



RENEWABLE ENERGY ASSOCIATION

Low CVP Conference 2017

Cities in Motion: Tackling Climate
and Pollution Challenge

*Moving freight in future:
The prospects for renewable fuels*

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GROWING THE RENEWABLE ENERGY & CLEAN TECHNOLOGY ECONOMY



Established in 2001: We are unique, in that:

- Largest trade association (> 600 members)
- Members of all sizes – sole traders to multinationals, with a democratic, *one member one vote* structure
- Cover all renewable technologies, their supply chains and service industries
- Industry coverage includes waste via our composting group (ORG)
- Activities include lobbying, policy development, information dissemination and promoting the renewable energy sector

Renewable transport sector jobs 10K renewable transport fuel + 6K in
EVS

Introduction to the REA

- The REA has been leading on renewable fuels - liquid and gaseous - since 2006.
- Our Renewable Transport Fuels Group has over 90 members and has helped to shape renewable transport policy over the years.
- On Friday we launch our new EV Group to take the REA to the next stage in low emissions – carbon and air quality.
- Builds on our expertise in renewable energy, energy storage and energy markets.



Low carbon and cleaner air



- De-carbonisation should be hand-in-hand with improvements in air quality.
- Nowhere more important than in our major cities like London – and other proposed Clean Air Zones (CAZ)
- According to the Committee on Climate Change, TRANSPORT is now the UK's biggest emitter of carbon.
- The UK's appalling record on air quality already well-documented.
- Go Ultra Low Cities trialling different incentives.



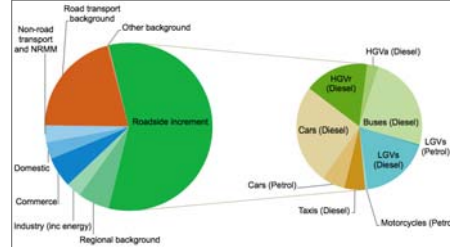
Whilst the focus on reducing carbon from (especially) 'light' vehicles (cars and light commercial vehicles) put a focus on diesel over the last 15-20 years, the air quality agenda is now more acute in cities. We can now address both.

Go Ultra Low Cities: £40m to Bristol, MK, Nottingham-Derby, London.

Incentives including access to bus lanes (and High Occupancy Vehicle lanes: 'car pool' lanes) Parking and charging incentives for EVs

Freight in perspective

- Very broadly in urban areas – assuming Euro 6/VI are fully implemented – we see e.g. NOx:
 - 63% - cars and taxis
 - 25% - vans
 - 7% - HGVs
 - 3% - buses
- So, HGVs and buses have a part to play, but the big prize is passenger cars and vans
- This is in line with the Mayor of London's draft Transport Strategy – published 21 June: proposed Zero Emission Zones by 2025.



With fleet vehicles' lives generally extending, choices made soon will impact on use in 2025.

Graphic taken from the Defra/DfT Air Quality Consultation document, specifically for the London 'roadside increment' – assume other cities similar. Blue=vans. HGVr significant. HGVa insignificant.

The REA's response (Matt) to the AQ consultation also suggested that Zero Emission Zones should be introduced prior to the Mayor's strategy.

Policy Exchange report YESTERDAY

NOTE: We recommended zero emissions zones in the Consultation Response UK Air Quality plan for tackling nitrogen dioxides

What are the fuel options for *freight*?

NOW

- **Diesel** dominates – especially HGVs and vans
- Euro VI will reduce NOx/PM for heavy vehicles
- Vans remain a challenge

FUEL SUBSTITUTION

- **Non-fossil alternative liquid fuels** – waste-based.
- **Gas (CNG)** and biomethane (factory produced vehicles)

FUTURE VEHICLES

- **Electric** – Air Quality and (potentially) low carbon.
- **Hybrids** – especially plug-in & suited to duty cycle.
- **Hydrogen** – but must consider overall efficiency.



Just hit 100,000 PHEVs out 38 million!

Fuel substitution for existing vehicles and vehicles with heavy duty cycles...operationally difficult for EV drive at the moment.

PHEV van could offer flexibility and 'Zero Emission Mode' running in urban centres, controlled by the driver or GPS.

"Potentially" low carbon to introduce / reinforce the sourcing of energy.

Hydrogen Fuel Cell Vehicles (H2 FCVs) ARE Electric Vehicles but with principal energy storage being hydrogen. Overall efficiency lower and range / cost an issue. Potential for hydrogen production where grid is constrained otherwise. But is that a 'sticking plaster'?

Electric vehicles

June 2017: 100,000 ULEV registrations.
Currently <5% Light Commercial Vehicles (LCVs)
Increasing proportion *are* PHEV cars but
'full EV' is improving with better batteries:
40-60kWh will soon be normal.

COMING SOON:

- Better range: 120+ real miles
- Larger EV vans (e.g. Renault in 2018)
- Electric or Range-extended Electric / PHEV:

Good option for vans and smaller trucks if duty cycle known

- Technology to monitor EV/ICE mode – Geo-fencing?
- Large trucks – technology more difficult/expensive
– worth it with Euro VI?



June 2017 saw the 100,000th OLEV Plug-In Car Grant (PICG) / Plug-in Van Grant (PIVG) but very few Light Commercial Vehicles in use.

Plug-in Hybrid LCV trial (Ford) is interesting – although it sounds like it's a Range-Extender EV!

The current terminology being used by Ford seems to be non-standard. The Transit project seems to be a Range Extended vehicle (EV with a generator when needed) but the call it a PHEV which is typically used to mean a vehicle (car) with a mixed drivetrain of electric and engine: i.e. the engine can drive the wheels.

ICE=Internal Combustion Engine

Most current generation EV CARS are sub 30 kWh (except Tesla) Newer vehicle tech more acceptable so expect growth in 'full EV' market.

Renault Master "ZE" (Zero Emission) with a 33 kWh battery, follows the smaller Kangoo ZE which gets an upgrade from 22 kWh to 33 kWh in same size. (Real world range of around 120 miles)

Master ZE range probably around 100 miles in city use but aimed squarely at predictable municipal uses, local deliveries etc. Volume more important than weight for increasing volume of parcels and online shopping (e.g. Amazon)

Some vehicles (not these vehicles) also feature Rapid Charging which can be attractive to fleets from a security perspective, although infrastructure (private or public) is needed too. Needs economy of scale.

Duty cycles on a depot based vehicle are generally very predictable.

Geo-fencing: using tech such as GPS to automatically control the running of the engine to avoid running in Zero Emission Zones.

Gases and Alternative Liquid Fuels

Compressed Natural Gas (CNG)/Biomethane

- Low carbon and lower NOx
- Good option across freight
- Mass balance now allows grid gas with biomethane injected
- More vehicles now coming on the market

Alternative liquid fuels

- **HVO** – drop-in or pure - good carbon savings and air quality benefits
- **Advanced biodiesels** based on waste – benefits beyond Euro VI need assessment

Hydrogen

- Limited for urban freight applications but may be more useful in 2030-2050 timeframe for long-distance?



CNG vehicles have been factory available from some manufacturers (e.g. Mercedes-Benz) for years. Little demand from the UK.

HVO = Hydrated Vegetable Oil

NOTE - Bioethanol NOT a consideration

Non-fuel options

- Urban consolidation (final mile deliveries) *have they reached maximum efficiency?*
e.g. Bristol/Bath area via

DHL: <https://travelwest.info/freight-consolidation>



- Cross-company/authority collaboration
- Off-peak or night time deliveries – technology could offer ways forward, especially on noise
- Driver behaviour and training.



Clare: I'm not sure what the message here is about maximum efficiency? I'm not sure how widespread they are?
Bristol/Bath area project using DHL to provide a distribution hub from Avonmouth for businesses in areas with traffic restrictions to receive their deliveries via a consolidation hub.
Support by Local Authorities.



THANK YOU

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