

# UK policy framework for low carbon vehicles

July 2012  
**SURGE**

**Applied Research Centre  
Sustainable Regeneration**

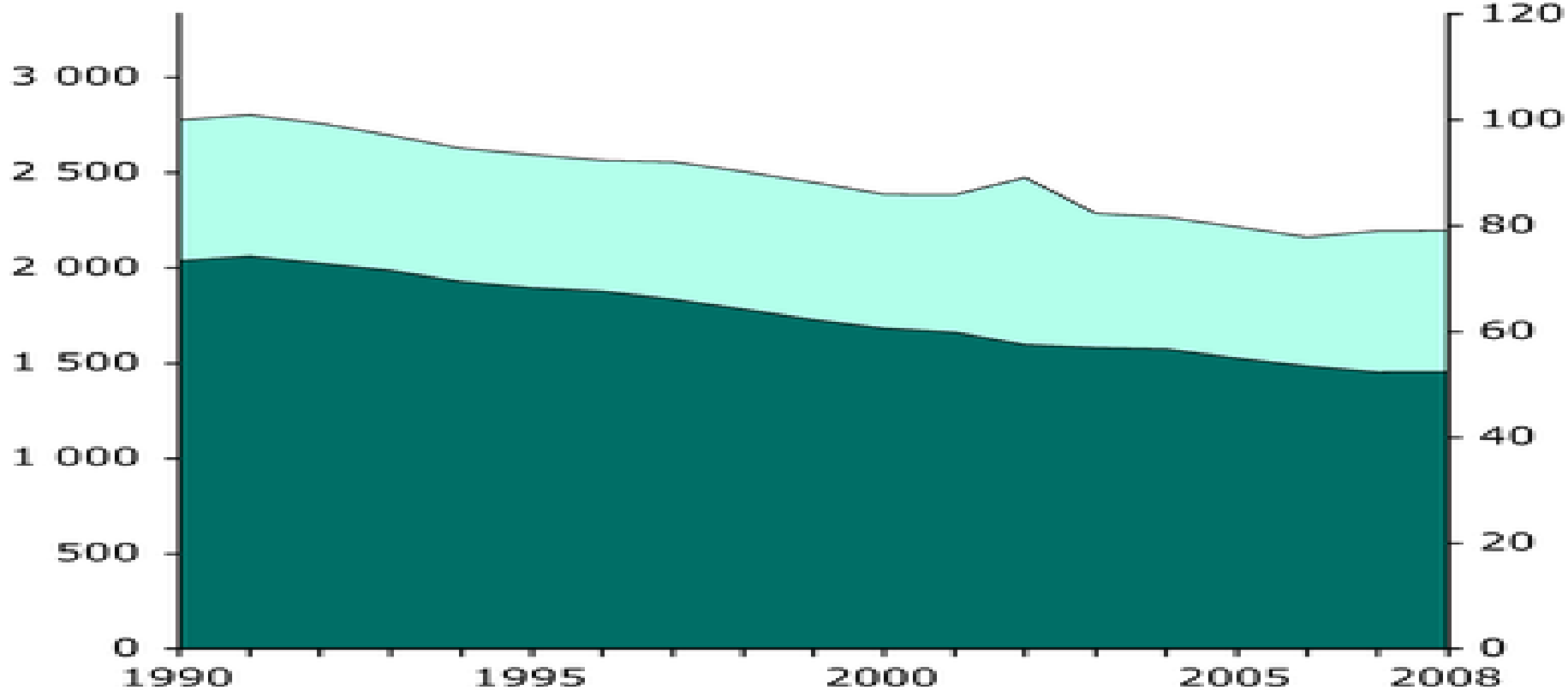


# Global drivers of Low Carbon policy - Environmental

- Challenge of de-carbonising transport networks worldwide
- Environmental and health concerns associated with tailpipe emissions from the existing vehicle fleet
  - (EU) PM10 estimated to cause 348,000 premature deaths annually (Watkiss, 2005)
- Transport accounted for 23% of all CO<sub>2</sub> emissions in 2009
  - 34% in the US
  - 26% EU
  - 6-8% China (but rising rapidly)
- Predicted demand for transport fuel will increase by 40% by 2035

Ktonnes

Index (1990 = 100)



■ Particulate matter emissions (< 2.5 μm)

■ Particulate matter emissions (2.5 - 10 μm)

# Global drivers of Low Carbon policy - Environmental

- Challenge of de-carbonising transport networks worldwide
- Environmental and health concerns associated with tailpipe emissions from the existing vehicle fleet
  - (EU) PM10 estimated to cause 348,000 premature deaths annually (2005)
- Transport accounted for 23% of all CO<sub>2</sub> emissions in 2009
  - 34% in the US
  - 26% EU
  - 6-8% China (but rising rapidly)
- Predicted demand for transport fuel will increase by 40% by 2035

# Global drivers of LCV policy – other priorities

- Resource management and energy security
  - 2001, the National Energy Policy Development Group, US; Bio-fuels in Germany since 1990s; China and Japan (MITI) promotes EVs; ProalCool Programme Brazil.
  - Importance of energy security and strategic resources.
- Sustainable economic development
  - “Applying this mode of thinking— seeing climate change through a sustainable development prism—is the only way in tackling the climate change and sharing efforts among countries.” (Streimikine)

# Global drivers of LCV policy – other priorities

- Impact on the automotive industry
  - EU No 510/2011: EC No 443/2009 – flexibility offered to automakers; US set fleet targets for 2016 allow producers bank/borrow credits; China and Japan more stringent on fuel economy and now tightening regulation;
  - producers want clear roadmap + framework
- Pressure from below
  - EU member states also driving agenda due to gap in federal policy
  - Pressure from regions and cities key driver of change in major automotive producing nations
  - California championing ZEVs – (2004) CARB + 14 states; PM10 threshold high in German cities; Chinese cities banned motorbikes - electric bike stock 37m (2006) => 50m (2010); Taiwan failed with positive E2W campaign

# UK Policy Drivers for LCVs- Environmental

- UK Climate Change Act 2008
  - ❖ Reduce carbon emissions by 50% by 2027 and 80% by 2050 (against 1990 baseline)
- EU Regulation on new car CO2 provides trajectory for low carbon vehicles and adaption of LCV technologies
  - ❖ 130g/km CO2 by 2015 and 95g/km CO2 by 2020
- Emissions from road vehicles = 22% of UK domestic CO2 (over half of this is from cars)
- Decrease in average vehicle emissions over time offset by having more cars on the road
- King Review 2007 – significant de-carbonisation of road transport is possible

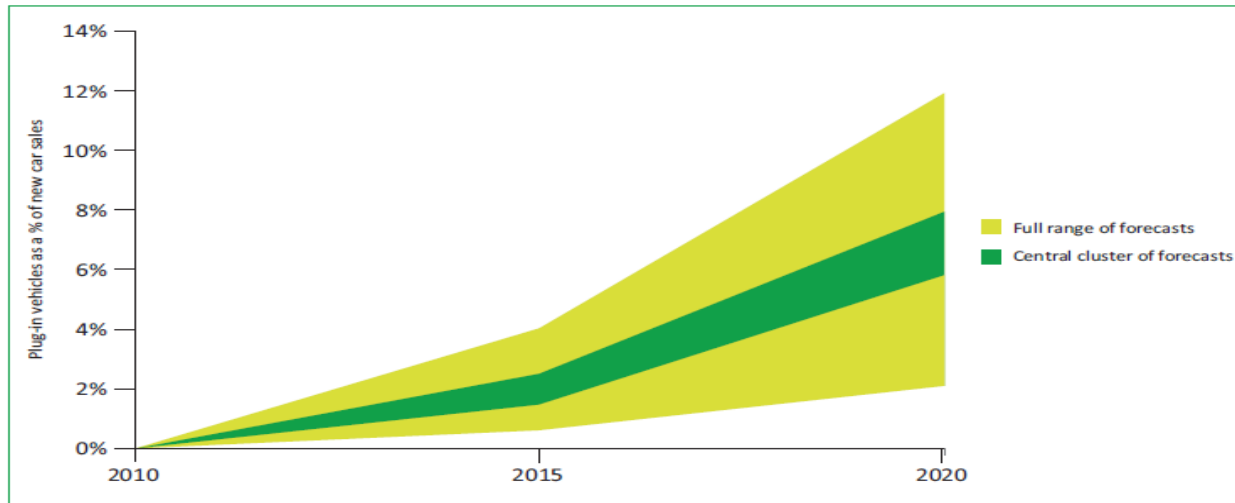
# UK Policy Drivers for LCVs - Economic

- Automotive industry worth £10.5 billion to UK economy
- Potential to enhance the sustainability and competitiveness of automotive supply chain and support continued shift to high value skills and high value engineering in automotive industry
  - build on existing strengths in the automotive sector
  - UK's comparative advantage includes technology specialisms in batteries, motors and power electronics, niche and volume vehicle manufacturing
  - UK-based infrastructure companies early movers in the market (Chargemaster, Elektromotive)
  - Opportunities in intelligent communication, links to the smart grid and billing systems.



# UK Low Carbon Vehicle Sector - Forecast

Figure 1.2 Plug-in vehicle uptake forecasts for 2015 and 2020



Source: Graph based on selected plug-in vehicle uptake forecasts by Arup-Cenex, BCG, Berger, Cheuvreux, Deutsche Bank, Frost & Sullivan and McKinsey

Source: UK Office for Low Emission Vehicles,  
*Plug-in Vehicle Infrastructure Strategy, 2011, p15*

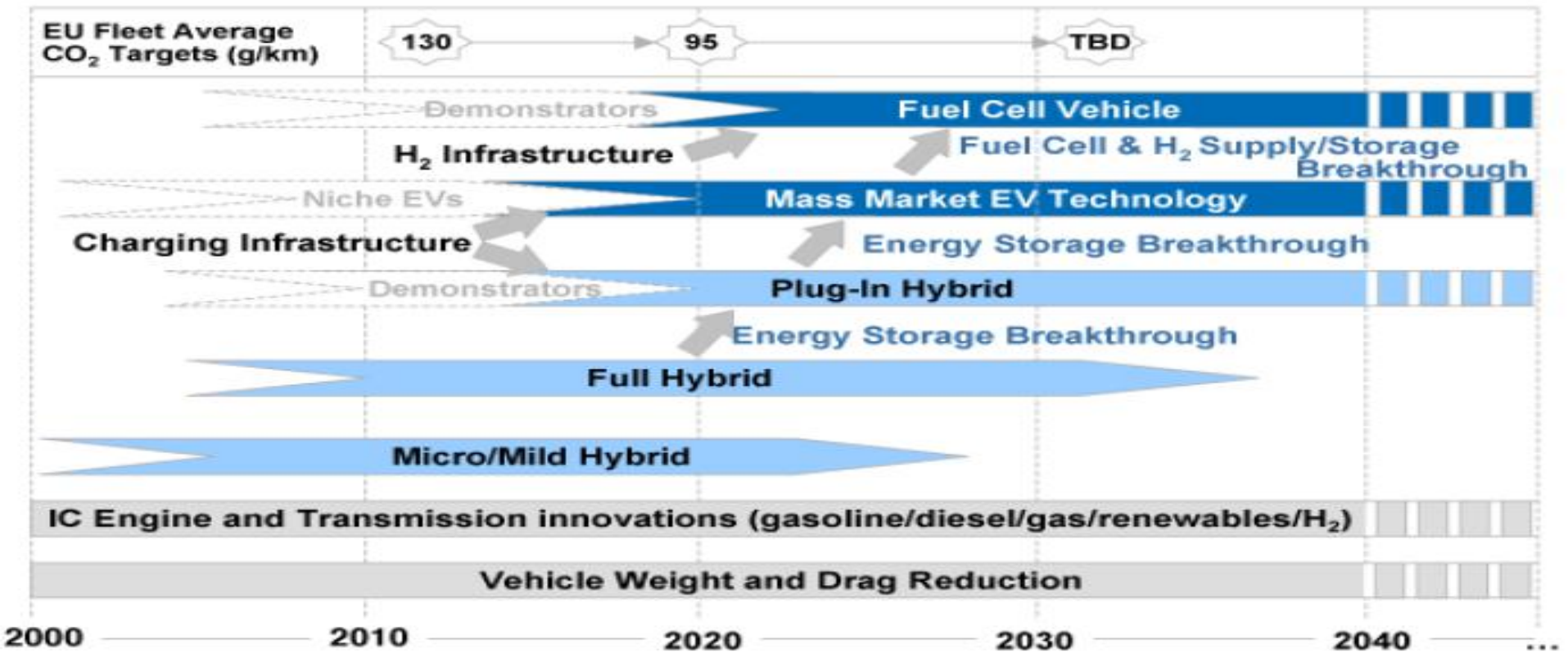
# Policy enablers for low carbon vehicles

- In 2009 a new **Office for Low Emission Vehicles (OLEV)** brought together 3 Government Departments:
  - Department for Transport (DfT)
  - Department for Business, Innovation and Skills (BIS)
  - Department for Energy and Climate Change
- Remit to provide cross-government joined-up policy direction to place UK at the forefront of ultra-low carbon vehicle development, demonstration, manufacture and use

# Policy enablers for low carbon vehicles

- Influenced by work of the **industry-led** New Automotive Innovation and Growth Team (NAIGT) which recommended establishment of...
  - Automotive Council to bringing stakeholders together to influence and shape policy
  - Centre of Excellence (CENEX) as a delivery agency to better integrate expertise and catalyse innovation in low carbon technologies
- Significant programme of initiatives (supply and demand side) with funding of approximately **£400 million** since 2009

# UK Low Carbon Vehicle Sector - Roadmap



# UK government policy initiatives – Supply side

## Vehicle trials

- Ultra-low Carbon Vehicle Demonstrator Programme (from 2009)
  - £25m funding (matched by industry) from Technology Strategy Board
  - Eight regional consortia (manufacturers, energy suppliers, local authorities and universities) trialling some 320 vehicles over a 12 month period
- Low Carbon Vehicle Public Procurement Programme
  - £20m funding to help public sector organisations purchase low carbon vans / commercial vehicles for their fleets
  - 210 electric / hybrid vans introduced through the scheme in 2010

# UK government policy initiatives – Supply side

## Infrastructure

- Plugged-in Places (2010)
  - £30m funding supports regions in meeting up to 50% of installation costs of recharging infrastructure
  - London, Milton Keynes, North East, East of England, the Midlands, Greater Manchester, Scotland and Northern Ireland
  - Programme aims to support installation of **8,500 charge points** in streets, car parks, commercial, retail and leisure facilities
  - Consortia of public authorities, energy companies and businesses
  - Act as trial locations with lessons learnt informing national policy
  - Aid inter-regional connectivity

# UK government policy initiatives – Supply side

## Research & Development

### Low Carbon Vehicles Innovation Platform

- Integrated Delivery Platform bringing together £200m funding from Technology Strategy Board, Department for Transport, Regional Development Agencies and Research Councils
- Funds collaborative research and development projects and proof-of-concept studies, bringing forward low carbon vehicle technologies that are relatively near to market
  - e.g. 2010 saw £24m awarded to vehicle manufacturers, suppliers and universities in collaborative projects developing innovative technologies such as hybrids, lightweight materials and engine optimisation



# UK government policy initiatives – demand side

## Consumer incentives to purchase

- Scrappage Incentive Scheme (2009-2010)
  - £2,000 cash incentive to trade in old car for new vehicle
- Plugged-in Car Grant (from 2011)
  - £230m to subsidise purchase of new electric vehicles
  - Up to £5,000 off purchase price (25% maximum)
  - Ten vehicles currently eligible meeting the Government requirements on performance, safety and warranty
- All vehicles with emissions less than 100g CO2 exempt from UK annual circulation tax
- All electric vehicles receive 5 year exemption from company car tax
- Local initiatives: such as exemption from central London congestion charge



# Cars eligible for UK plug-in grant



**Mitsubishi i-MEV**

**Vauxhall Ampera**

**Peugeot iOn**

**Citroen C-Zero,**

**Tata Indica**

**Nissan LEAF**

**Renault Fluence**

**Chevrolet Volt,**

**Smart fourtwo**

**Toyota Prius**

# Regional and local initiatives

- A £38m Low Carbon Vehicles Technology (LCVT) programme
  - Collaboratively funded R&D across 16 key technology platforms providing solutions in areas such as motors, batteries and aerodynamics.
- A £14.5m vehicle demonstration trial - CABLED
  - 110 electric, hybrid and hydrogen fuelled vehicles being tested by members of the public on the region's highways
- A £4.5m Niche Vehicle Research and Development programme – the Niche Vehicle Network (NVN)
  - Niche vehicle manufacturers, system suppliers, automotive technology companies and academic institutions collaborating on the application of new technologies in low-volume vehicle production
- A £6.3m Midlands Plugged-in-Places scheme
  - Installation of over 500 public charging posts – brings together energy companies, manufacturers, manufacturers, public authorities and academia

# UK policy: Good practice?

- Joined-up solutions and partnership working (financial and intellectual)
  - industry, government at all levels, R&D organisations and energy companies working together
  - Key role of the automotive industry in informing, leading and delivering solutions
  - Building on key strengths
- A range of supply and demand side stimuli
  - Infrastructure
  - R&D
  - Vehicle trials
  - Consumer incentives

# ... and elsewhere?

- US – after early pioneering work saw significant regression under Bush administration. Process driven by states. New Obama administration adopted 'All Of The Above' approach
- Germany has been slow to adopt hybrids and EVs (no subsidies), preferring clean fuel solutions. Meets EU minimum EU requirements but no concerted campaign
- Japan (MITI) intercompany knowledge networks, sponsored R&D, sponsored leasing and purchasing incentives, subsidised EV manufacture, encouraged public procurement of EVs
- French Ministry for Industry 10 point charter; Bonus/Malus feebate; *Automobile Bonus*; National plan for electrification of fleet
- China focussing on fuel economy, small car usage, graded excise duties and purchase cuts; subsidies for public fleet and agricultural vehicles

# Impact of UK Low Carbon Vehicle Policy?

- In 2010 registrations of Alternatively Fuelled Vehicles were just 1.1% of total, although...
- Substantial rise in volume of sales from 9,439 in 2009 to 22,865 in 2010 - bulk of these (98%) petrol/electric hybrids
- Electric cars bought through the plug-in car grant modest to date and declining
  - Q1 2011 – 465
  - Q2 2011 – 215
  - Q3 2011 – 106
- Significant increase in charging infrastructure
- Increased in intelligence on vehicle performance and consumer behaviour



# Why has take-up of electric vehicles been slow?

- Price
- Plug-in car grant - too small and short term
- Lack of awareness of incentives to purchase
- Lack of disincentives to purchase – ‘Feebates’
- Limited vehicle product range
- Appetite for electric vehicles linked to perception of performance/quality and current lack of awareness/evidence
- Perceived availability of supporting infrastructure
- Improvements in emissions in internal combustion engine vehicles stimulating demand for small cars