

Reducing CO2 Emissions from Road Transport

Institute Electrical Engineers

Conference on Automotive Electronics

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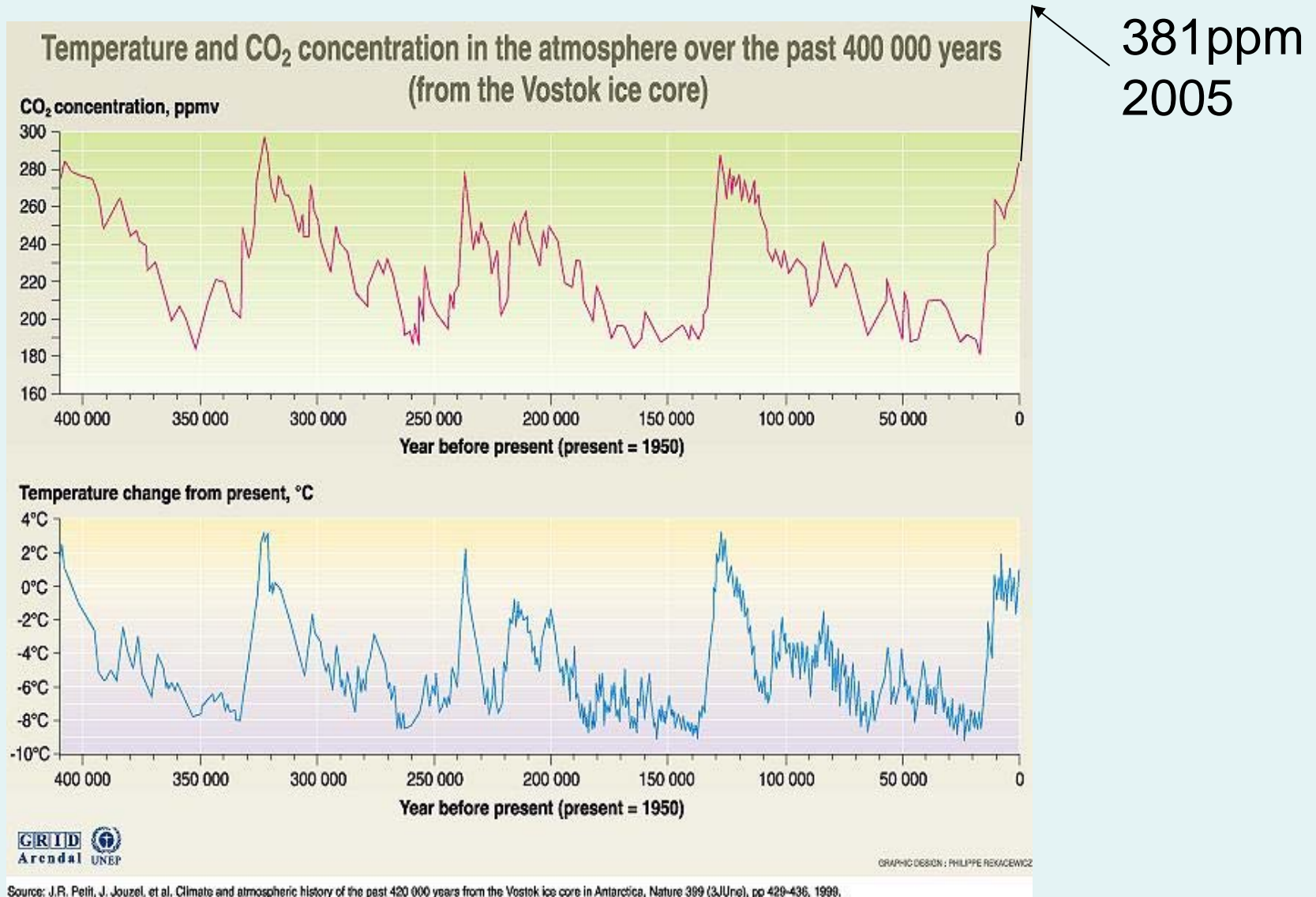
Low Carbon Vehicle Partnership

Accelerating a sustainable shift to low carbon vehicles and fuels in the UK

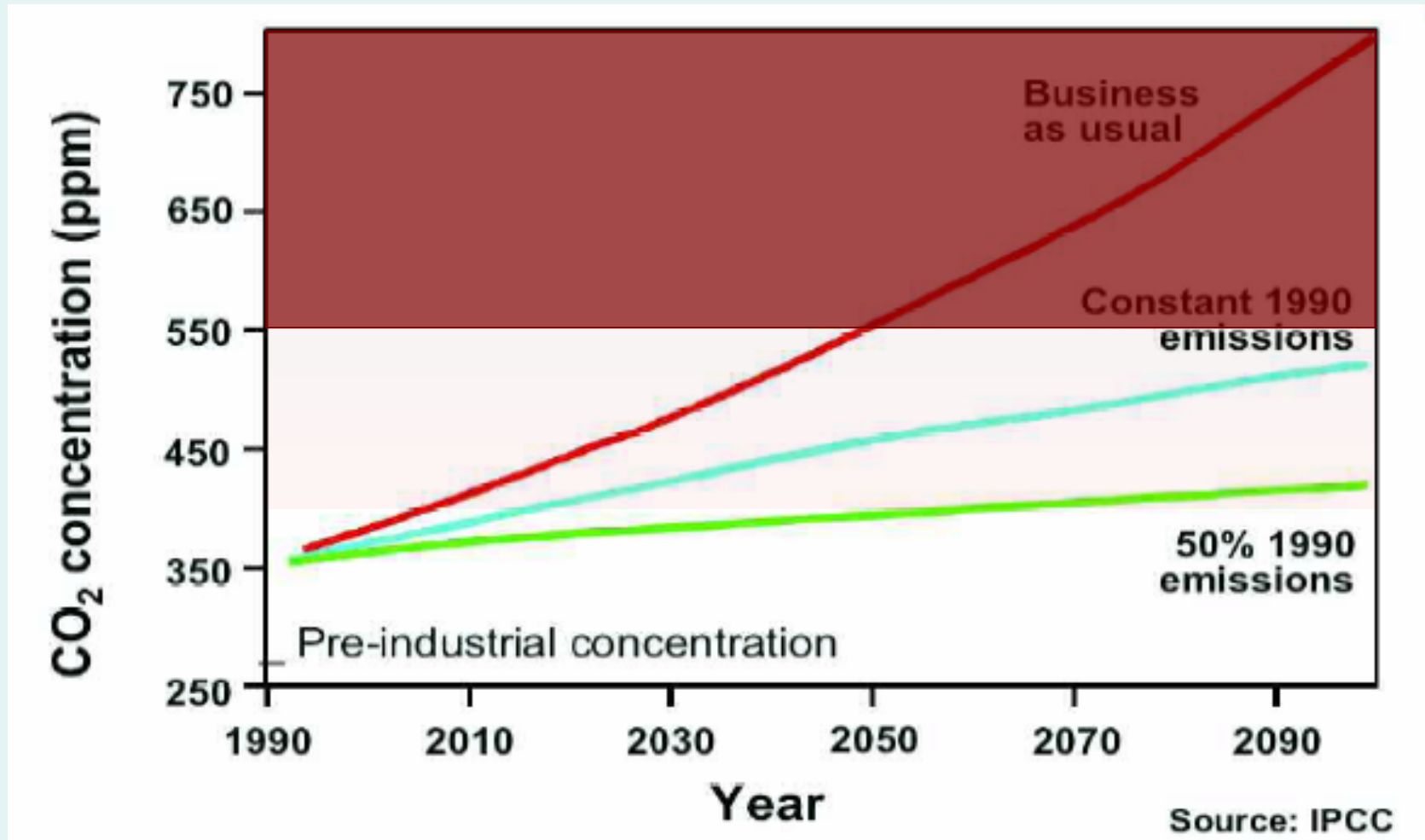
Stimulating opportunities for UK businesses



Trends in Atmospheric CO₂ levels for past 400k yrs



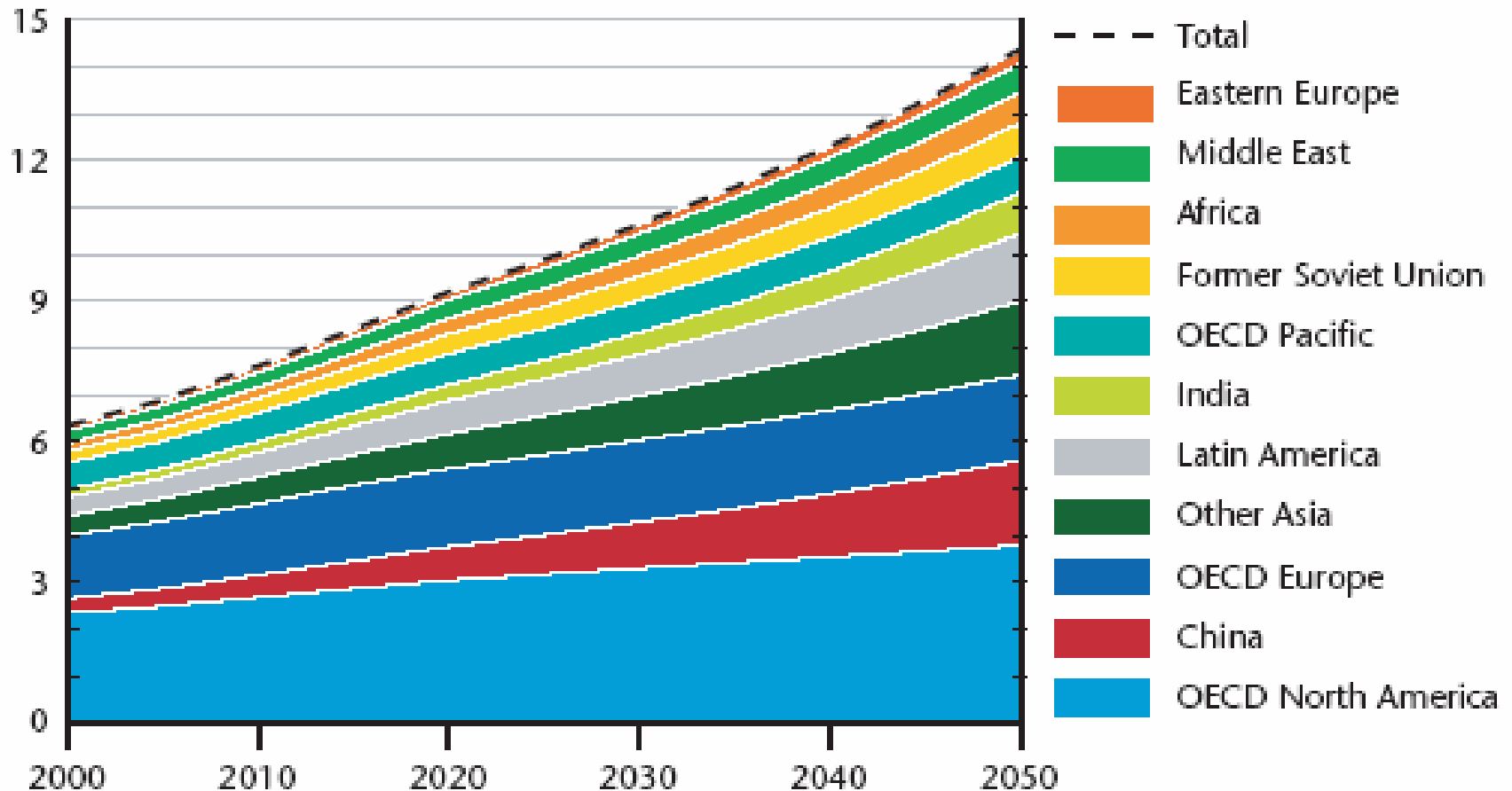
The risk of “dangerous climate change” increases as CO₂ concentrations stabilise above 400ppm. At 550ppm there is considerable risk of significant harm



The scale of the challenge

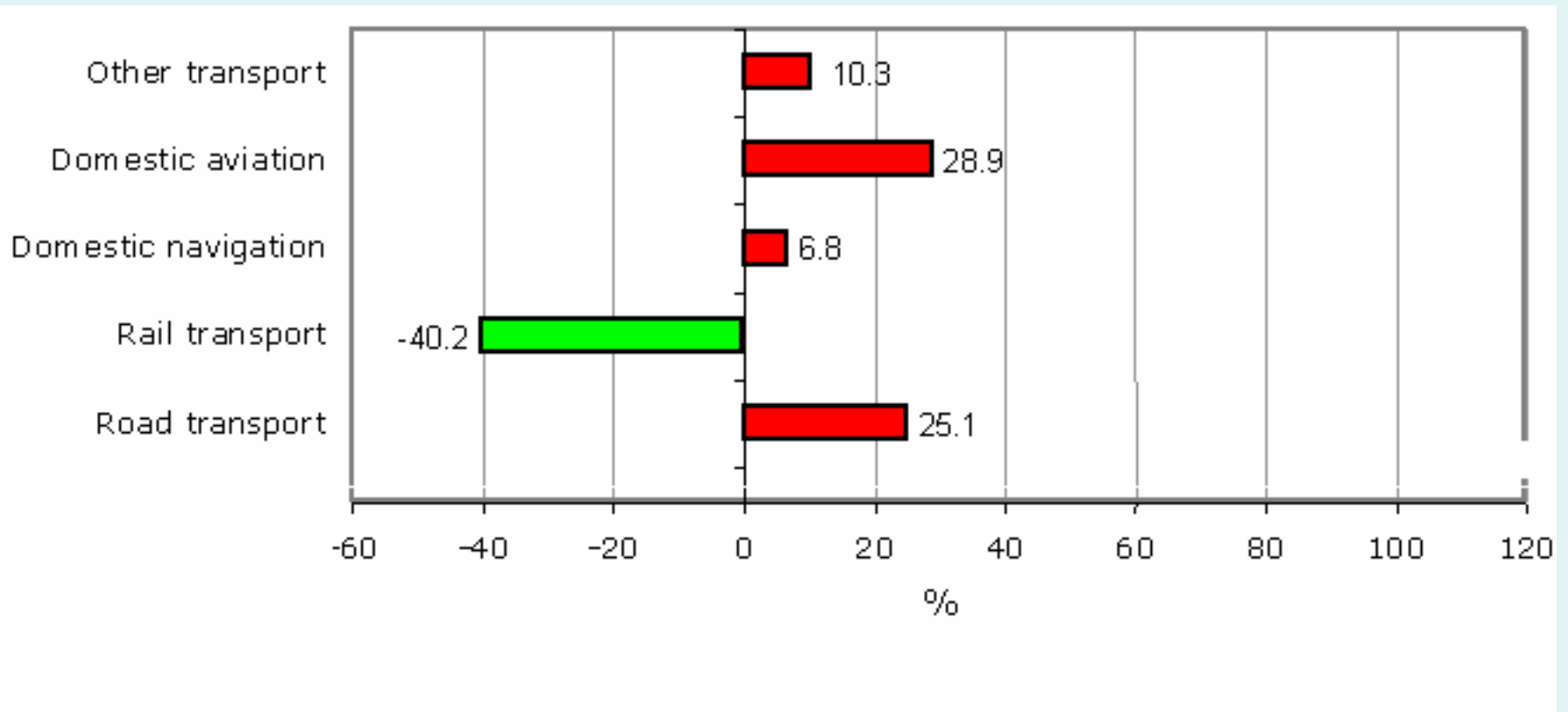
Forecast growth in greenhouse gas emissions from transport

Gigatonnes CO₂-Equivalent GHG
Emissions/Year



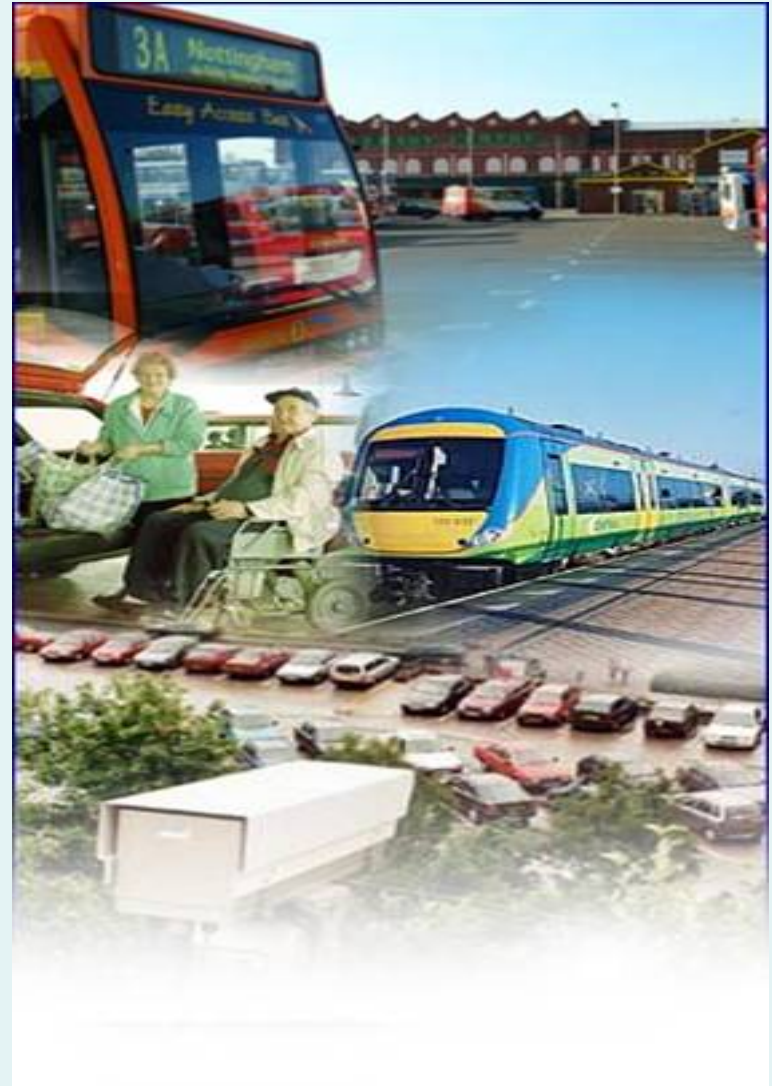
The scale of the challenge

Change in EU15 GHG transport emissions 1990 – 2003

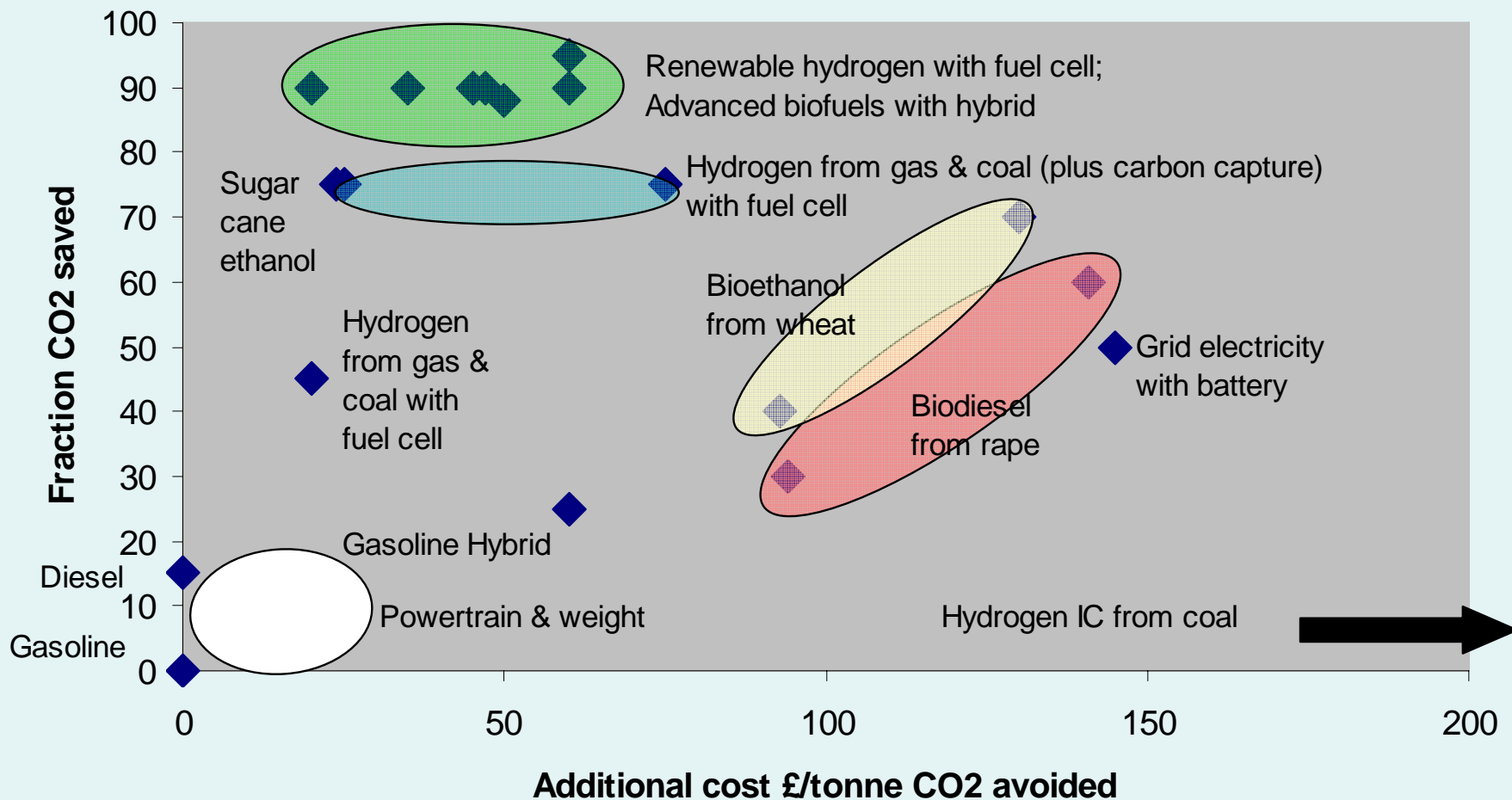


Reducing road transport emissions will require a combination of measures

- Improved vehicle efficiency
- Low carbon / alternative fuels
- Improved driver behaviour
- Reduced vehicle use
- Better freight distribution
- Modal shift
- Land-use planning
- Tele-working



Wide range of CO2 savings & cost-effectiveness for alternative fuels and vehicle technology



Well to Wheel GHG savings & production costs for biofuels vary widely

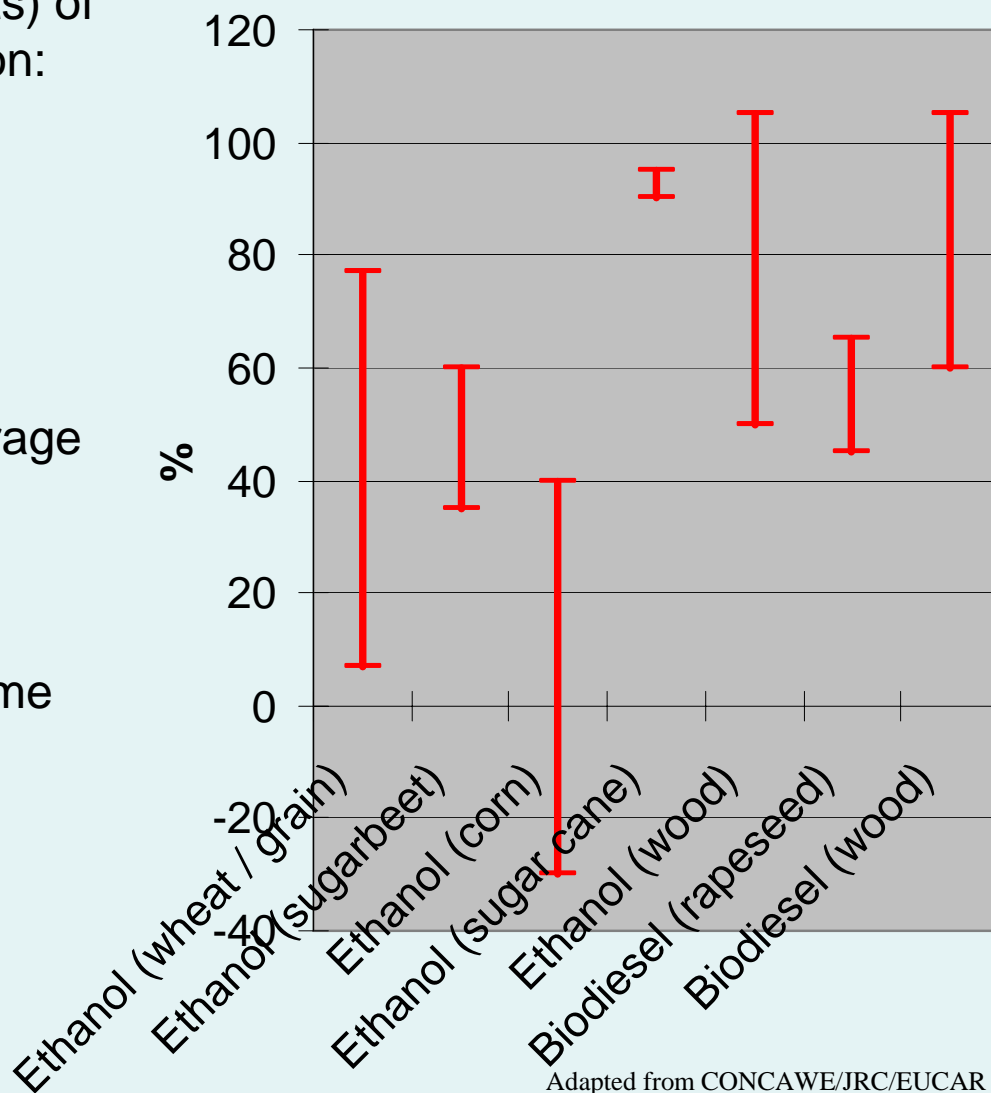
□ GHG savings (& production costs) of biofuels vary widely depending upon:

- Feedstock
- Cultivation processes
- Production processes
- By-product use

□ Incentives are needed to encourage supply of biofuels with the highest GHG savings

□ A sustainability assurance scheme is needed to mitigate wider environmental & social effects of biofuel production

% WTW GHG savings compared to petrol or diesel



A range of "hybrid" technologies are available



Citroen C3 – stop start



Honda Civic – Motor assist

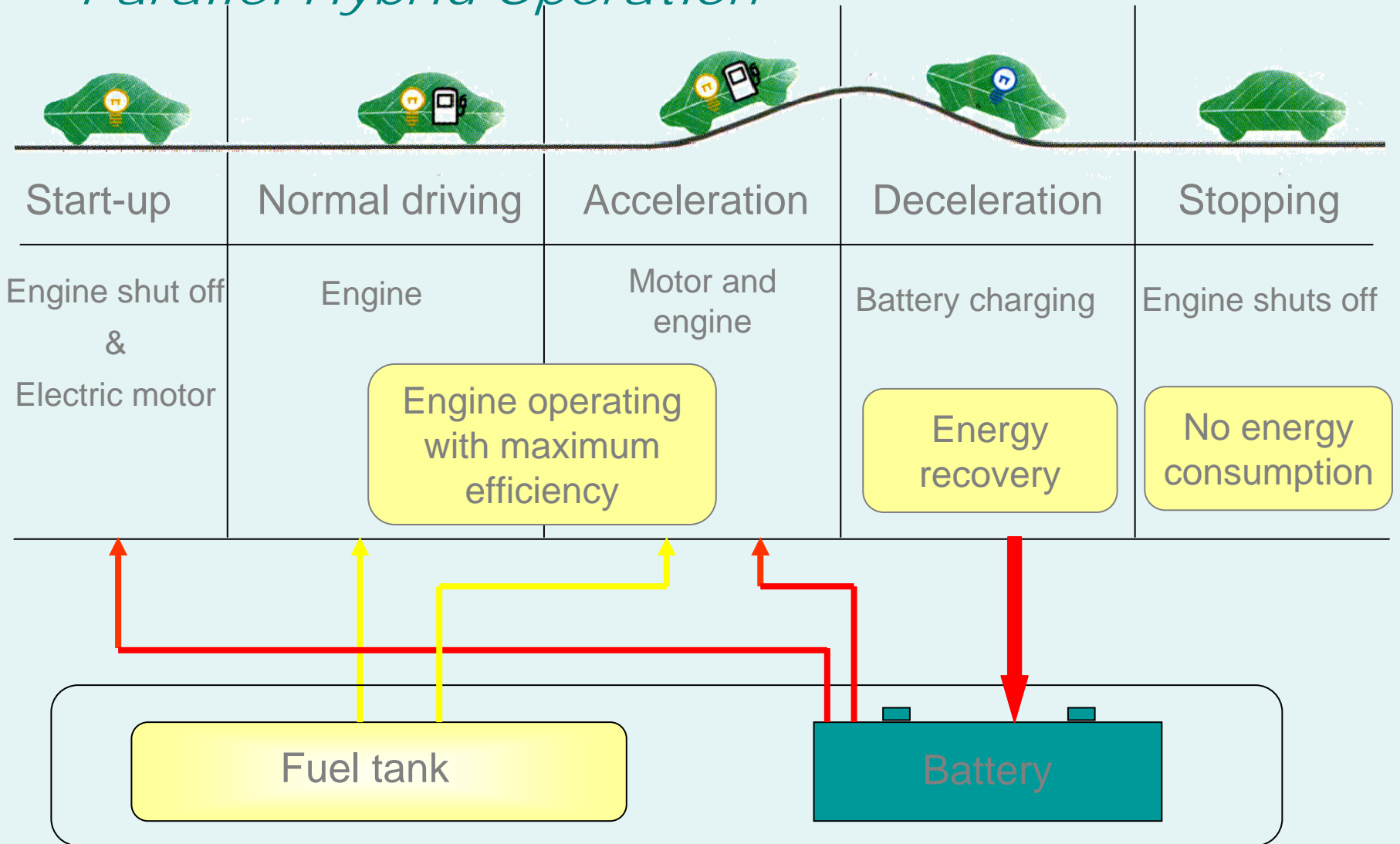


Toyota Prius – Parallel Hybrid

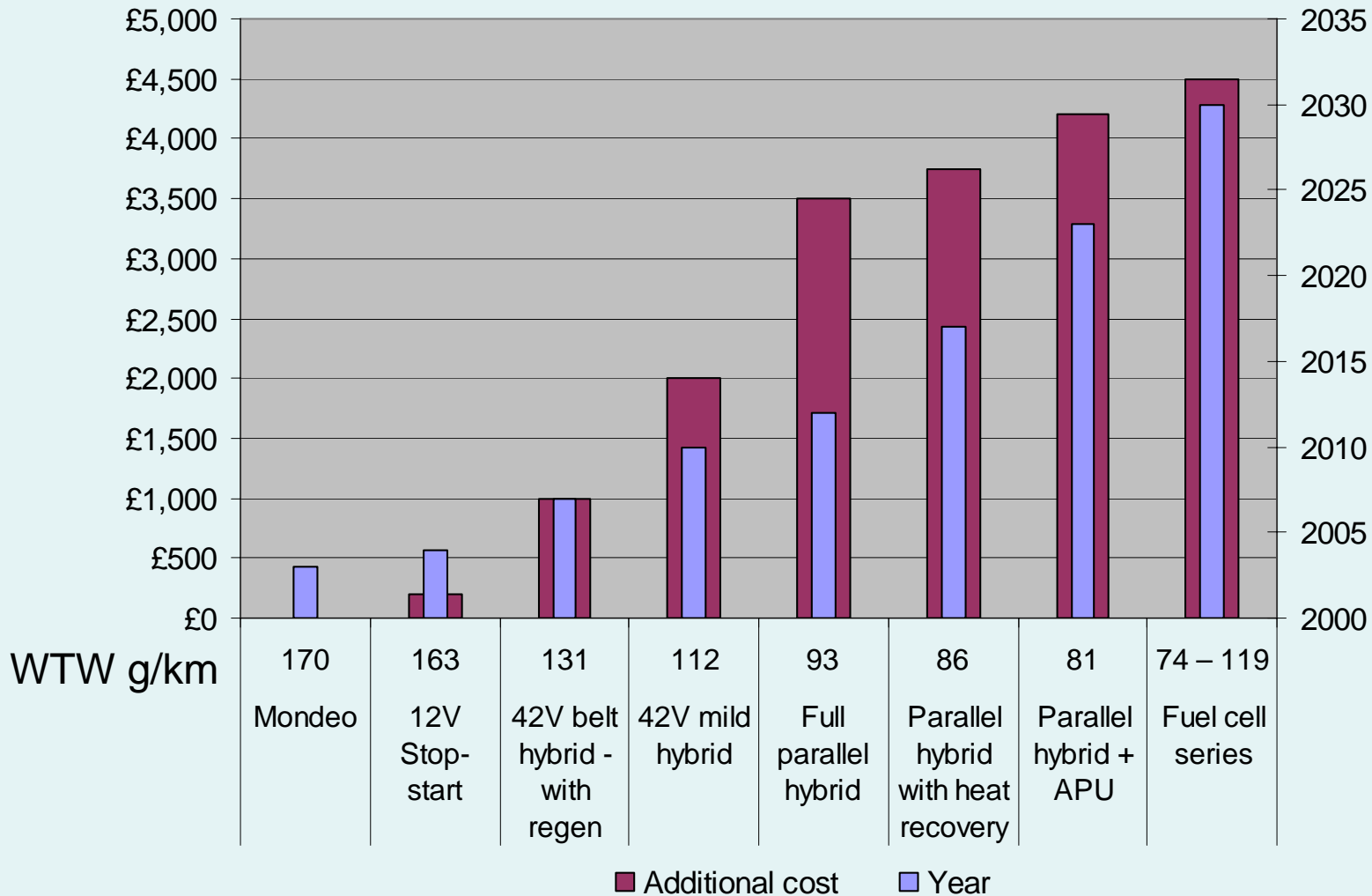


Lexus RX400h – Full Hybrid

Parallel Hybrid Operation



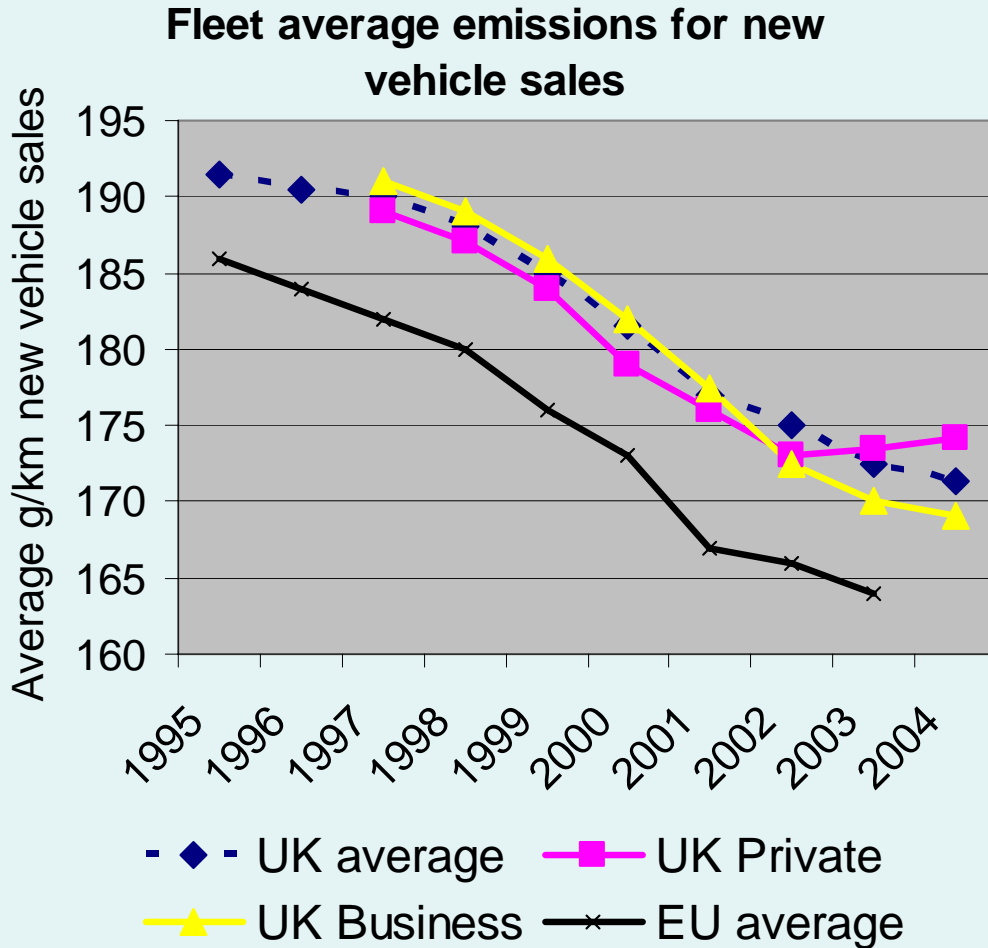
Hybrid provides an important evolutionary step to fuel cell vehicles in addition to providing a current technology



Supply of affordable fuel cell vehicles is someway off – although concept vehicles have been produced by a range of manufacturers



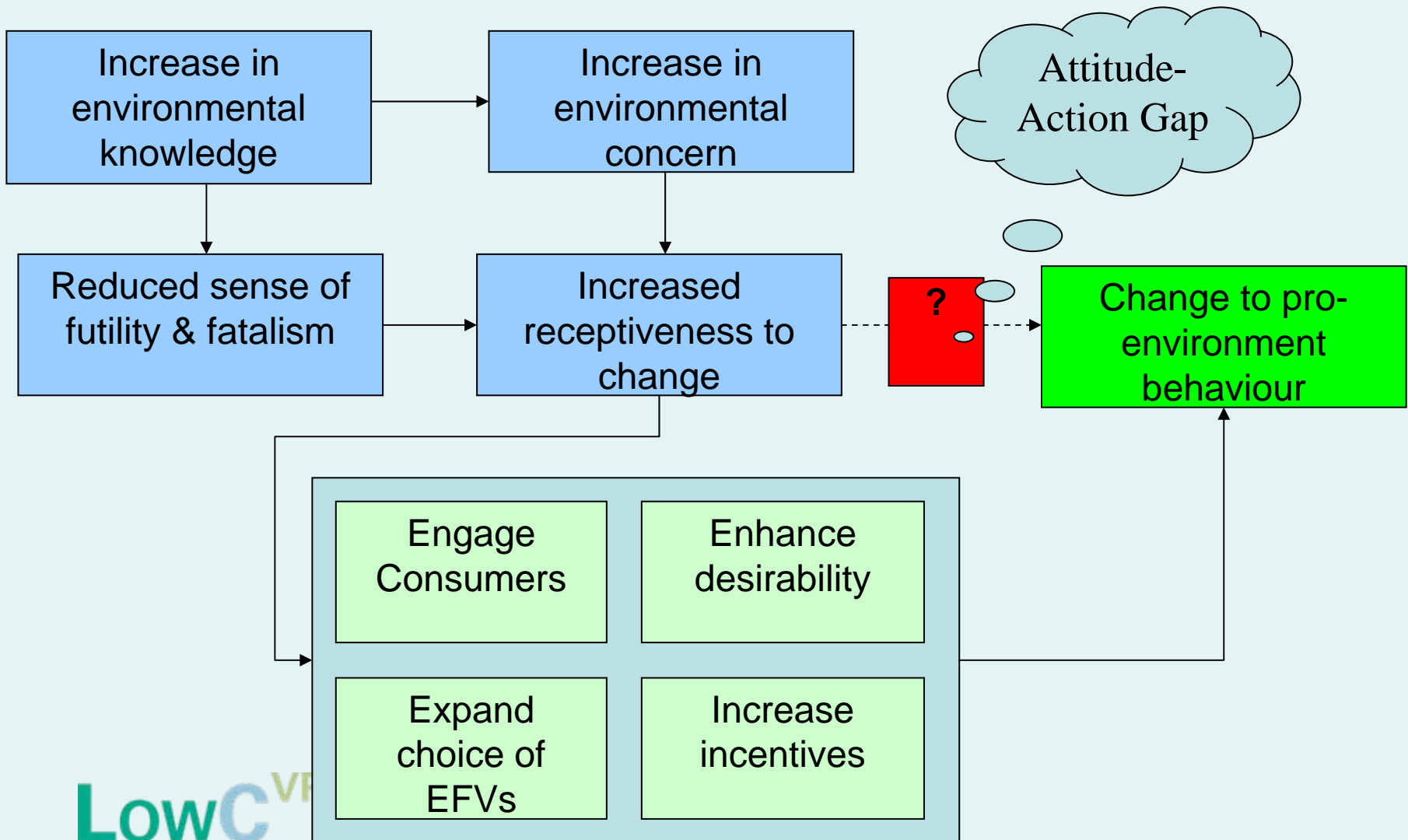
New cars are becoming more efficient - at about 1%pa



UK new car CO₂ improved by 11% in 10 years

- Fleet and business car efficiency is continuing to improve
- Private consumers have started to purchase less efficient vehicles
- Achieving EU targets is challenging

Increased demand for environmentally friendly vehicles requires bridging the attitude-action gap



Enhancing Consumer Information

| Fuel Economy | | Ford Fiesta 1.4 TDCI ZETEC |
|--|---|----------------------------|
| CO₂ emission figure (g/km) | | B 117 g/km |
| Fuel cost (estimated) for 12,000 miles <small>A fuel cost figure indicates to the consumer a guide fuel price for comparison purposes. This figure is calculated by using the combined drive cycle (town centre and motorway) and average fuel price. Re-calculated annually, the current cost per litre is as follows – petrol 75p, diesel 75p and LPG 30p (VCA May 2004).</small> | | £662 |
| VED for 12 months <small>Vehicle excise duty (VED) or road tax varies according to the CO₂ emissions and fuel type of the vehicle.</small> | | £85 |
| Environmental Information <small>A guide on fuel economy and CO₂ emissions which contains data for all new passenger car models is available at any point of sale free of charge. In addition to the fuel efficiency of a car, driving behaviour as well as other non-technical factors play a role in determining a car's fuel consumption and CO₂ emissions. CO₂ is the main greenhouse gas responsible for global warming.</small> | | |
| Make/Model Ford Fiesta 1.4 TDCI ZETEC Fuel type Diesel | Engine capacity (cc): 1399 Transmission type: 5 speed manual | |
| Fuel Consumption: | | |
| Drive cycle | Litres/100km | Mpg |
| Urban | 5.4 | 52.3 |
| Extra-urban | 3.8 | 74.3 |
| Combined | 4.4 | 64.2 |
| Carbon dioxide emissions (g/km): 117g/km <small>Important note: Some specifications of this make/model may have lower CO₂ emissions than this. Check with your dealer.</small> | | |
| | | |

Voluntary car industry initiative
 – brokered by LowCVP

Combination of simple and statutory information:
 – Label shows CO₂ emissions, estimated fuel costs and test cycle data

Bands linked to UK Vehicle Excise Duty

Labels presently in 75% of showrooms

Summary

- ❑ Levels of GHG will reach potentially “dangerous levels” in the next 10 years
- ❑ Road transport is a significant & growing source of GHG emissions
- ❑ Technology offers the potential to significantly reduce GHG emissions - but responsible vehicle use and other measures also have important roles
- ❑ There are a wide range of fuel and vehicle technology options available with different GHG savings and costs
 - Renewable hydrogen offers a long-term solution – but high costs are likely to constrain significant market development for the foreseeable future
- ❑ There is a low level of consumer awareness & interest in low carbon car options
 - Low carbon vehicle technologies are more expensive & payback periods long
- ❑ Changing consumer attitudes requires additional incentives & measures to increase desirability, a wider range of models from which to choose and better consumer engagement

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