

Low Carbon Vehicle Policies & Market Development

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EV Investor Club Breakfast
K&L Gates LLP



LowCVP - accelerating a sustainable shift to lower carbon vehicles and fuels

- ❑ Conduct policy research to understand the optimal pathways to low carbon road transport and over market barriers.
- ❑ Influencing Government and other decision makers on future policy directions and optimal policy mechanisms.
- ❑ Supporting collaborative initiatives that develop the market for low carbon vehicles and fuels.
- ❑ Helping business, especially SMEs, benefit from new market opportunities

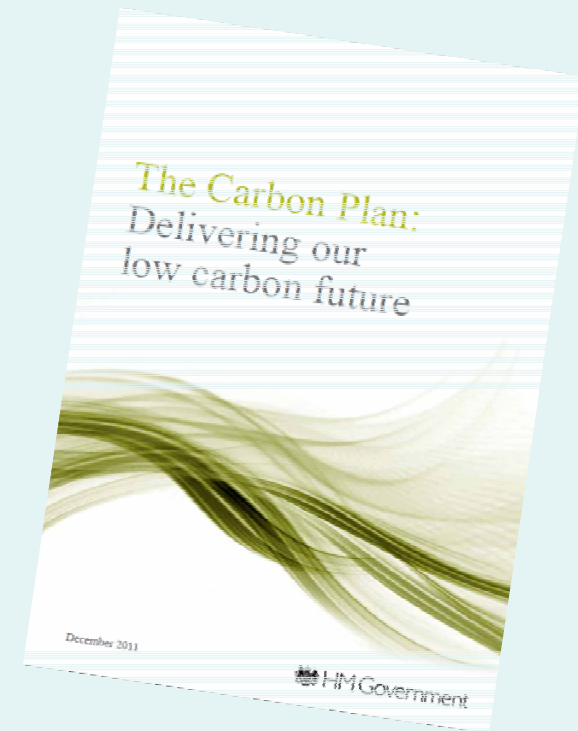


The LowCVP is an independent cross-industry and stakeholder partnership – approaching 200 members

Our expertise covers low carbon cars, vans trucks, buses and fuels.

There is growing momentum towards low carbon road transport

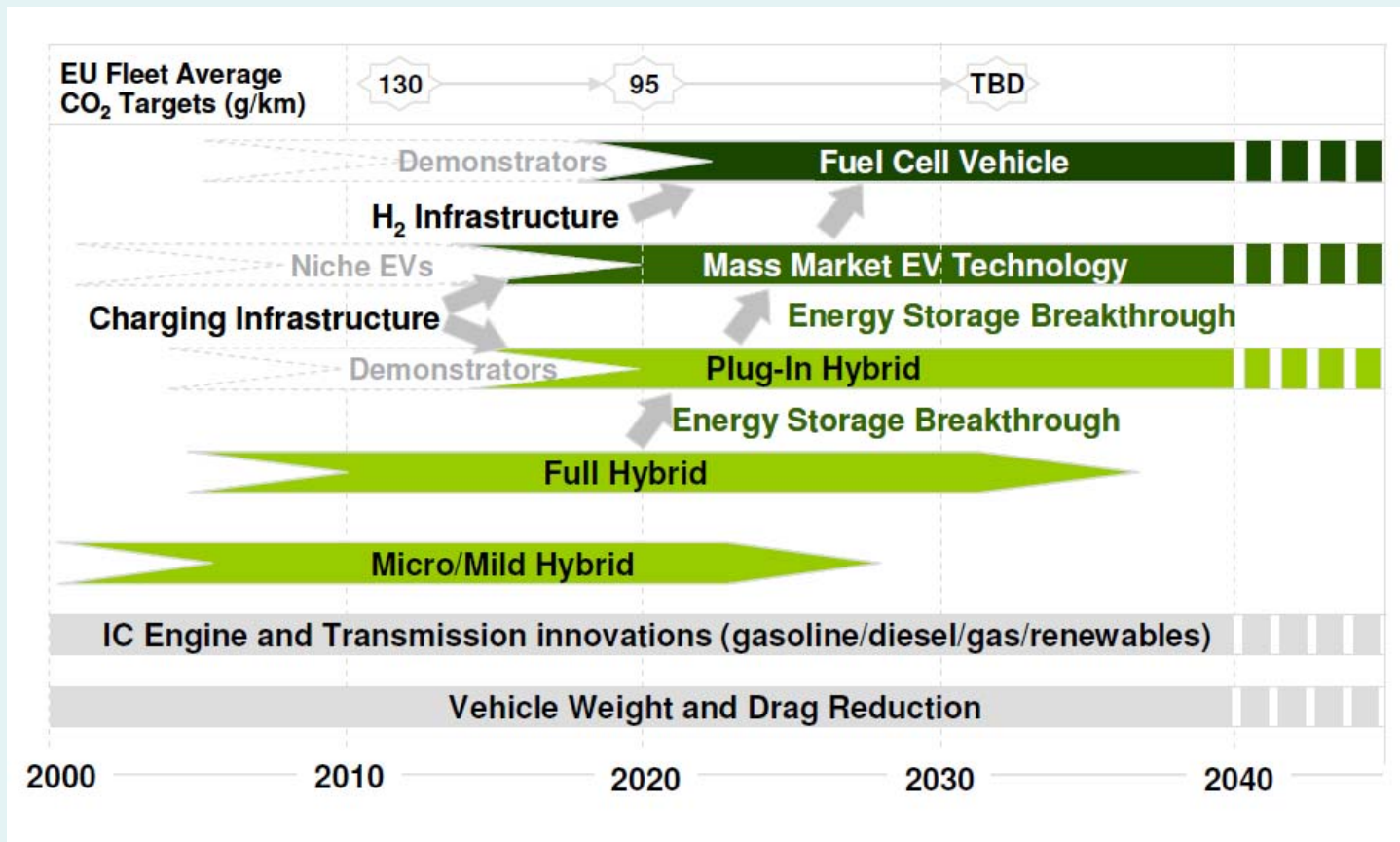
- ❑ UK Climate Change Act
34% GHG reduction by 2020, 80% GHG by 2050
- ❑ EU new car and van CO₂ emission targets 2020
Cars: 95g/km Vans: 130g/km
- ❑ Rising fuel prices
- ❑ Fuel security
- ❑ Job creation, stimulating economic growth and developing new supply chains
- ❑ Improving local air quality



Government identifies ULEV as a key mechanism to achieving GHG reductions up to 2050

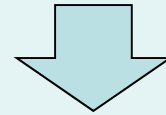
Automotive Council Technology Roadmap for Passenger Cars

Direction for UK automotive industry,
guides R&D and supply chain development



Low Carbon Vehicle & Fuels Policies & Initiatives

Climate Change Act
Compliance with EU regulations



- Funding research and development
- Strengthening ULEV supply chain
- Grants: Plug-in cars, vans, infrastructure
- Plugged-in Fleets
- UK H2 Mobility

- Fiscal incentives:
 - Reduced vehicle exercise duty
 - 100% enhanced capital allowance
 - Lower company car tax
 - Lower fuel duty

- Renewable Transport Fuel Obligation
- Green Bus Fund
- Car fuel economy labeling scheme

- Regional/Local:
 - Green Vehicle Discount - London Congestion Charge Scheme
 - Lower rate parking charges

Department for
Transport

LowC^{VP}
low carbon vehicle partnership

H2 Mobility – Phase 1 Results

- ❑ Aim: To evaluate value of FCV to UK & develop a roadmap for vehicle and road fuel
- ❑ Collaboration between automotive, energy, retail industry & Government

Key Findings

- ❑ By 2030 1.6m FCVs in UK
- ❑ By 2030 FCV cost competitive with conventional vehicles
- ❑ 65 stations across the UK sufficient to start market, 1150 by 2030
- ❑ Lifecycle CO2 emission 75% lower for FCV than diesel by 2030
- ❑ Hydrogen production 2030 – water electrolysis via renewable energy & steam reformation
- ❑ Benefits to air quality
- ❑ Opportunities for hydrogen production and retailing
- ❑ Phase 2 will create a detailed business case and delegate actions

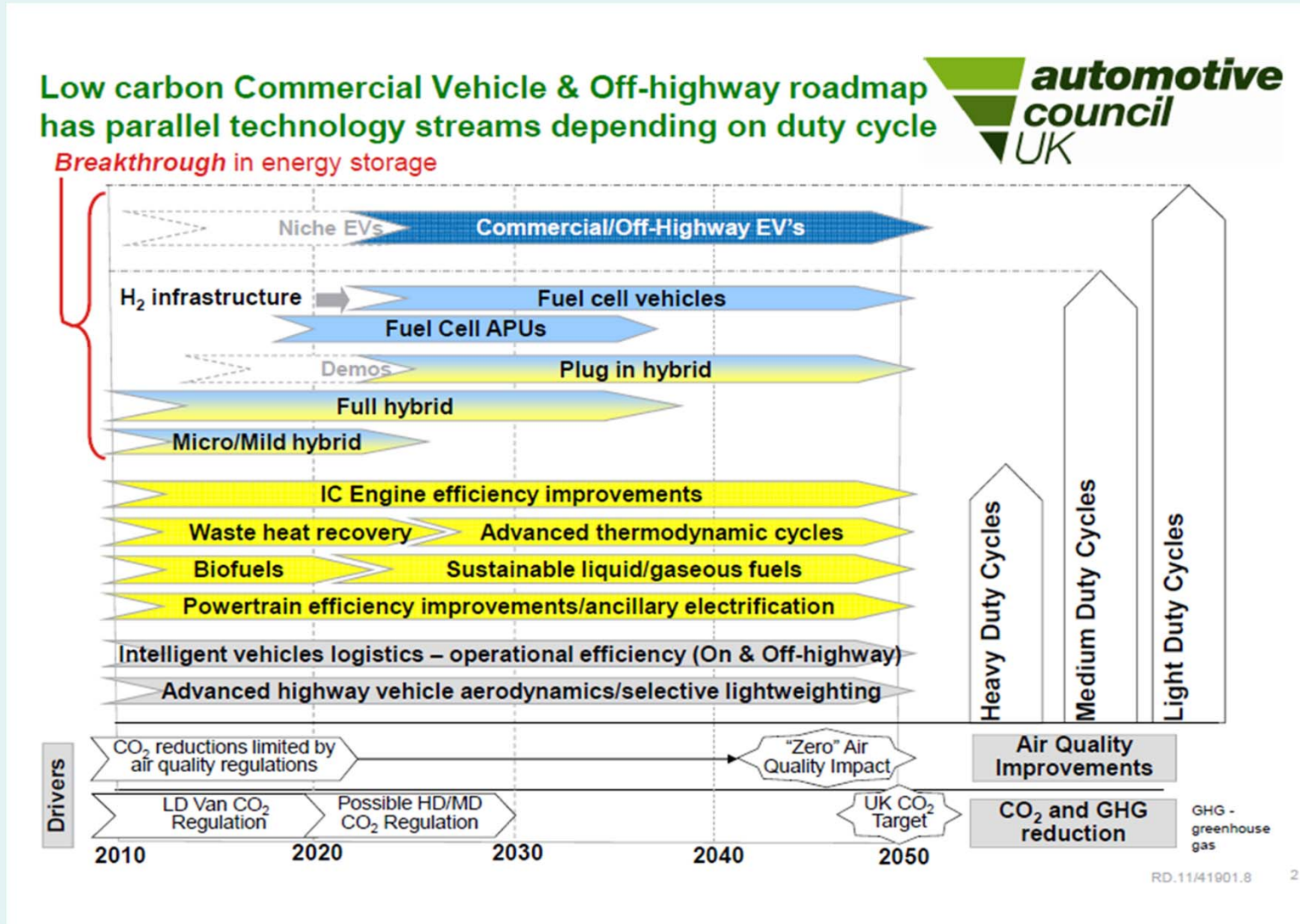
Market for biofuels in the UK and Europe is currently driven by regulation

- ❑ Biofuel volume in the UK is regulated through the Renewable Transport Fuels Obligation (RTFO).
 - 5% vol. biofuel blend by 2013/14
 - Sustainability and carbon reporting

The market for biofuels will be determined across Europe by:

- ❑ Fuel Quality Directive (FQD) obliges transport fuel suppliers to reduce life-cycle greenhouse gas emissions from transport fuel by 6% by 2020.
- ❑ The Renewable Energy Directive (RED) defines the volume of biofuels that member states have to blend in their transport fuels which by 2020 will be 10%.
- ❑ There are proposed changes to the RED to take account of indirect land-use change (iLUC): introduction of iLUC factors, incentives for advanced biofuels and 5% cap on crop-based biofuels counting toward 10% target.

Low Carbon Heavy Duty Vehicle Roadmap



Over the next two decades different vehicles/fuels are likely to be competing in each market sector

Fuel	Small car	Medium car	Large car	Light CV	Heavy CV
Biomethane				Dedicated	Dedicated & Dual Fuel
Electricity	BEV	BEV		BEV	
Biofuel	Efficient ICE + biofuels blends	H P R E H E V E E V V V	H P R E H E V E E V V V	HEV PHEV	Efficient ICE + biofuel blends
Oil				Efficient ICE + biofuels blends	
Hydrogen		HFCV	HFCV	HFCV	

In Summary

- ❑ There is no silver bullet; variety of low carbon fuels and technologies will be required for different types vehicles over the next two decades
- ❑ Strong government support for low carbon vehicles
- ❑ ULEV key role in meeting European and national CO₂ targets
- ❑ EV car market slow progress, premium cost price key challenge
- ❑ FCV market 2030; initial investment for hydrogen refueling station network, opportunity for UK supply chain
- ❑ Biofuels will provide long-term contribution to decarbonising road transport but must be produced sustainably; advanced biofuel development important
- ❑ Opportunities for decarbonising HDVs via natural gas, biomethane and in cities hybrids and small electric trucks
- ❑ Air quality should not be forgotten as a further driver of low carbon vehicles