

THE leading event in the low  
carbon transport calendar

**LowC<sup>VP</sup>**  
Low Carbon Vehicle Partnership  
**Conference 2014**

The low carbon contribution:  
Driving growth; delivering jobs

---

# Fuels Roadmap for 2020 and beyond - implications for future strategy

Celine Cluzel  
Principal Consultant  
Element Energy

**elementenergy**

Jonathan Murray  
Policy and Operations Director  
Low Carbon Vehicle Partnership

**LowC<sup>VP</sup>**  
Low Carbon Vehicle Partnership

**LowCVP has been working on fuels agenda for over 10 years.**

- Achievements include: Carbon & sustainability reporting, Renewable Transport Fuels Obligation, and Understanding of ILUC issues. All feeding directly into UK and EU policy development

**Currently work is focused on developing consensus around future fuels.**

- LowCVP commissioned **Element Energy Limited** to produce two reports:
  - Renewable Energy Directive Scenarios – how to comply with transport target
  - Fuels Roadmap – road transport fuels delivering carbon reductions to 2030
  - Reports are available on the LowCVP website

**The reports were published in June and have been disseminated and welcomed in the UK and Internationally**

# There is currently no defined strategy to reach the 10% RED target or for fuels beyond 2020.

## RTFO: Mechanism to incentivise blending of biofuels

- Reporting of GHG emissions; successful shift to 'cleaner' biofuels.
- Double counting for waste derived introduced in 2009/10
- Target set at 4.75% for 2014 and currently no increase announced i.e. no pathway to 10%

## Gallagher review 2008 – highlighted impact of ILUC

- EC proposal to handle ILUC 2014

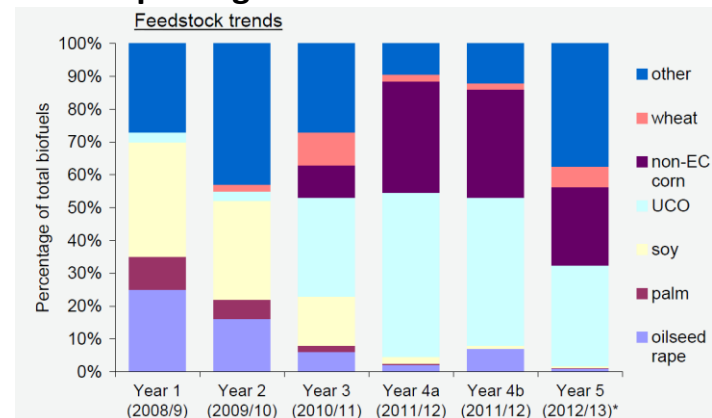
## Bioenergy Strategy 2012 (DECC/DfT/DEFRA):

- Bioenergy contribution of 8-11% of UK energy demand in 2020, around 12% by 2050
- Transport is one of most cost-effective uses of biomass.
- But no implementation plan defined

## 2013-14 DfT call for evidence on advanced fuels:

- what fuels should be supported, how 'advanced fuels' should be defined, what support mechanisms, etc.

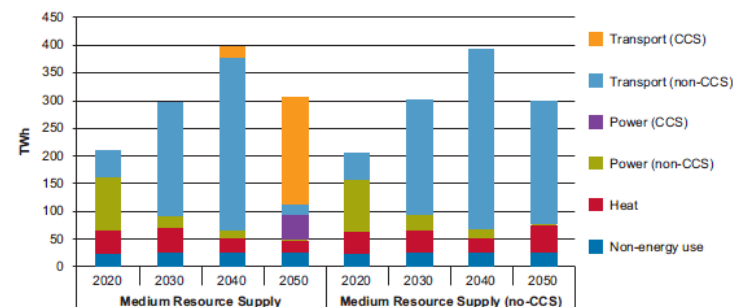
## RTFO reporting



UCO: Used Cooking Oil

## Cost effective use of biomass

Figure 7: Biomass deployment for primary energy under medium feedstock availability scenario with and without CCS (TWh / year)



Source: DECC analysis based on Redpoint

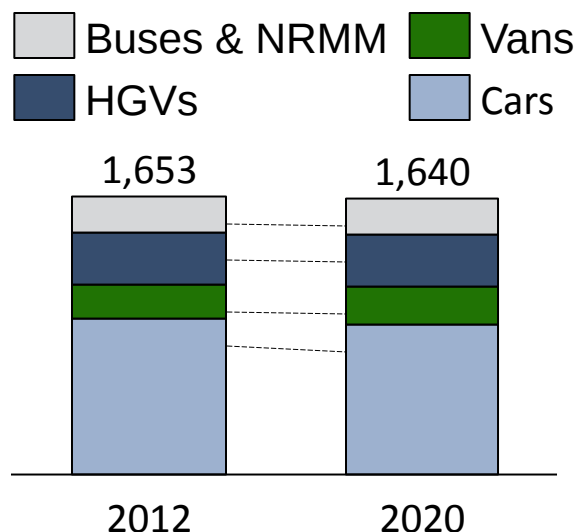
CCS: Carbon Capture and Storage

# Contents

- 
- Meeting the 2020 RED target
  - Beyond 2020: the UK Road Fuels Roadmap to 2030
  - Conclusions and next steps
-

# 10% of renewable energy in road transport in 2020 will represent c. 160PJ, i.e. 3 times more than we currently blend in road fuels

## Energy use in UK, PJ



## Multiple counting of fuels

Current factor (proposed)

- Used Cooking Oil X 2 (2)
- Biogas X 2 (2)
- Electricity X 2.5 (5)
- Used Cooking Oil X 2 (2)

2013

- Thanks to the Renewable Transport Fuel Obligation, **1.3 billion litres** of renewable fuels were blended (3.4%vol, 2.9%energy)

2020

- The Renewable Energy Directive (RED) 10% transport target will call for **164PJ of renewable energy, equivalent to 4.5 billion litres of diesel**

## Opportunities

- Multiple counting of some fuels
- E10, B7: fuel standard in place, stock compatibility
- Depot refuelling for HGVs, buses

## Criteria & constraints – non exhaustive list

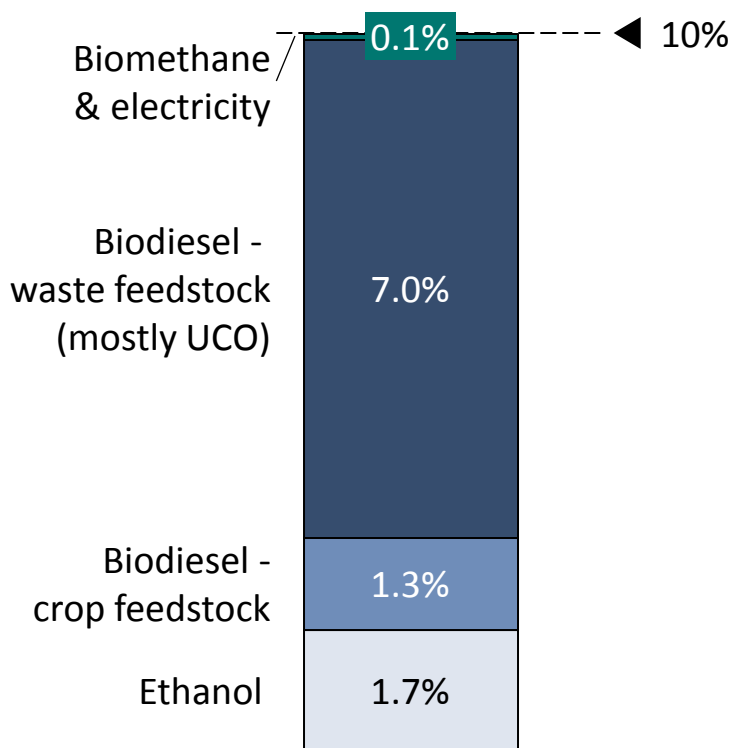
- Cost effectiveness, emission reduction
- Feasibility: timeframe, vehicles, infrastructure, fuel specification, consumer acceptance
- Renewable energy supply and commercial readiness

Source: *Options and recommendations to meet the RED transport target*, June 2014, Element Energy for the LowCVP

# Introducing E10, blending up to B7 and maximising the use of double counting low ILUC fuels was found to be the best approach

## Contribution to RED target in 2020 – recommended scenario

### % renewable energy in road transport



Most pragmatic approach for the UK and other Member States to reach the RED target:

- **Roll out E10** – experience shows it requires a public information campaign
- **Increase B7 blend to maximum and maximise the use of double counting fuels**
  - High reliance on Used Cooking Oil (UCO): 1.7 billion litres (50% of EU production potential)
- Introduce a framework to **support drop-fuels and ethanol 2G** as they:
  - Offer a better prospect to decrease emissions
  - Displace/make up for supply shortfall of UCO feedstock
- Support for other multiple-counting options (**electric vehicles and bio-methane**) to reduce reliance on UCO
  - Limited contribution by 2020 due to stock turnover, low share of renewable electricity and competition with heat sector

Source: *Options and recommendations to meet the RED transport target*, June 2014, Element Energy for the LowCVP

# Contents

- 
- Meeting the 2020 RED target
  - Beyond 2020: the UK Road Fuels Roadmap to 2030
  - Conclusions and next steps
-

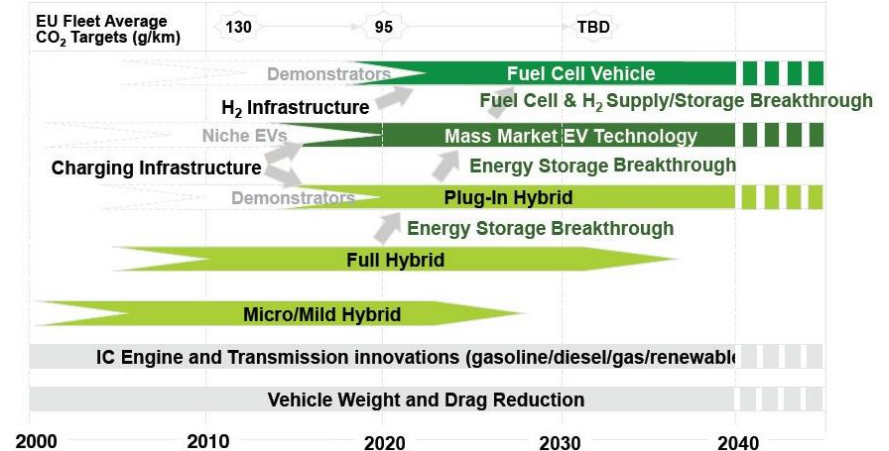
# Criteria for building the fuel roadmap for the UK to 2030: consistency with powertrain roadmaps & RED target and fuel supply constraints

- The road transport fuel roadmap must:

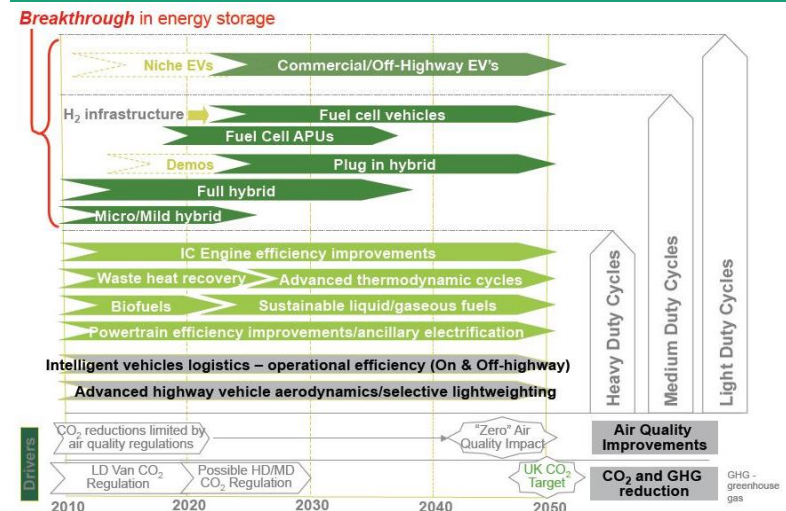
- 1 Align the **existing powertrain roadmaps** and be consistent with their underlying drivers, namely the EU and UK level emission targets
- 2 Be consistent with the **RED 2020 target**
- 3 Be consistent with **supply constraints**
- 4 Take into account the **industry stakeholders' feedback** and the lessons learnt from other published energy system analysis/ fuel roadmaps

Source: *Road transport Fuels Roadmap for the UK*, June 2014, Element Energy for the LowCVP

## Passenger cars roadmap Source: Auto Council



## Commercial & Off Road Source: Auto Council



### ③ Supply considerations indicate a move to E20 is possible & a potential for gas, pending on pathway that brings WTW emissions benefits

#### Liquid fuels

- Conclusions from study of biofuels supply potential at EU level (bottom-up approach):
  - **Enough sustainable ethanol supply** for a move to E35 (but E20 recommended when considering the needed vehicle and infrastructure modifications)
  - The supply of sustainable biodiesel and economics of vehicle/infrastructure modifications **do not justify going beyond B7**

#### Gaseous fuels

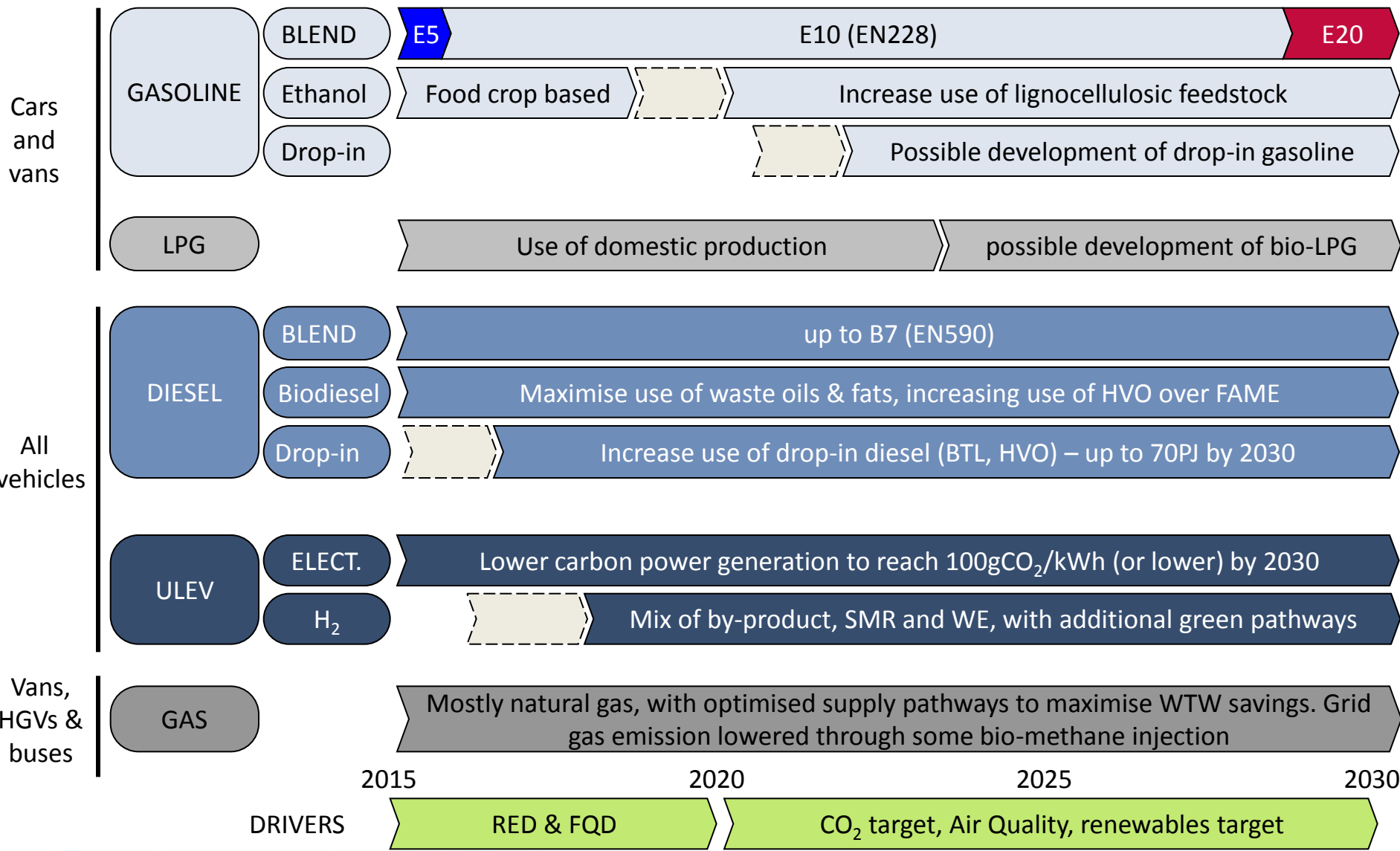
|             | WTW savings vs. diesel | Supply                              | Comments                                                                                       |
|-------------|------------------------|-------------------------------------|------------------------------------------------------------------------------------------------|
| Bio-methane | 70 to 146%             | 32TWh in 2030                       | Represents: c. 5% of the total 2030 UK gas demand; <10% of 2020 energy use from road transport |
| Natural gas | -16 to 23%             | >50 years of global proven reserves | There are various opportunities to reduce natural gas WTW emissions                            |

#### ULEV

- Electricity: substantial investment in power transmission and distribution upgrade will be needed to accommodate increased demand (EVs, heat pumps) & decarbonise the grid
- Hydrogen: investment needed to green production and for distribution infrastructure

Source: *Road transport Fuels Roadmap for the UK*, June 2014, Element Energy for the LowCVP

# The developed roadmap covers all road vehicles and identify key milestones for each energy vector type



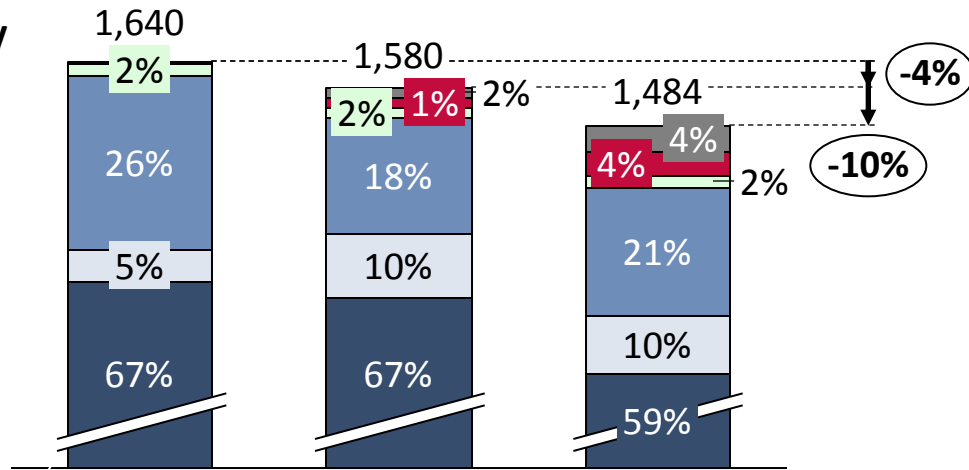
# Roadmaps show potential to reduce GHG emissions by 20% WTW between 2020 and 2030, and double renewable energy share

## Illustrative impact of the fuel roadmap



**Total energy use, PJ**

[Cars, Vans, HGVs, Buses, NRMMS]



-4%  
-10%

2020

2030

2030 - High uptake of alternative fuel vehicles

Renewable energy, %

6%

12%

13%

WTW emissions, Mt

134

120

110

- Combination of powertrain roadmaps and fuel roadmap will deliver reduction of emissions:
  - Improvement in the fleet energy efficiency: total energy use decrease, by 4 to 10% between 2020 and 2030 (depending on powertrain technology uptake)
  - Increasing use of biofuels, gas and grid decarbonisation
- By 2030, FAME, drop-in diesel and ethanol still providing the most of the renewable energy due to dominance of petrol and diesel vehicles

# Contents

---

- Meeting the 2020 RED target
  - Beyond 2020: the UK Road Fuels Roadmap to 2030
  - Conclusions and next steps
-

# Conclusions from the Fuels Roadmap

## **Meeting the RED transport target will be difficult but possible**

- Roll out E10 and increase the biodiesel blending up to B7 blend wall.
- Maximise the use of double counting fuels that do not use food crop feedstocks.
- UK will need to maximise the take-up of alternatives and advanced fuels.

## **Post 2020 there is scope to significantly reduce carbon emissions and increase renewables in road transport fuels through “advanced biofuels”**

- The deployment of E20 gasoline in late 2020s.
- Development of drop-in fuels for both gasoline and diesel **needs a framework for investment now.**

## **There will be an increasing role for alternative fuels**

- The role of electric and hydrogen powered vehicles will be dependent on the level of renewable energy sources.
- Methane and biomethane have a role in road transport but a dedicated gas strategy is required, and LPG has a continuing role.

**Need to establish a wider consensus on the way forward in order to be politically acceptable and commercially sustainable.**

# Developing an environmental and industrial strategy for fuels

## What should be the objectives for 2030 and trajectories to 2020?

- Development of policy will require commercial and societal support.
- EU proposals on ILUC and review of RTFO provides an opportunity to reshape policy.
- Requires broad stakeholder engagement and a willingness to tackle problems.

## What mechanisms will successfully deliver the RED target?

- A coherent package of measures will be required to deploy fuels in volume on time.
- Need to develop a firm set of proposals/specific policies, with timelines, identifying risks and options for mitigating them.

## What infrastructure will we need and when?

- A consensus view of the infrastructure requirements and time frames required to support ultra-low carbon vehicles and fuels is needed.
- What measures are required to ensure the infrastructure is deployed for liquid and gaseous fuels, and electricity for transport energy.

**Align low carbon ambition with a UK growth agenda for 2030.**

**Inform Advanced Fuels strategy and RTFO trajectory for 2020.**

# Thank you for your attention.

Celine Cluzel  
Principal Consultant  
Element Energy

**elementenergy**

Jonathan Murray  
Policy and Operations Director  
Low Carbon Vehicle Partnership

**LowC<sup>VP</sup>**  
Low Carbon Vehicle Partnership

LowCVP Conference 2014  
The low carbon contribution:  
Driving growth; delivering jobs

**elementenergy** **LowC<sup>VP</sup>**  
Low Carbon Vehicle Partnership