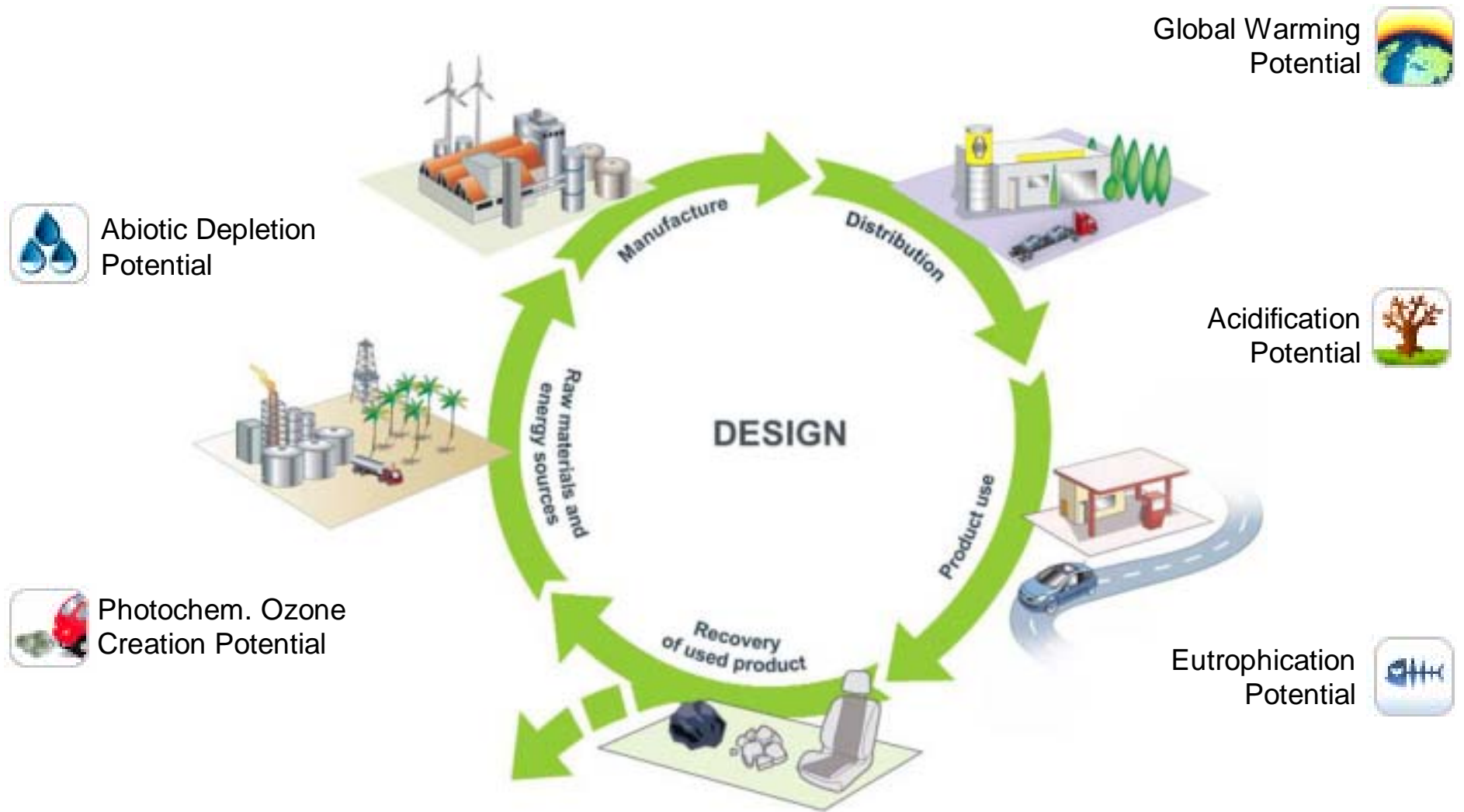
**< 140 g CO<sub>2</sub> /km  
Or Biofuels**



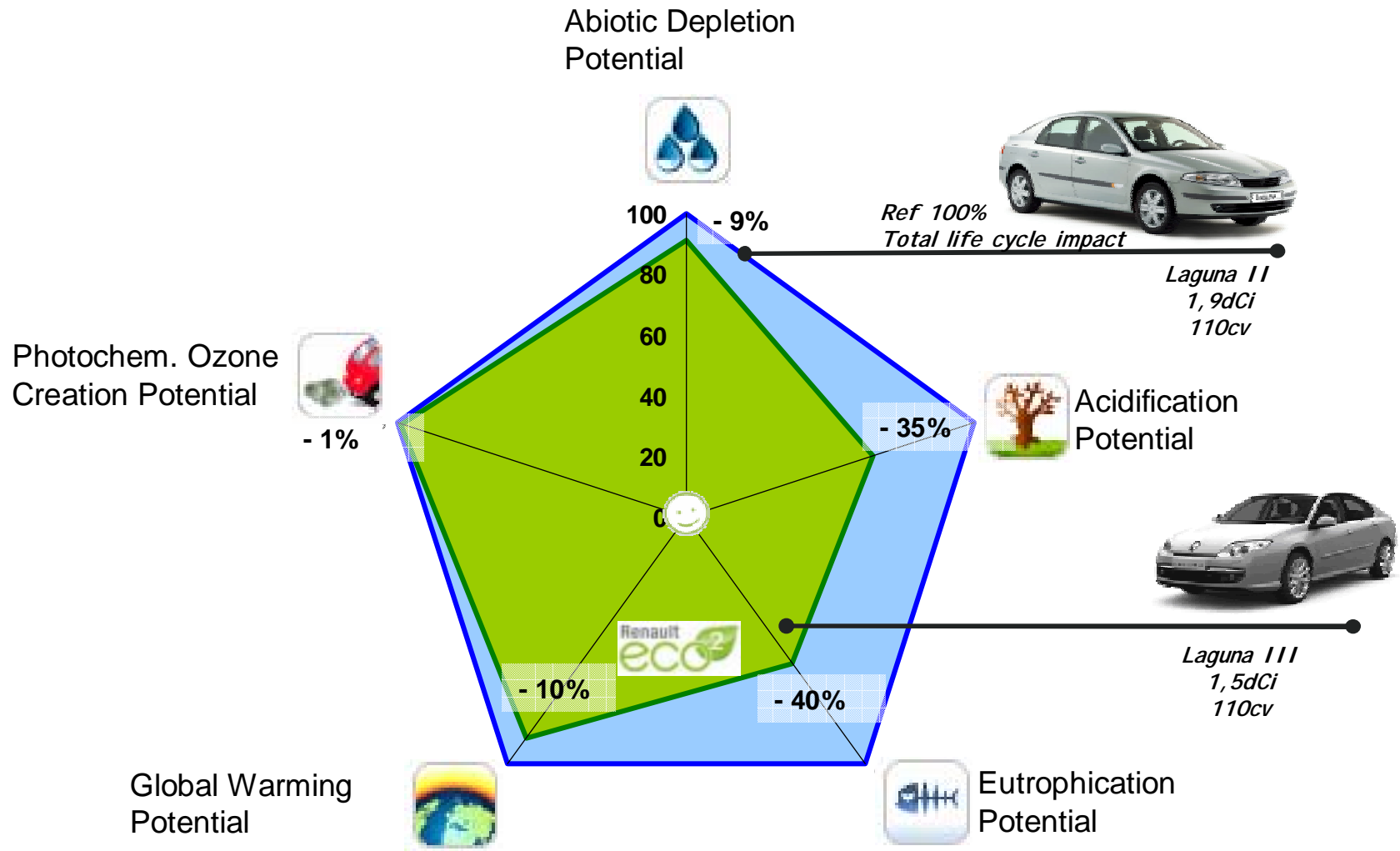
**End of Life**

**95% valorizable &  
5% of recycled plastics**

# Assessment of Multiple impacts over Life Cycle



# On each new vehicle, true reduction of the footprint requires progress for all individual impacts



# Environment in the heart of Renault's strategy

1

Vehicles



2

Powertrains



3

Technology



4

Environment

