Accelerating the shift to low carbon cars

All Party Parliamentary Group on Peak Oil and Gas
Future Car Technologies: What next after a century of oil?

House of Commons
20th January 2009

Greg Archer
Director, Low Carbon Vehicle Partnership

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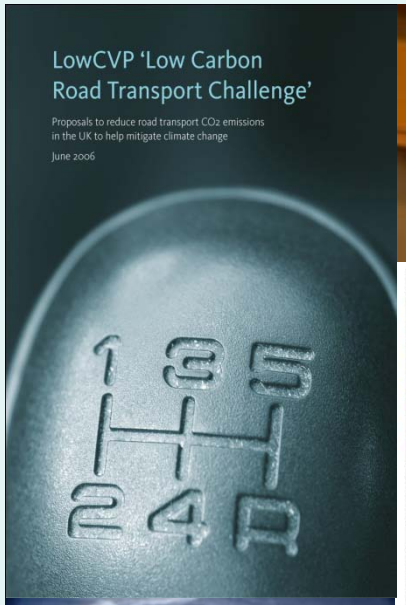
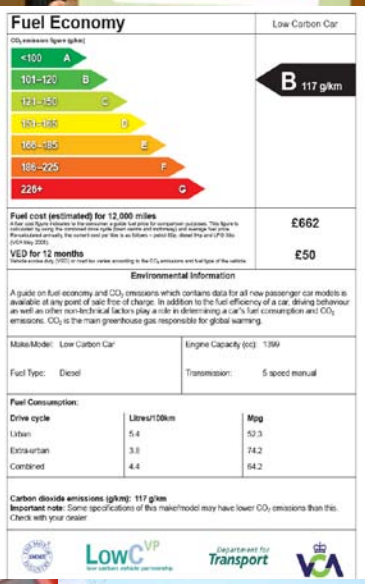
Accelerating a sustainable shift to low carbon vehicles and fuels in the UK

Stimulating opportunities for UK businesses





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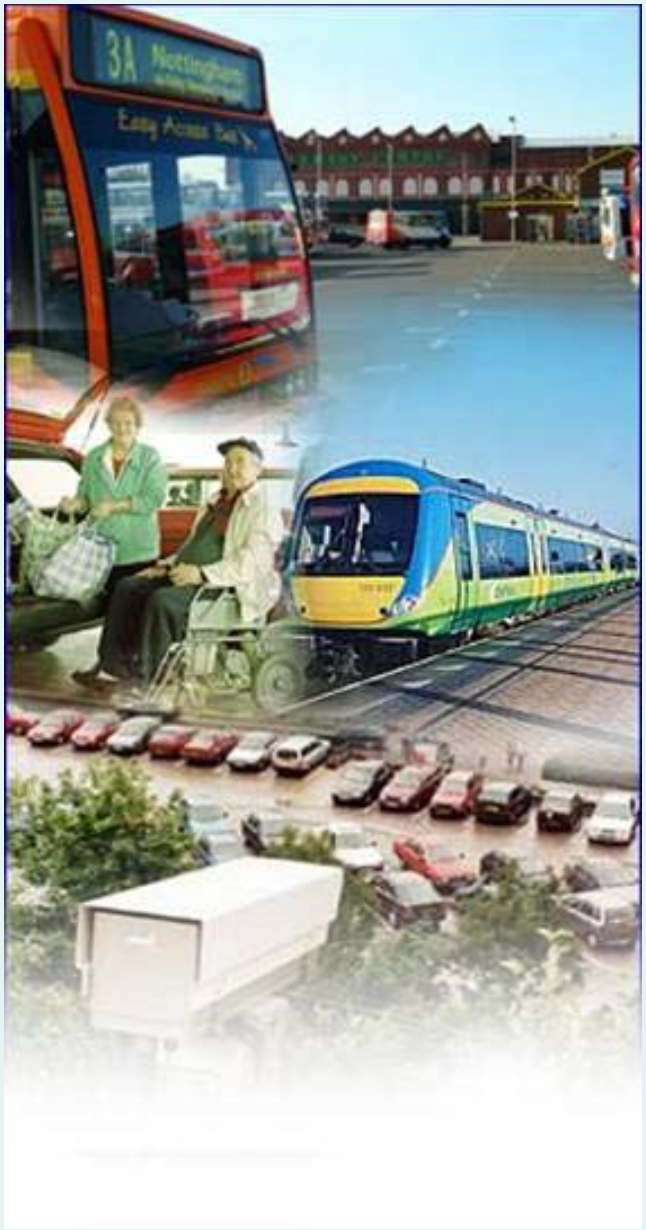
Scope

- The scale of the challenge

- Technology solutions
- Deployment challenges
- Policy effectiveness

  - Vehicle technologies
  - Biofuels
  - Electric Vehicles
  - Hydrogen fuel-cells

- The future?



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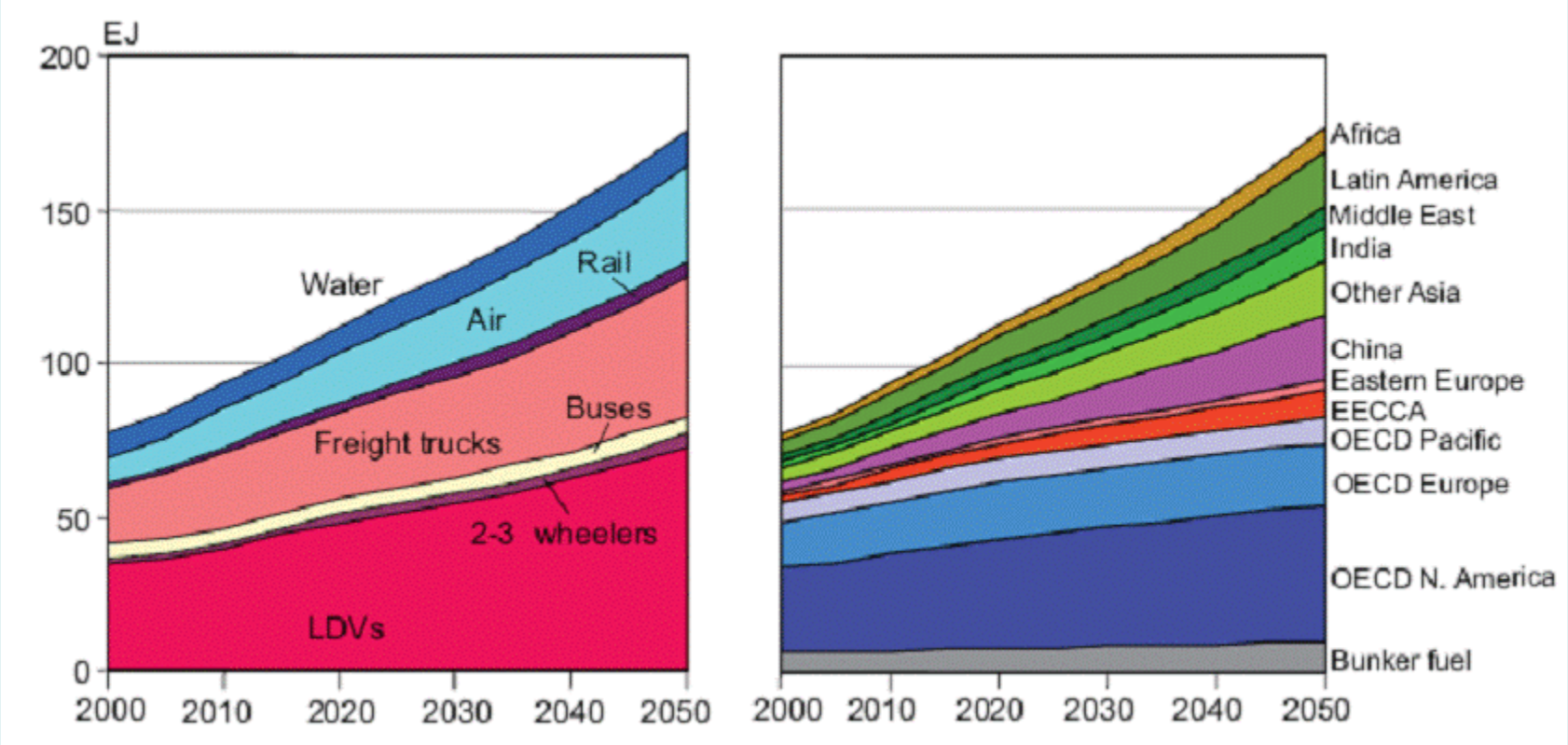
Global energy demand for transport is projected to more than double by 2050



IEA 2008, citing WBCSD 2004

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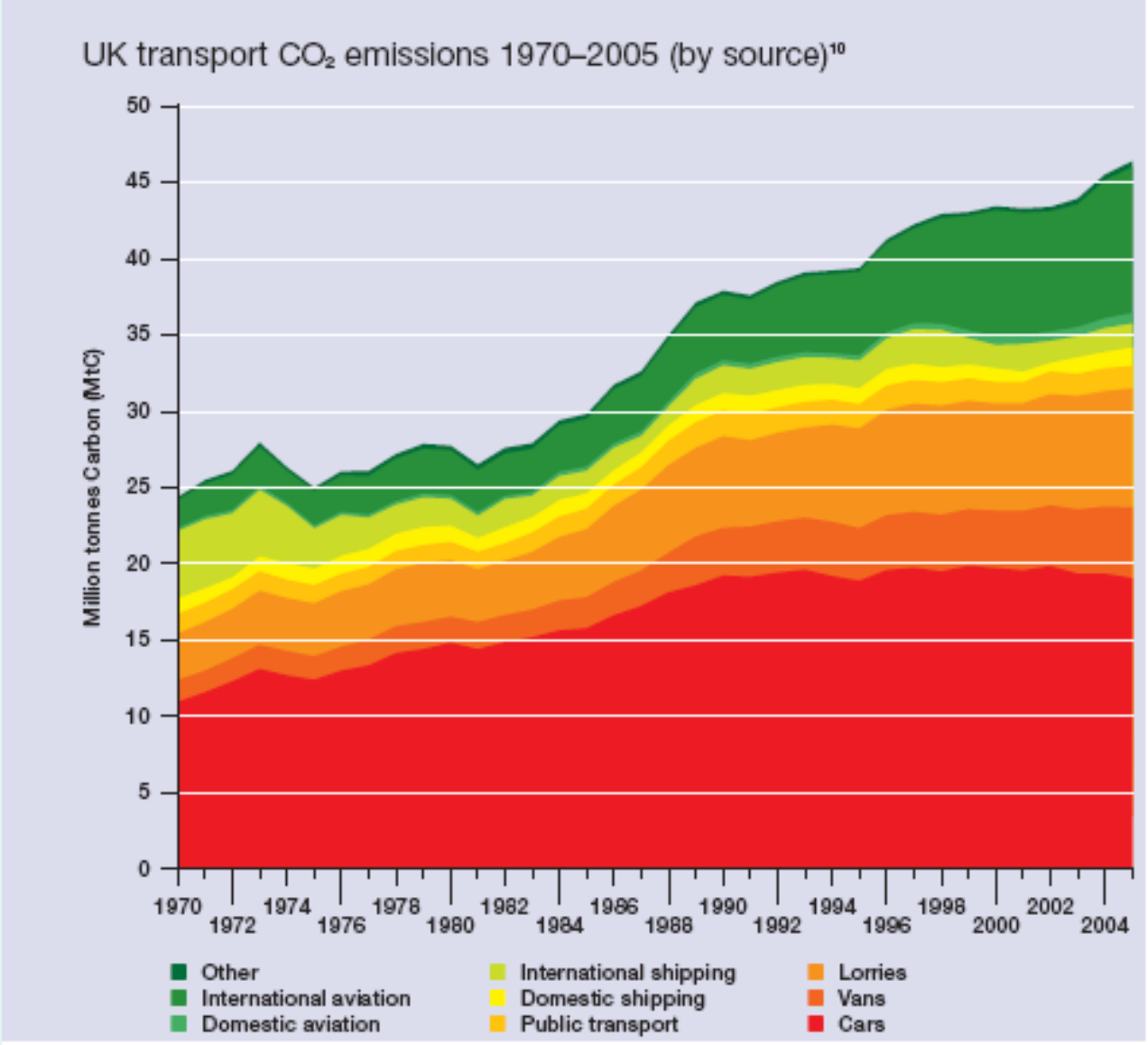
UK transport emissions have almost doubled since 1970

Emissions trends are driven by:

- The demand for movement and need to access facilities, services and goods
- The mode of transport used
- The carbon intensity and efficiency of the mode
- The operational efficiency of vehicle use



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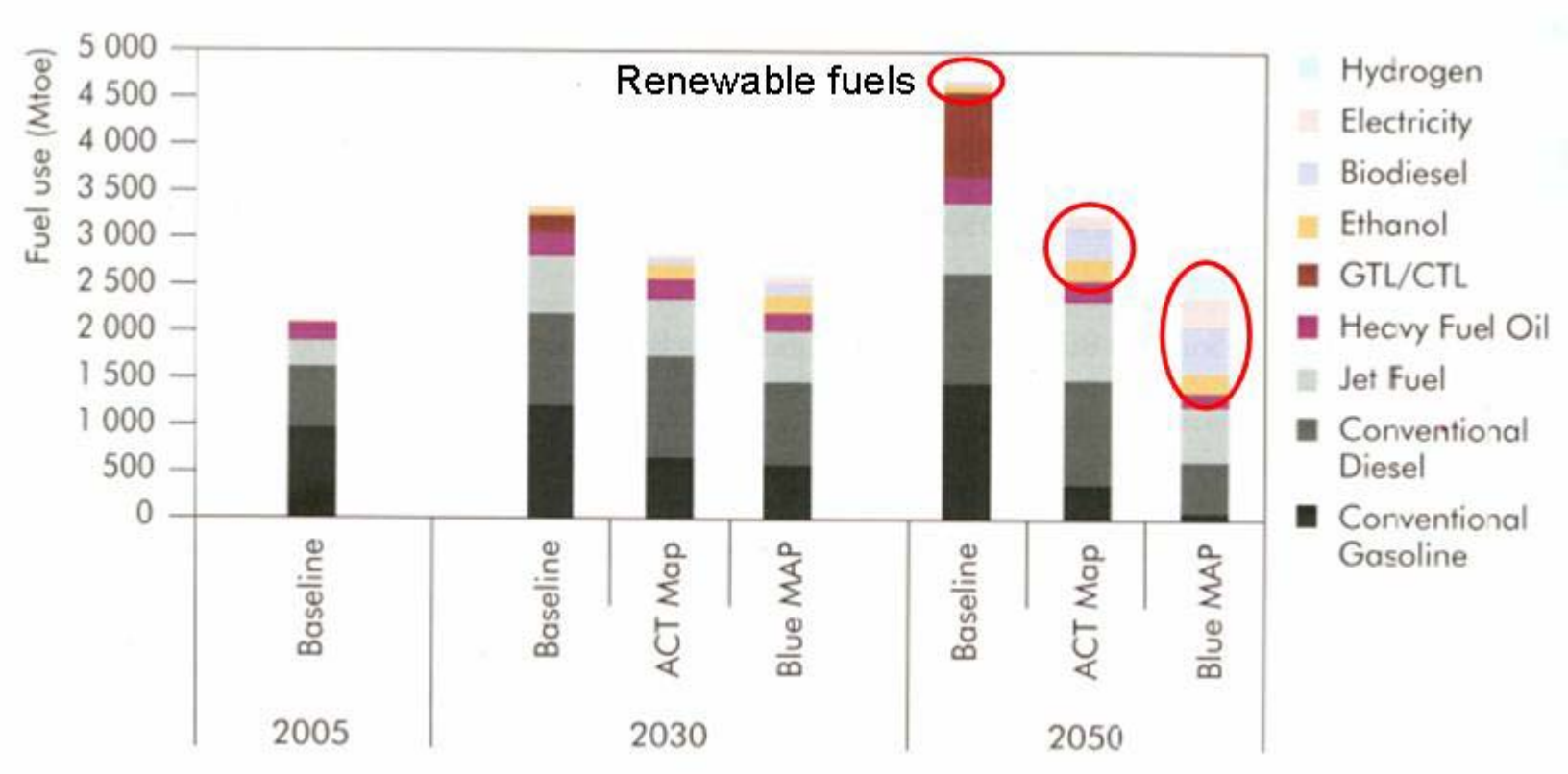
BAU is for increasing amounts of higher carbon intensity fossil fuels for transport

Energy use by year and scenario



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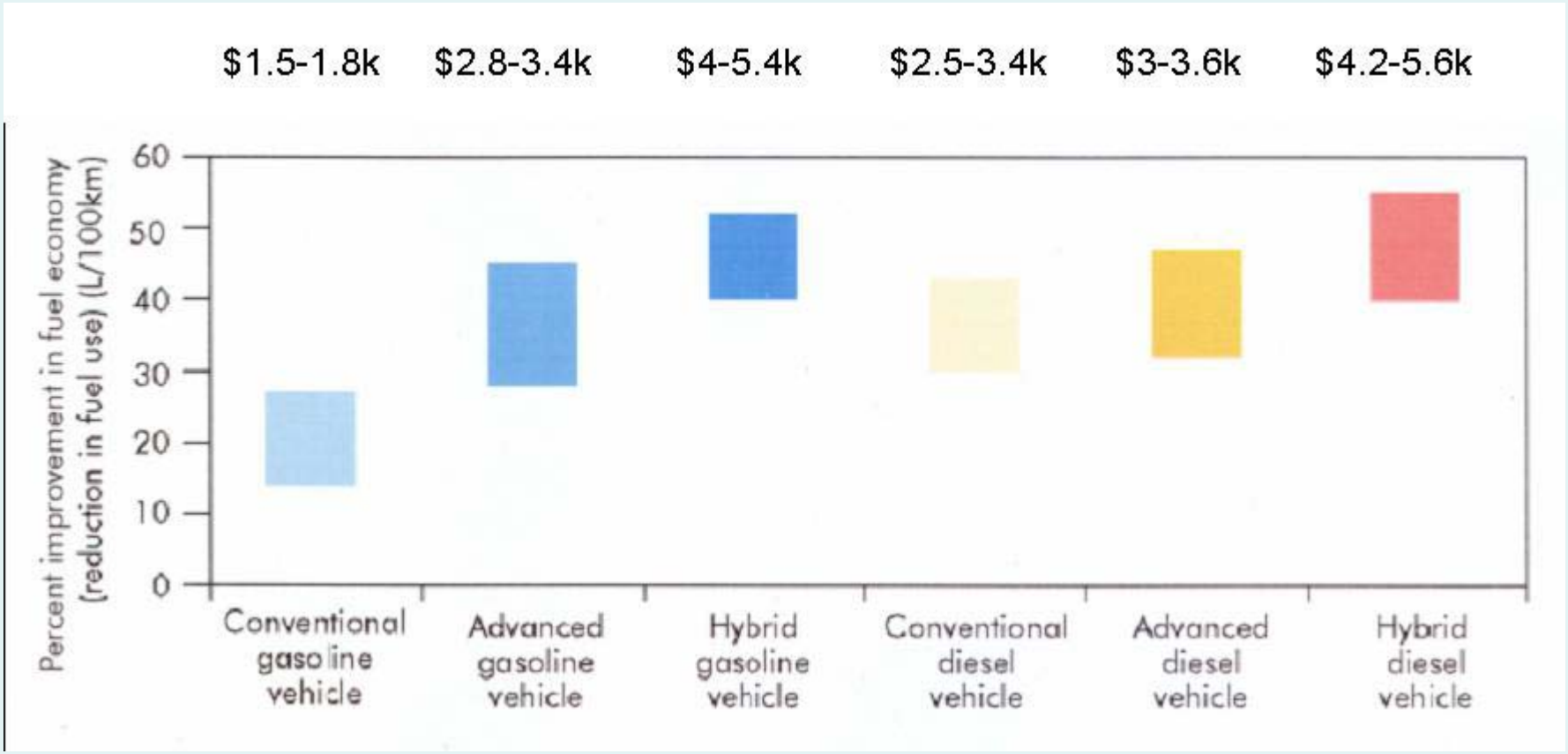
IEA 2008, Energy Technology Status and Outlook

50% fuel economy savings are possible using existing technology – at a cost



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IEA 2008, Energy Technology Status and Outlook

Progress is being made –
2008 saw the introduction of a range of low carbon models

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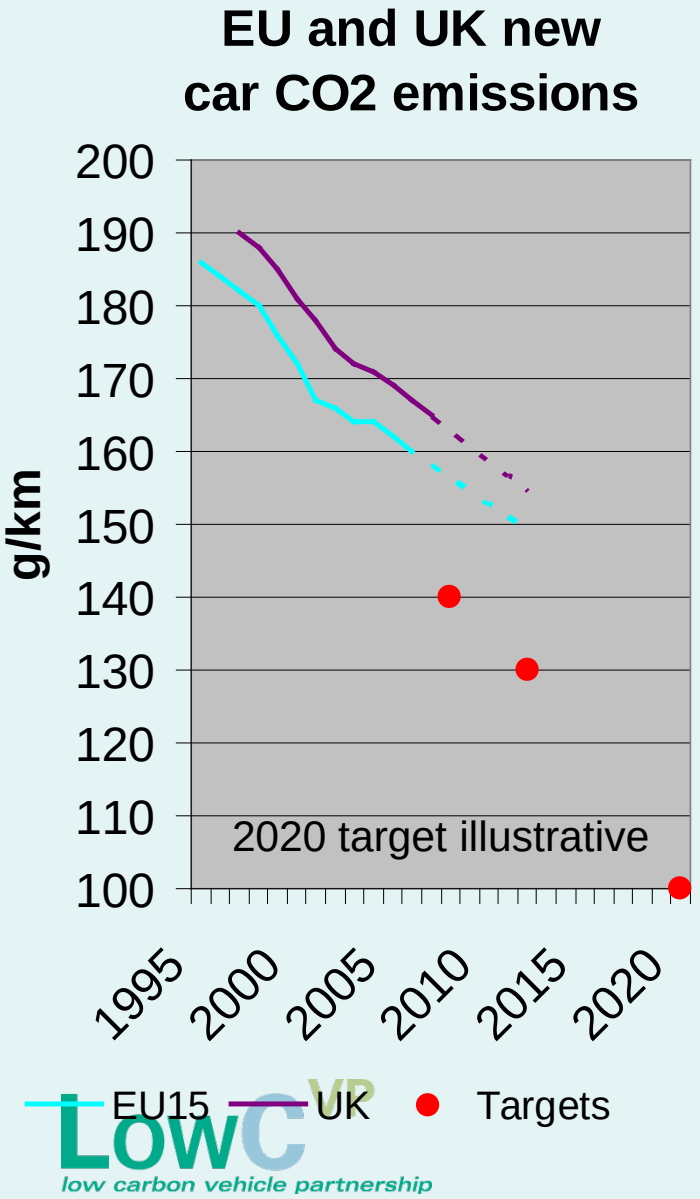
New car CO2 emissions are falling slowly - Technology deployment remains the challenge



- Current new car emissions and the progress to reduce these since 1990 is highly variable:

	Change	g/km
– EU	c -12%	160
– Japan	- 19%	145
– US	+ 4.5%	250
– Australia	-1.0%	-
– China	-	190

- Progress constrained by:
  - Increasing vehicle size
  - Increasing vehicle power
  - Increased equipment specification
  - Low consumer demand
  - Low oil prices
  - Weak / ineffective legislation / voluntary agreements
  - Low margins on small vehicles
  - Higher capital costs

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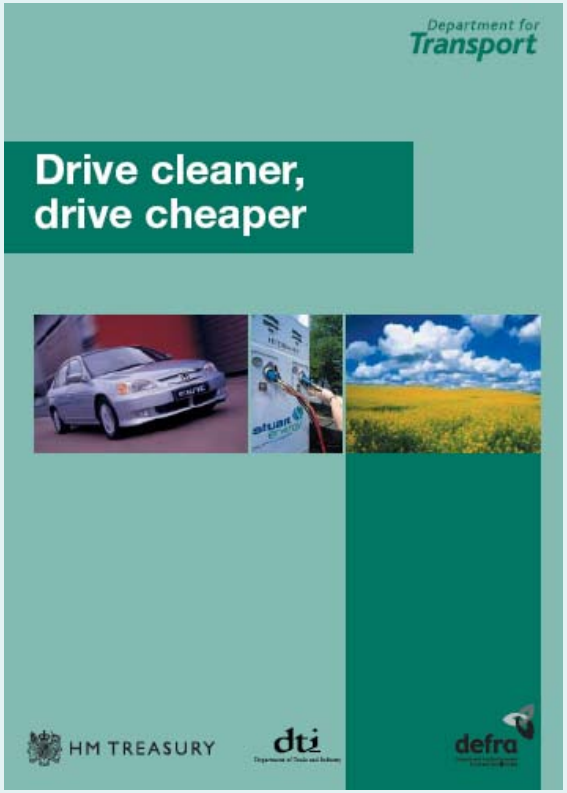
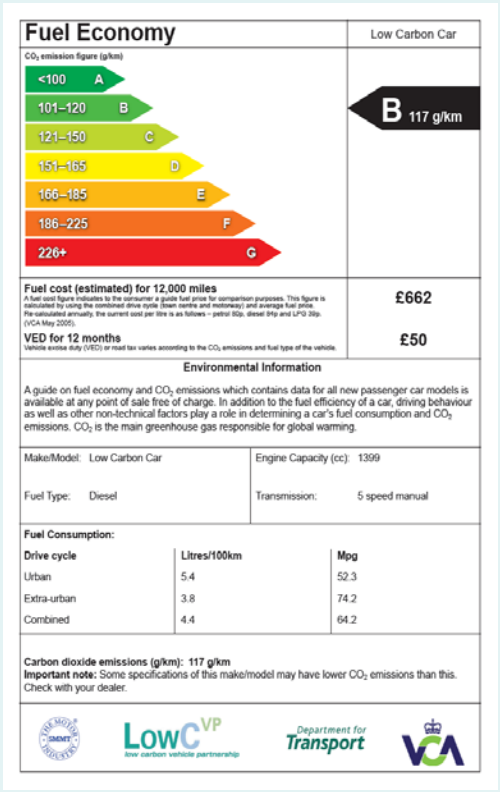
Consumer information has been significantly improved – but incentives are still inadequate

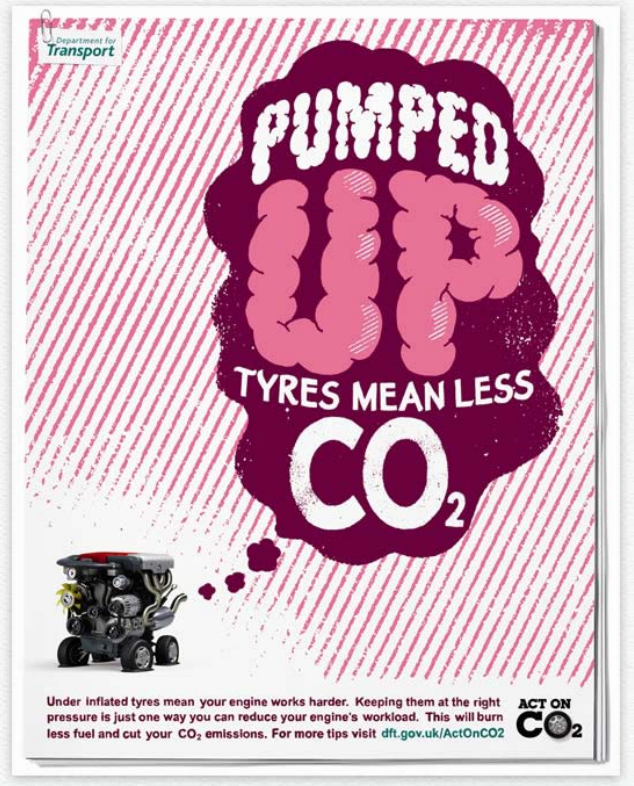
2003



2005



2007



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Biofuels can contribute to delivering GHG-savings – but indirect effects must be managed

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EVs and plug-in hybrids are a very promising technology – but will not achieve significant market share until 2020+

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Hydrogen fuel cell vehicles offer significant (but not still distant) prospects

Key challenges:

- Higher costs per unit of energy
  - Adequate price of carbon mitigation
- Supply of renewable hydrogen
- Development of refuelling infrastructure and practical storage
  - Chicken and egg supply problem
- Supply of a range of affordable vehicles
  - Fuel cell costs, durability and reliability
- Improving public acceptability
- Alternative LC-options
- RD&D funding

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Substantial new investment in encouraging road transport technology and innovation -

but there is insufficient coordination between programmes

Technology Strategy Board
Driving Innovation

CARBON TRUST

energy technologies institute

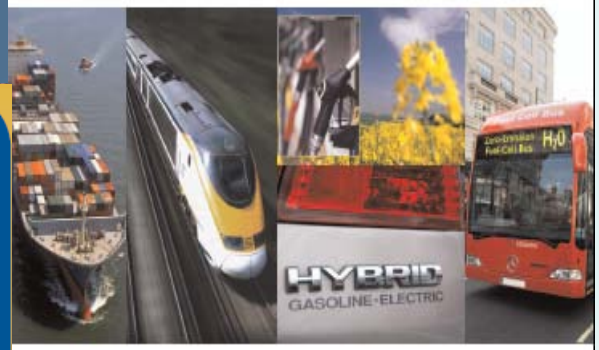
cenex

Low Carbon and Fuel Cell Technology

Knowledge Transfer Network

Department for Transport

Low Carbon Transport Innovation Strategy



May 2007

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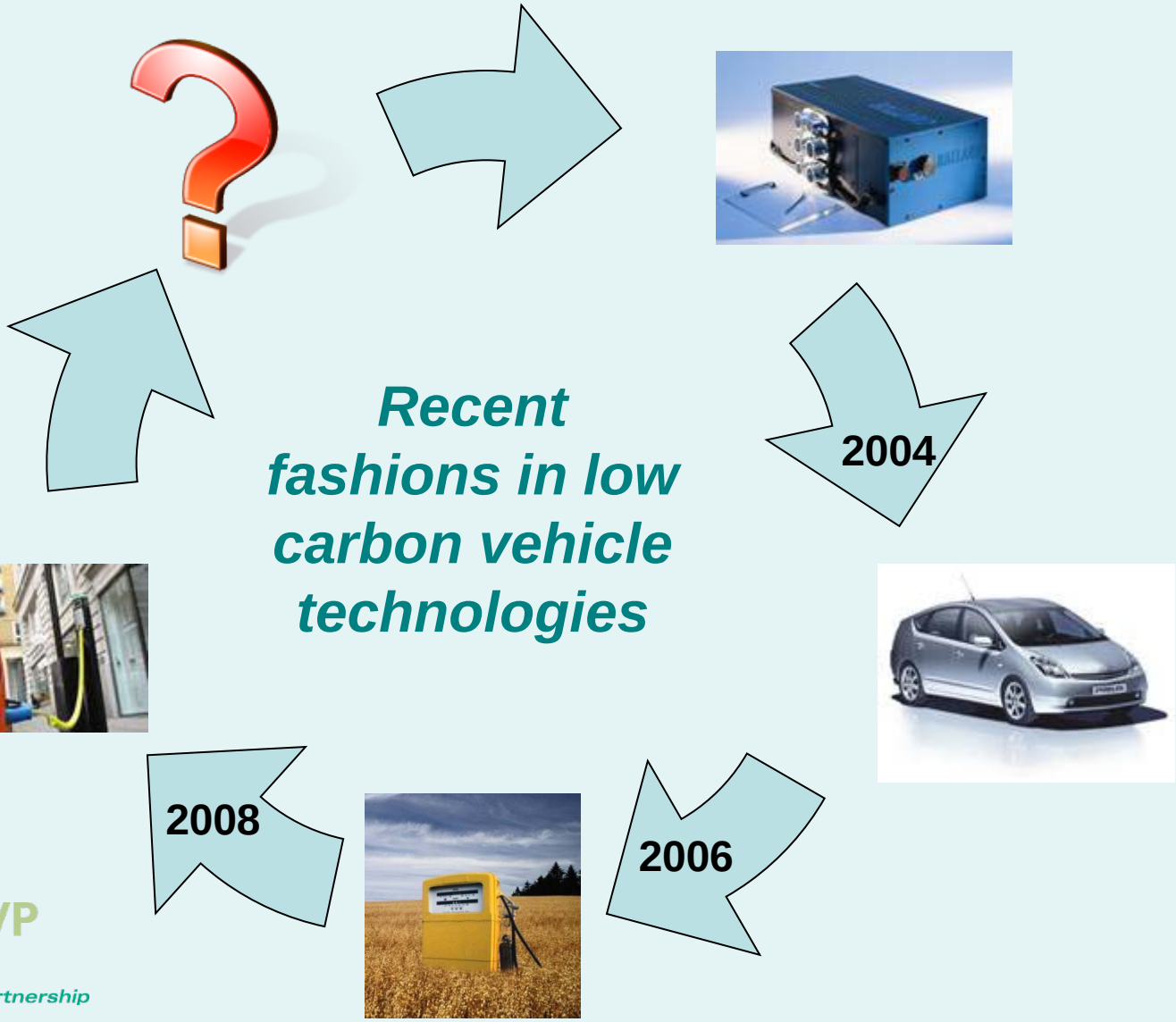
Recent history shows there are no "silver bullets"



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In the next 5-years?

Small, light-weight, efficient cheap vehicles

e.g., TATA Nano

Diesel hybrid

e.g., Citroen C4

Efficient family cars

e.g., Ford Econetic

Electric vans and gas trucks

e.g., Modec

In-use efficiency tools

e.g., Fiat Eco-drive

Conclusions

- BAU is for transport energy demand to more than double by 2050
- A halving of transport emissions is possible but hugely challenging requiring
  - An 50%+ improvement in vehicle efficiency (achievable at a cost)
  - Successful introduction of advanced biofuels avoiding indirect land use change
  - Significant market share for electric / hybrid vehicles and possibly FCVs (long-term)
- Current progress is not matching the growth in vehicle numbers
  - Faster technology deployment requires stronger consumer incentives, regulation and better consumer education
- To 2020 vehicle technology (rather than alternative fuels) will deliver most CO2 reduction
- Near-term trends are likely to be for:
  - Small efficient cheap vehicles in non-OECD countries
  - Increased demand for fuel economy in OECD countries with higher penetration of hybrids, and down-sized engines
- Technology is only part of the solution – demand management and building public transport infrastructure to encourage modal shift will be key

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Any Questions?

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