

Vehicle and fuel technology - now and in the future

Cheltenham Low Carbon Partnership

Cheltenham Borough Council

11th May 2010

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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

Renewable Fuels Agency

Carbon and Sustainability Reporting Within the Renewable Transport Fuel Obligation

Technical Guidance Part One

Office of the Renewable Fuels Agency V1.2

August 2008

cenex

ACT ON CO₂

LowCVP 'Low Carbon Road Transport Challenge'

Proposals to reduce road transport CO₂ emissions in the UK to help mitigate climate change

June 2008

Fuel Economy

Fuel Economy	Low Carbon Car
<100	B 107 g/km
101-120	
121-140	
141-160	
161-180	
181-220	
>220	

Fuel used (predicted) for 1000 miles

£662

VED for 12 months

£50

LowCVP Accelerating the Shift to Low Carbon Vehicles and Fuels

Low Carbon Transport Innovation Strategy

LowCVP low carbon vehicle partnership

ACT ON CO₂

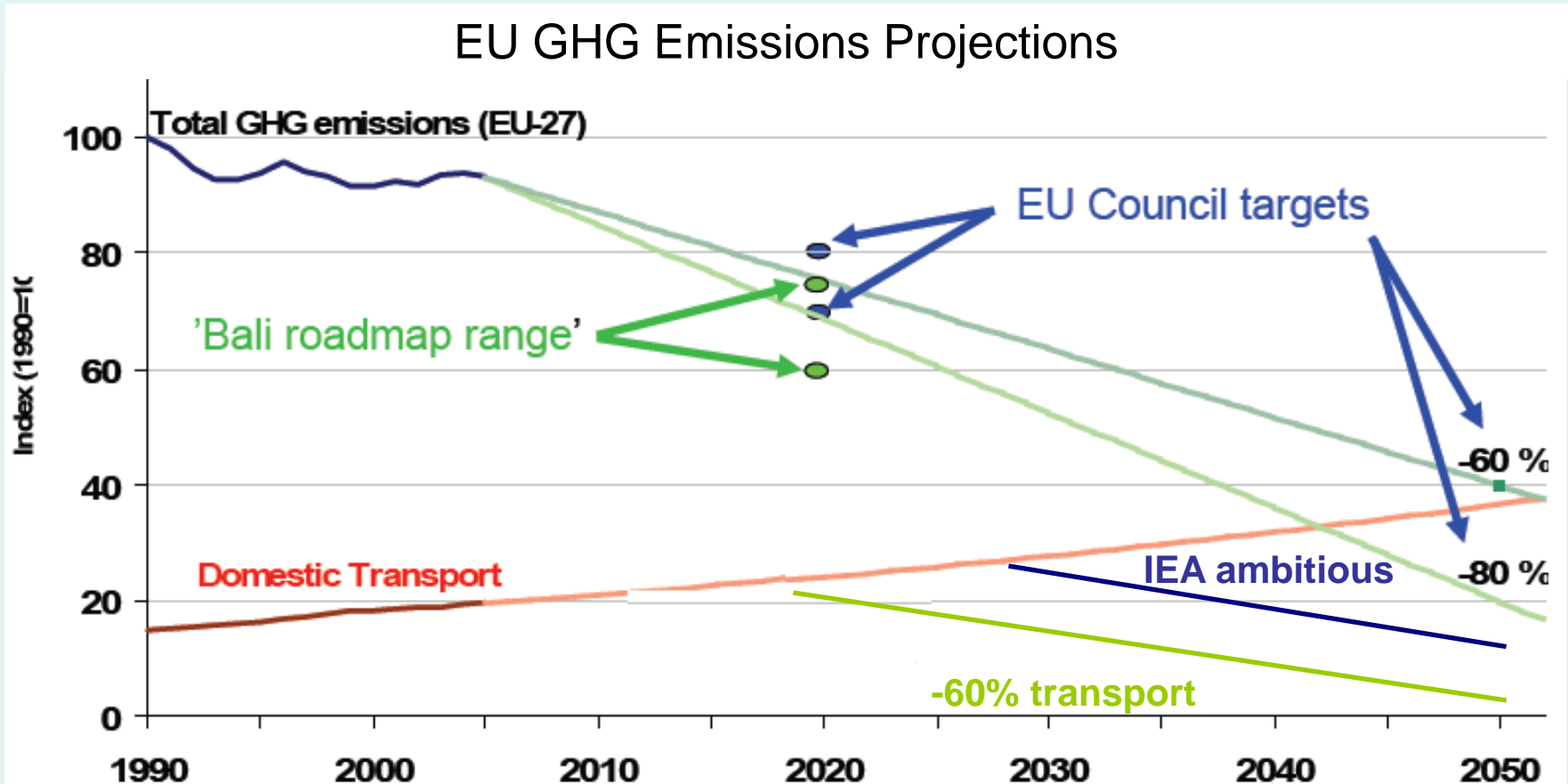
LowCVP low carbon vehicle partnership

Outline

- ❑ The scale of the challenge & opportunity
- ❑ The technology roadmap for low carbon vehicles
- ❑ Role of electrification of road transport
- ❑ Challenges for sustainable fuels
 - Biofuels / hydrogen / electricity
- ❑ Opportunities for reducing your carbon footprint today
 - Sources of information

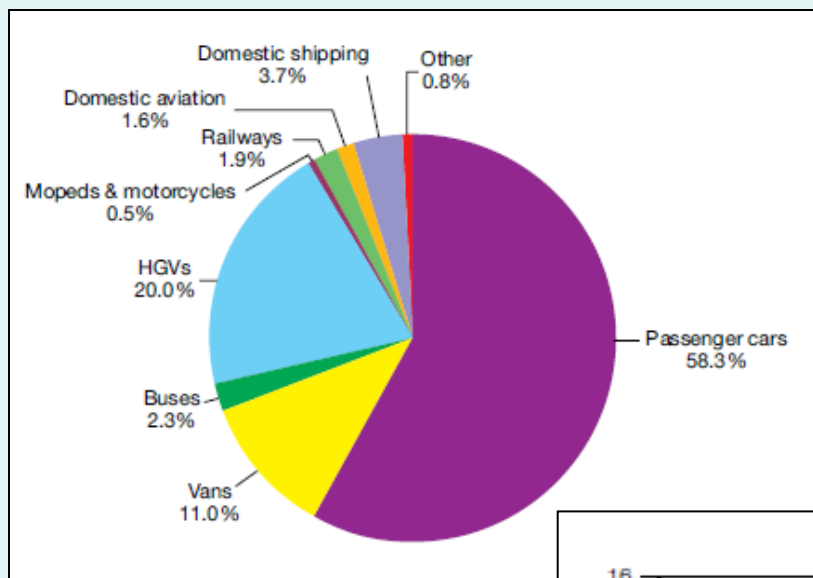


EU domestic transport emissions will consume the available CO2 budget on current trends. Even ambitious scenarios leave inadequate headroom for other sectors

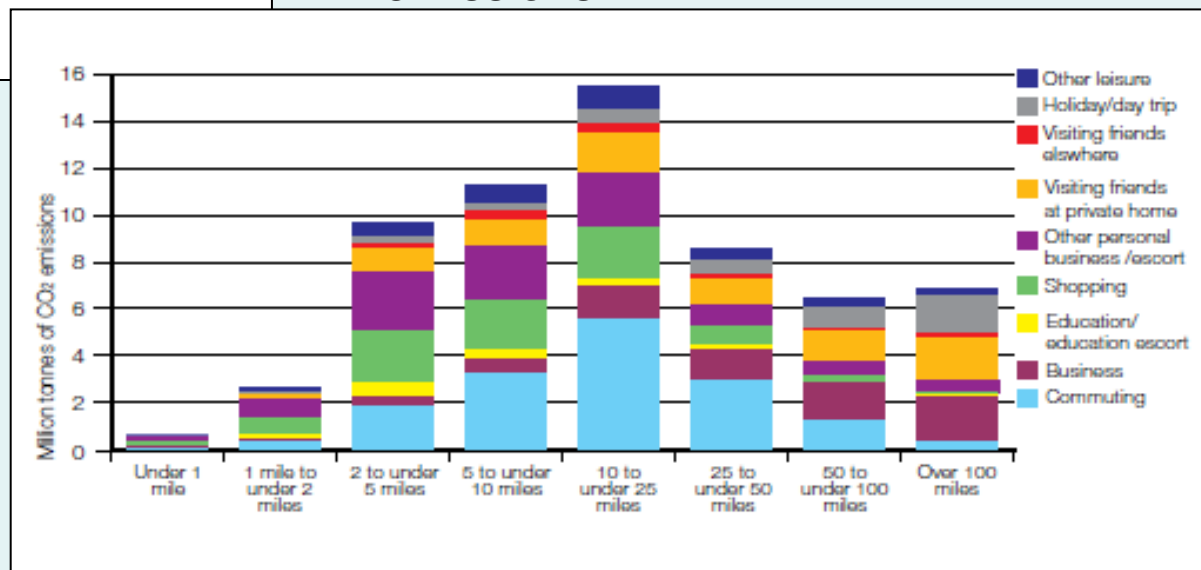


Adapted from EEA 2009 & TNO 2009

Climate Change Act 2008 requires UK to reduce emissions by 34% by 2020 and 80% by 2050 compared to 1990

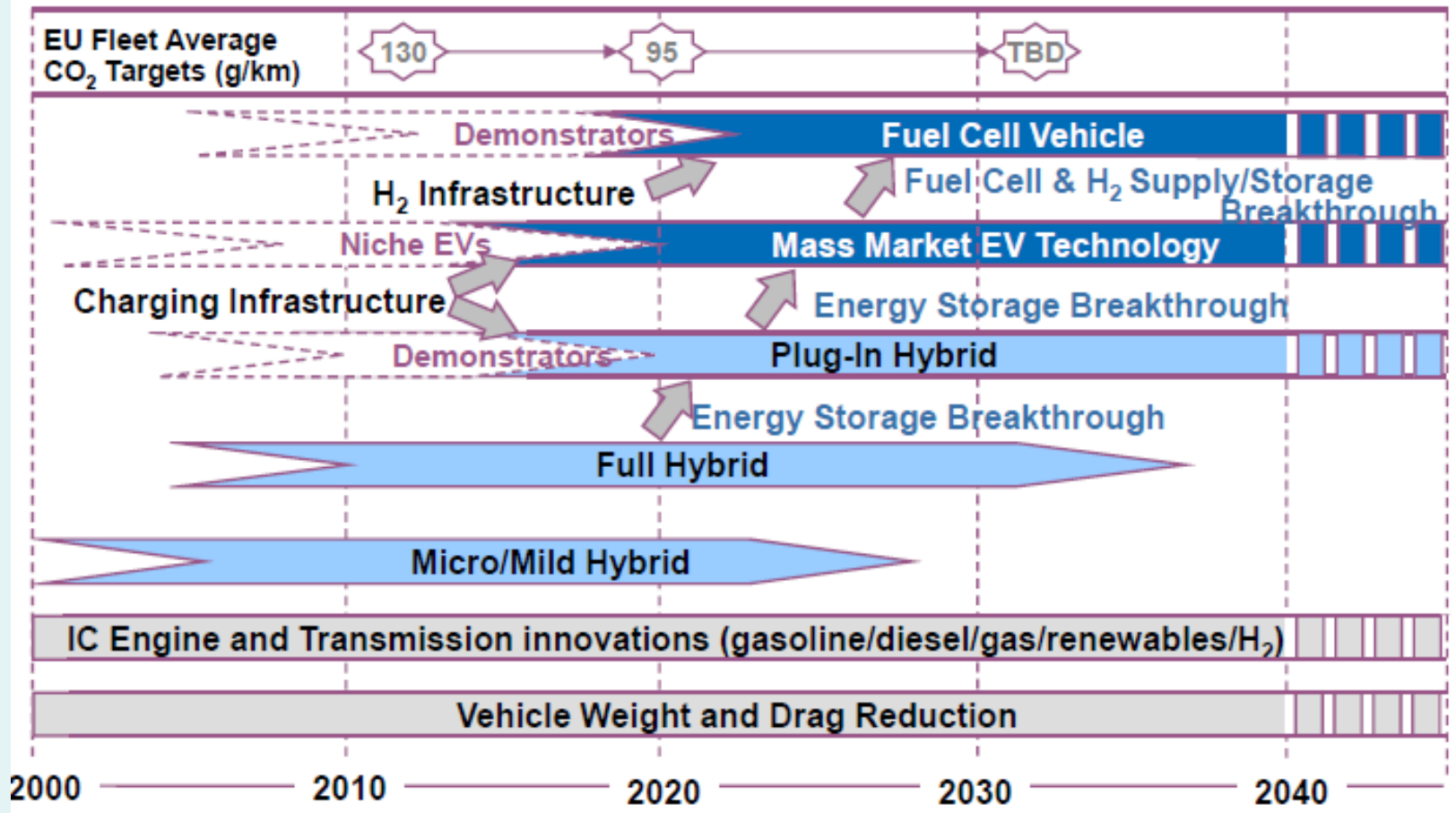


- ❑ Domestic transport accounts for 21% of UK emissions, up 12% since 1990
- ❑ Road transport accounts for 92% of UK transport emissions
- ❑ Commuting and businesses trips generate over a third of car emissions



There is emerging consensus on the future evolution of low carbon car technologies

NAIGT low carbon car technology roadmap



There is global momentum towards electrification of transport

- ❑ EVs address key geopolitical concerns:
 - Climate
 - Energy security
 - Peak oil

- ❑ Early consumer interest as sustainable, cool, high technology products

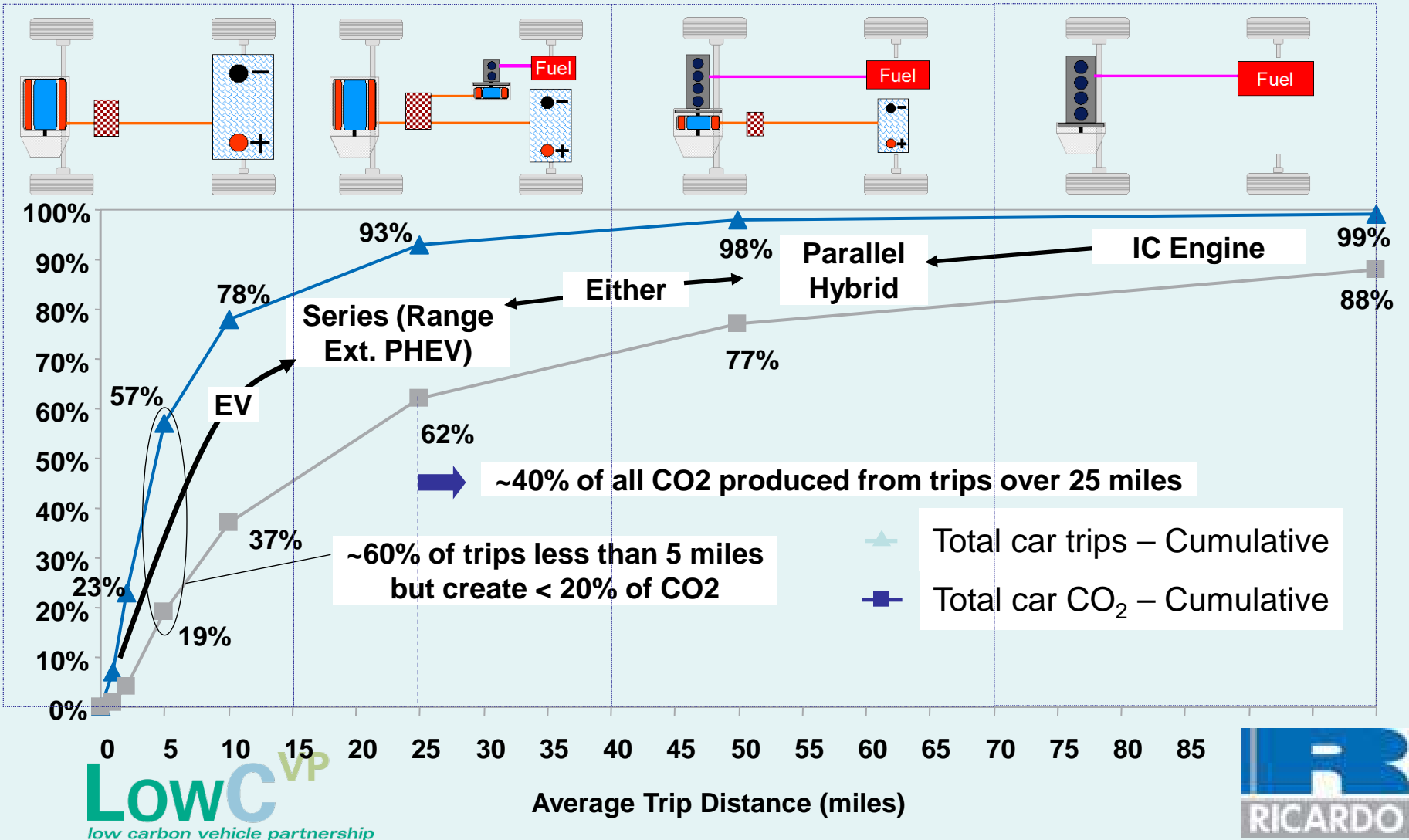
- ❑ Substantial public funding of RD&D

- ❑ Investment & commitment from global OEMs

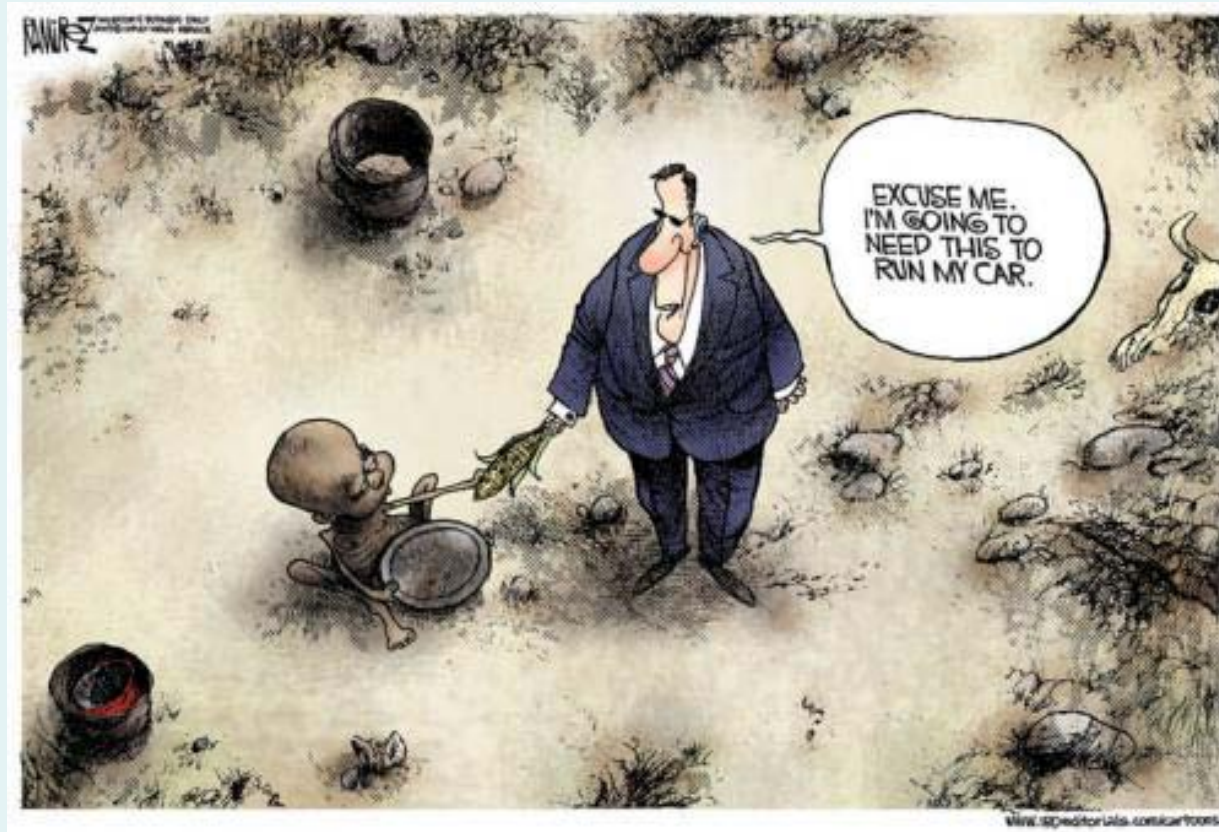
But ... electric vehicles will not be the silver bullet appropriate for all applications




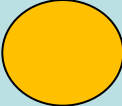
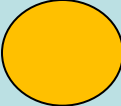
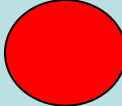





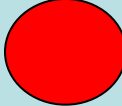




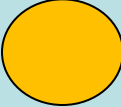
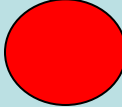




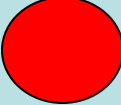
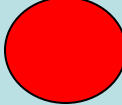







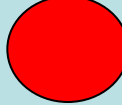
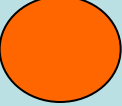





*Technology will be tailored to the application:
 EV for city use, PHEV or parallel hybrid for medium length
 journeys; IC for long journeys*



Reducing the carbon footprint of fuels is challenging

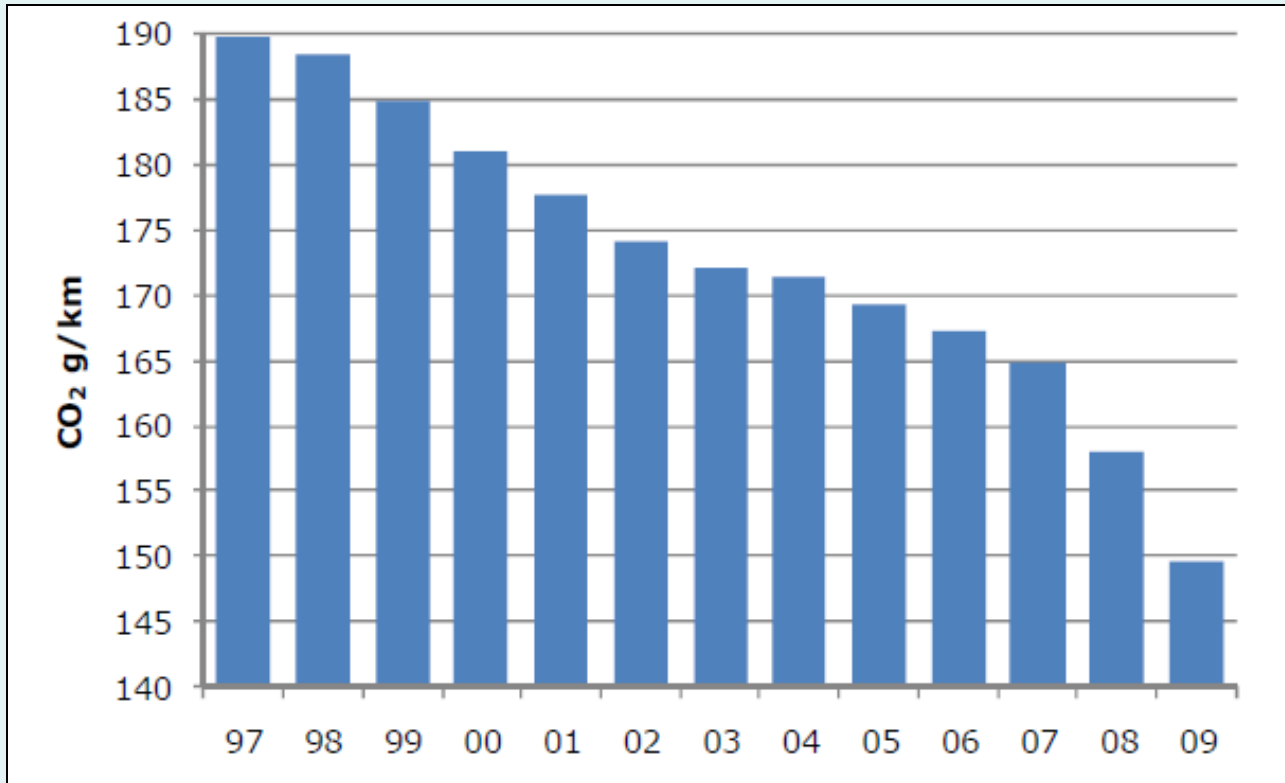


To 2020 the challenge is to ready the market for renewable fuels – but which option?

	1st G Bio	2nd G Bio	H2-IC	H2-FCV	Bio- CH4	EV
Technology readiness						
Cost competitiveness						
Vehicle availability						
Infrastructure deployment						
Driver acceptability						
Sustainability						

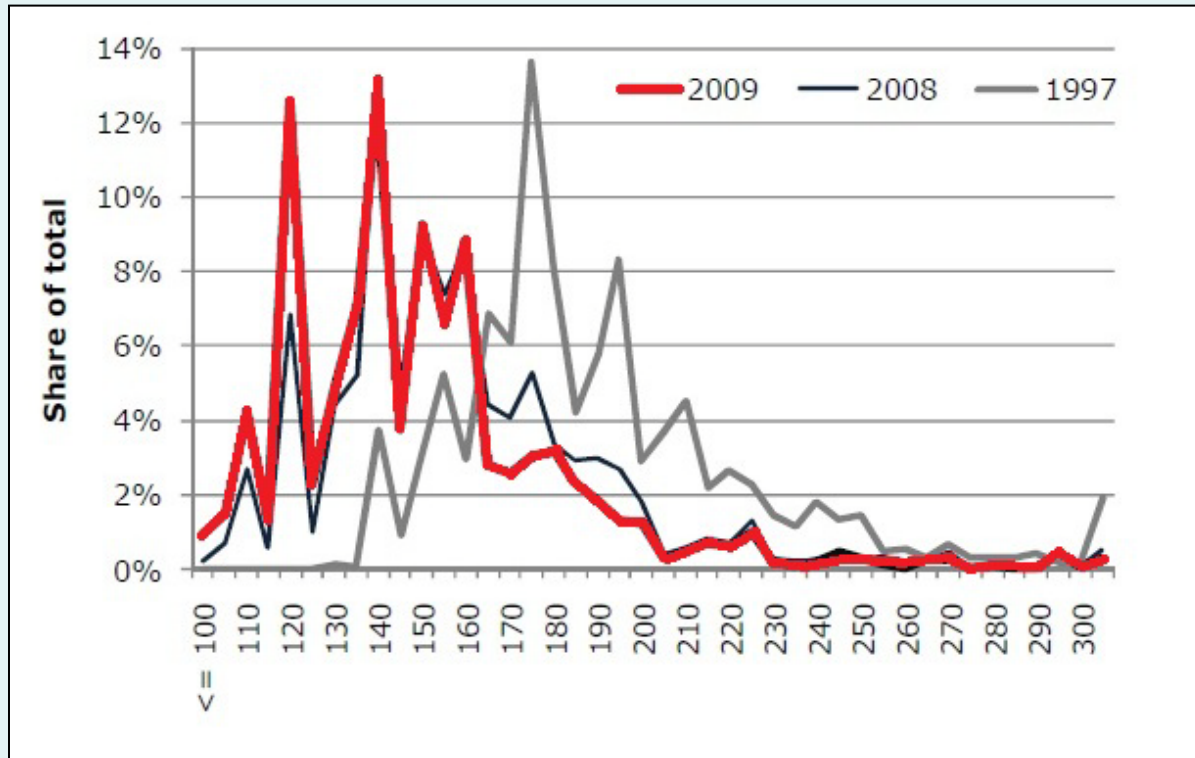
NB: The relative scores do not represent LowCVP policy

Average new car CO₂ emissions reduced by a record 5.4% in 2009



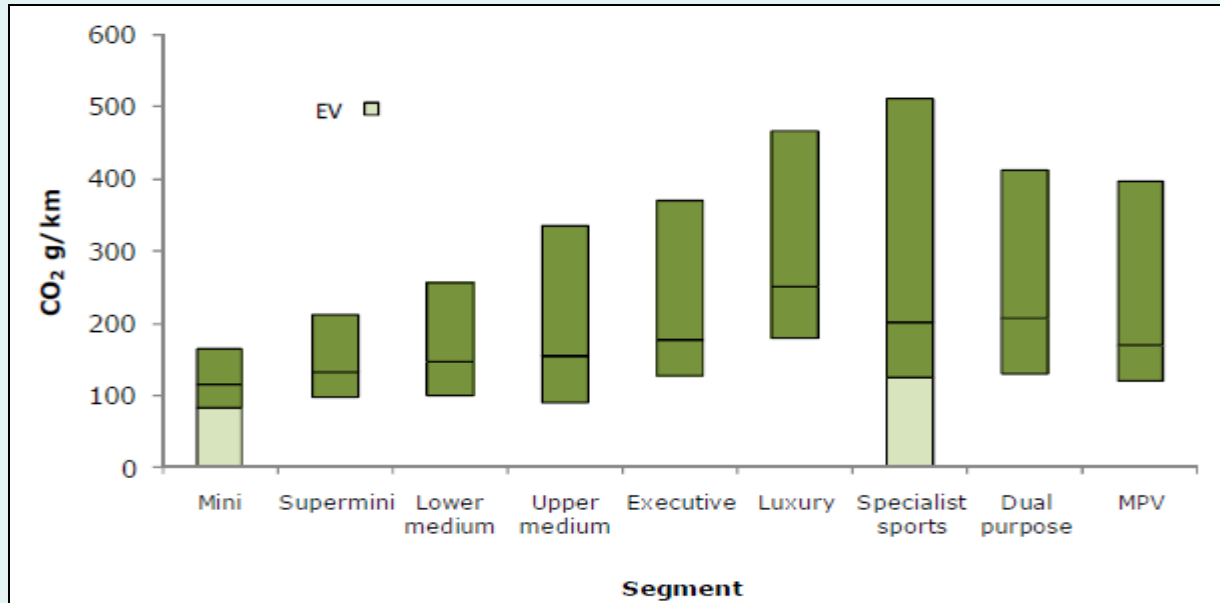
- ❑ Emissions have fallen 21.2% since 1997, falling every year
- ❑ Continuing efforts by manufacturers to comply with EU regulations and the economic climate most important drivers

Shift to lower carbon cars is a market trend which is continuing



- ❑ Sub 120 CO2 g/km cars account for 20% of new car registrations
- ❑ Technology gains as well as market shift key to improvements
- ❑ Host of new models and eco sub brands introduced

Choosing best in class offers significant opportunities to reduce carbon footprint now



Segment	Average	Lowest	Make/model	Low vs average
Mini	115.6	0*	Smart fortwo EV	-
Supermini	131.9	98	Ford Fiesta/SEAT Ibiza	-25.7%
Lower Medium	147.4	99	VW Golf	-32.8%
Upper medium	154.4	89	Toyota Prius	-42.4%
Executive	177.1	127	Mercedes C Class	-28.3%
Luxury	250.3	178	BMW 7 series	-28.9%
Sports	201.1	0*	Tesla	-
Dual purpose	207.1	129	Toyota Urban Cruiser	-37.7%
MPV	169.7	119	Citroen Nemo Multispace	-29.9%

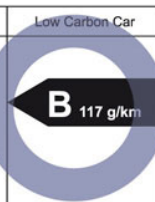




94% of new car showrooms provide point of sale CO2 labelling

Thirteen VED bands

The figures on the coloured arrows (A-M) indicate the 13 ranges of emissions by g/km that correspond to levels of annual Vehicle Excise Duty (VED or Road Tax). Low carbon-emitting cars pay less tax. The lowest – Band A – pay no tax.

Make, model and engine details

The vehicle make, model, fuel type, engine capacity and transmission type are all listed. Together they determine the CO₂ emissions and running costs.

Fuel Economy		Low Carbon Car												
CO ₂ emission figure (g/km)		 B 117 g/km												
≤100 A														
101-110 B	111-120 C													
121-130 D	131-140 E													
141-150 F	151-165 G													
166-175 H	176-185 I													
186-200 J	201-225 K													
226-255 L	256+ M													
Fuel cost (estimated) for 12,000 miles <small>A fuel cost figure indicates the no-charge, a guide, fuel price for comparison purposes. This figure is calculated by using the combined drive cycle (urban, extra-urban and motorway) and average fuel price. Re-calculated annually, the current cost per litre is as follows – petrol 116p, diesel 131p and LPG 56p.</small>			 £1,104 £35											
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>														
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: Low Carbon Car			Engine Capacity (cc): 1399											
Fuel Type: Diesel		Transmission: 5 speed manual												
Fuel Consumption: <table border="1" style="width: 100%;"> <thead> <tr> <th>Drive cycle</th> <th>Litres/100km</th> <th>Mpg</th> </tr> </thead> <tbody> <tr> <td>Urban</td> <td>5.4</td> <td>52.3</td> </tr> <tr> <td>Extra-urban</td> <td>3.8</td> <td>74.2</td> </tr> <tr> <td>Combined</td> <td>4.4</td> <td>64.2</td> </tr> </tbody> </table>			Drive cycle	Litres/100km	Mpg	Urban	5.4	52.3	Extra-urban	3.8	74.2	Combined	4.4	64.2
Drive cycle	Litres/100km	Mpg												
Urban	5.4	52.3												
Extra-urban	3.8	74.2												
Combined	4.4	64.2												
Carbon dioxide emissions (g/km): 117 g/km <small>Important note: Some specifications of this make/model may have lower CO₂ emissions than this. Check with your dealer.</small>														
  														

CO₂ emissions figure

The black arrow points to the vehicle's relevant band of CO₂ emissions on which Vehicle Excise Duty (VED or Road Tax) is based.

Running costs

Average yearly fuel costs are calculated and displayed together with the relevant level of Road Tax. Figures updated with recent prices.

Fuel consumption

Shows how efficient the car is in miles per gallon and litres per 100km in town, country and combined driving situations.

Top 10 fuel efficient / low carbon cars available via Act on CO2 and VCA websites

ACT ON CO₂

Climate change: the facts | What you can do | What Government is doing | What business is doing | Campaigns | About ACT ON CO₂

What you can do

- In the home
- On the move
 - Walking and cycling
 - Door-to-door journey planning
 - Compare CO₂ emissions of cars, trains, coaches and planes
 - Smarter driving savings calculator
 - Driving your car
 - Sharing your car
 - Car clubs
 - Compare car CO₂ emissions
- Out shopping
- Community

On the move
Transport contributes around one-fifth (23%) of domestic CO₂ emissions, so lowering the CO₂ produced by travel is crucial!

Reduce transport CO₂ emissions

Walking and cycling
With a quarter of all car journeys under two miles, walking or cycling instead



Rank	Make	Model	Edition	Gear box	Fuel	Tax Band / Cost P/A	CO ₂ (g/km)
1	MERCEDES-BENZ	B-Class	B 180 BlueEFFICIENCY with 195/65 15" or 205/55 16" rear wheels	M	Petrol	F £125 1ST YEAR £125	146
2	MERCEDES-BENZ	B-Class (245) Saloon	B 150 BlueEFFICIENCY 195/205 Tyres at rear	M	Petrol	F £125 1ST YEAR £125	148
3	MERCEDES-BENZ	B-Class	B 160 BlueEFFICIENCY with 195/65 15" or 205/55 16" rear wheels	M	Petrol	F £125 1ST YEAR £125	149
4	MAZDA	Mazda6	1.8 4 Door	M	Petrol	G £155 1ST YEAR £155	152
4	TOYOTA	Avensis	4 door 1.6 V-matic 5 speed Manual	M	Petrol	G £155 1ST YEAR £155	152
4	MERCEDES-BENZ	B-Class (245) Saloon	B 170 BlueEFFICIENCY 195/205 Tyres at rear	M	Petrol	G £155 1ST YEAR £155	152
5	TOYOTA	Avensis	1.8 4 Door V-Matic 6-speed Manual	M	Petrol	G £155 1ST YEAR £155	154
5	TOYOTA	Avensis	4 door 1.8 V-matic 6 speed	M	Petrol	G £155 1ST YEAR £155	154
6	VOLKSWAGEN	Passat Saloon	1.4 TSI (122 PS) S	M	Petrol	G £155 1ST YEAR £155	155
7	SKODA	New Superb	1.4 TFSI 125PS	M	Petrol	G £155 1ST YEAR £155	157

Vehicle and fuel technology

- ❑ Energy management and weight reduction key technologies for present
- ❑ Electrification of transport will be developed
- ❑ Biofuels likely to play a role although sustainability issues to be addressed
- ❑ Different technologies better suited to different applications
- ❑ Potential to significantly reduce CO2 emissions and cut costs through better vehicle selection now



Thank you for your
attention

Any Questions?

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The Low Carbon Vehicle Partnership

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