Ultra-Low Emission Commercial Vehicles

Near Term Options for Fleet Operators

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- Business case for adopting ULEVs
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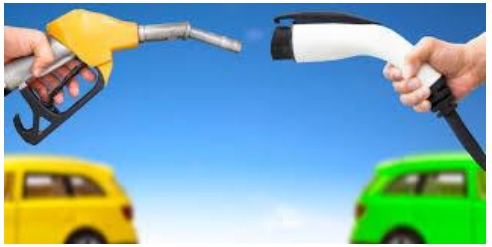


ULEV Definition

‘A car or van that emits less than 75 grams of CO_2 from the tailpipe per kilometer’

- Expected to be lowered to 50 grams of CO_2 per km from ~2021
- Definition of an Ultra-Low Emission Truck (ULET) in development by LowCVP

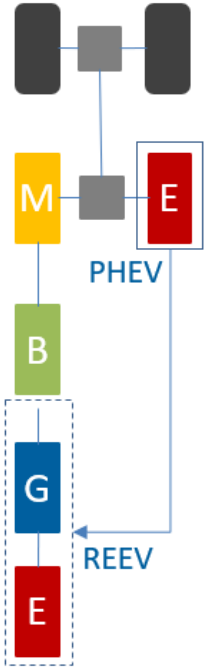
Ultra-Low Emission Commercial Vehicles

ULEV Technologies

Plug-in Hybrid and Range Extended Electric Vehicles (PHEV and REEV)	Battery Electric Vehicle (BEV)	Fuel Cell Electric Vehicle (FCEV)
		
		

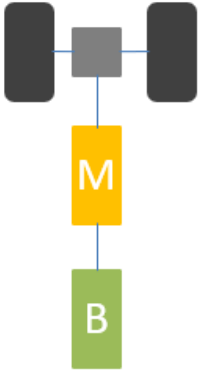
ULEV Technologies

Plug-in Hybrid and Range Extended Electric Vehicles (PHEV and REEV)



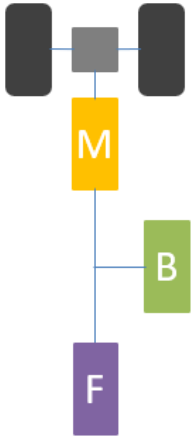
- ✓ Zero tailpipe emissions in EV mode
- ✓ Can continue to operate when the battery is empty
- ✗ Needs to be plugged in to get cost and emissions savings

Battery Electric Vehicle (BEV)



- ✓ Zero tailpipe emissions and noise
- ✓ Lower maintenance
- ✓ High torque, smooth ride
- ✗ Charging considerations
- ✗ kWh per kg can limit range and payload

Fuel Cell Electric Vehicle (FCEV)

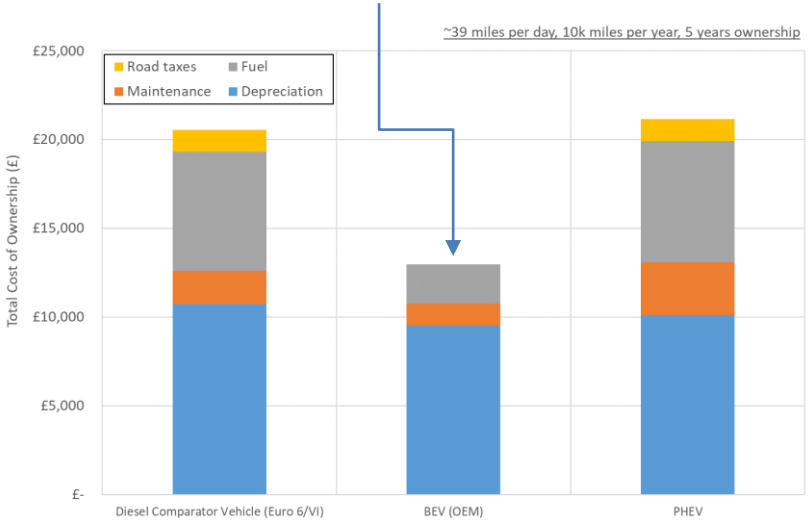


- ✓ Zero tailpipe emissions and noise
- ✓ Similar range and refuelling time compared to existing vehicles
- ✗ Low market maturity
- ✗ Currently uneconomical without additional funding

Ultra-Low Emission Commercial Vehicles

Small Vans - OEM

- ~£20k exc VAT, inc PiVG (20% up to £8k)
- Approx. real world range of 95 miles (33 kWh, Urban)
- Charging times from ~0.5h (rapid) to ~8h (fast)
- Payload up to ~700 kg
- Zero tailpipe emissions, >60% reduction in fuel lifecycle CO_2 emissions (BEV)



Make and Model (Future Release)	Drivetrain	Electric Range
Nissan e-NV200	40 kWh (BEV)	174 miles (NEDC) 124 miles (WLTP)
Renault Kangoo Z.E.	33 kWh (BEV)	170 miles (NEDC)
Citroen Berlingo Electric	22.5 kWh (BEV)	106 miles (NEDC)
Peugeot Partner Electric	22.5 kWh (BEV)	106 miles (NEDC)
VW e-Caddy (2019)	38.8 kWh (BEV)	160 miles (NEDC)
LDV EV30 (2020)	35-53 kWh (BEV)	127-200 miles (OEM)
Mitsubishi Outlander Commercial	13.8 kWh (Petrol PHEV)	28 miles (WLTP)

Ultra-Low Emission Commercial Vehicles

Medium Vans – Customer Trials

- Pricing and real world capabilities TBD
- Charging times from ~0.75h (rapid) to ~10h (fast)
- Payload up to ~1,200 kg
- Zero tailpipe emissions (in EV mode)

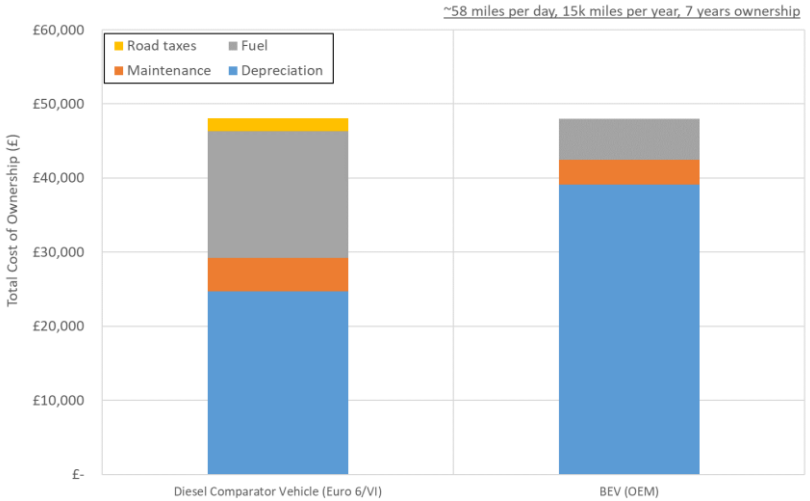
- Market Status
- DPD has taken delivery of 10 Mercedes eVito vans for last mile deliveries in Westminster
- Mercedes expects to supply ~350 eVito vans to fleet customers in 2019
- 12 month trial of 20 Ford Transit Custom PHEV vans in London supported by TfL
  - TfL reported that 34% of their total distance driven was complete on electric

Make and Model (Future Release)	Drivetrain	Electric Range
Mercedes-Benz eVito (2019)	41 kWh (BEV)	93 miles (OEM)
VW e-Transporter (2020)	38.8-77.6 kWh (BEV)	134-250 miles (NEDC)
Ford Transit Custom PHEV (2019)	14 kWh (Petrol BEV)	31 miles (OEM)

Ultra-Low Emission Commercial Vehicles

Large Vans - OEM

- From ~£47k exc VAT, inc PiVG (20% up to £8k)
- Approx. real world range of 81 miles (33 kWh, Urban)
- Charging times from ~1.5h (rapid) to ~10h (fast)
- Payload of ~1,100 kg, maximum of ~1,700 kg
- Zero tailpipe emissions, >60% reduction in fuel lifecycle CO_2 emissions (BEV)

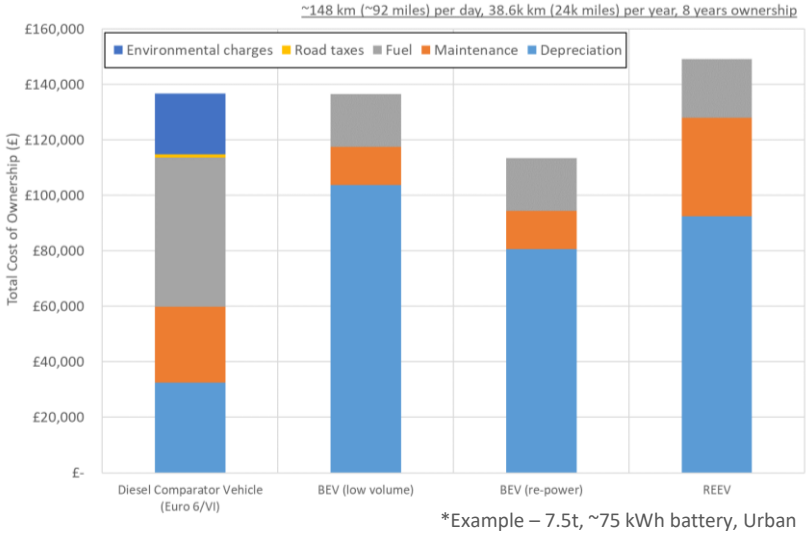


Make and Model (Future Release)	Drivetrain	Electric Range
Iveco Daily*	28-84 kWh (BEV)	<174 miles (NEDC)
LDV EV80	56 kWh (BEV)	120 miles (NEDC)
Renault Master Z.E.	33 kWh (BEV)	124 miles (WLTP)
Mercedes-Benz eSprinter (2020)	55 kWh (BEV)	93 miles (OEM)
VW e-Crafter (2021)	36 kWh (BEV)	107 miles (OEM)
MAN eTGE (2021)	36 kWh (BEV)	107 miles (OEM)

* Plug-in van grant not available

Rigid Trucks – Low Volume to OEM

- REEV and BEV available as retrofit or repower from low volume manufacturers such as Emoss, Magtec and Tevva
- Currently economically and/or operationally challenging depending on duty cycle
- Approx. real world range* of 158 km (BEV) and 144 km (+542 km diesel, REEV)



*Example – 7.5t, ~75 kWh battery, Urban

Make and Model (GVW, Future Release)	Drivetrain	Electric Range (OEM)
Daimler Fuso eCanter (7.5t)	83 kWh (BEV)	100 km
Renault D Z.E. / D Z.E. Wide (16-26t, >2019)	200-300 kWh (BEV)	<300 km
Volvo FL / FL Electric (16-27t, >2020)	100-300 kWh (BEV)	<300 km
Mercedes-Benz eActros (18-25t, ~2021)	240 kWh (BEV)	200 km

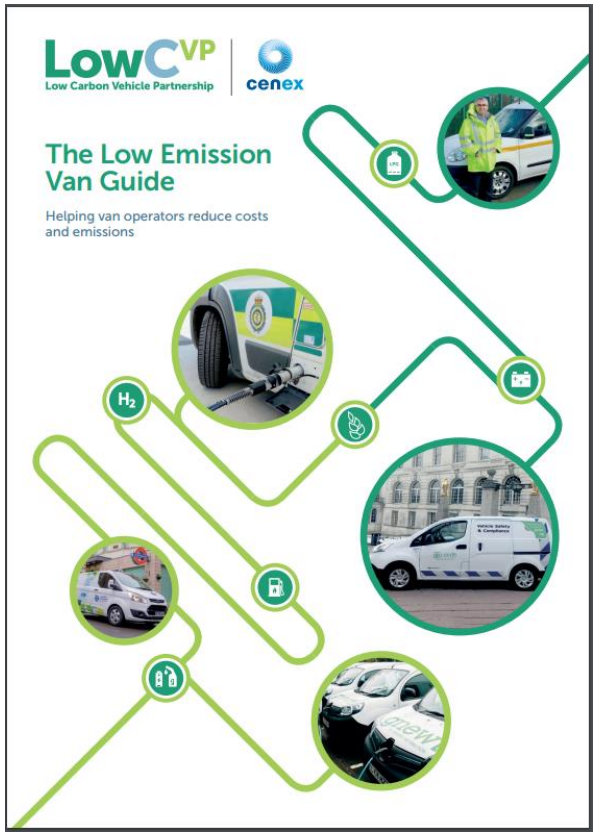
- Depending on battery capacity charging times from ~1h (up to 150 kW DC) to ~12h (22 kW AC)

Tractor Units – Research and Development Phase

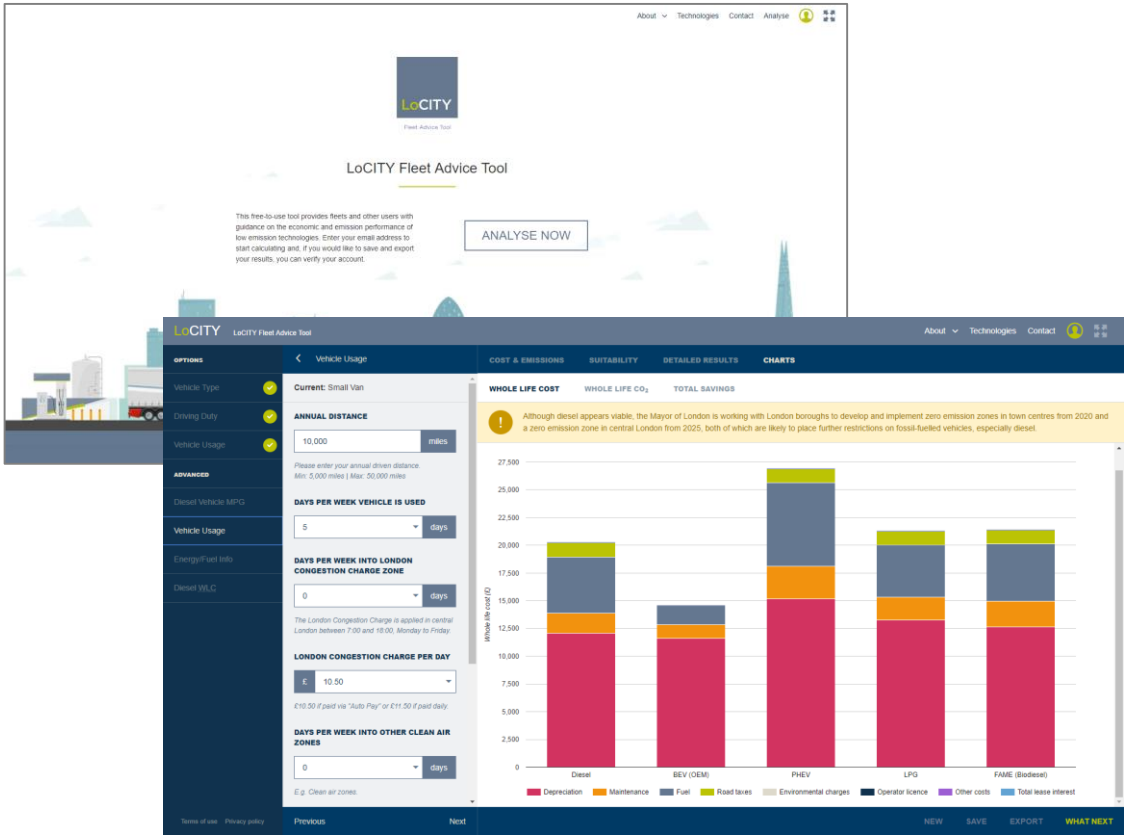
- Battery electric and hydrogen fuel cell
- Committee on Climate Change – Net Zero Report
  - 800 H_2 refuelling stations or 90,000 depot-based chargers
  - Decision on approach required 2025-2030, trials from now until early 2020s
- Funded Programmes
  - Low Emission Freight and Logistics Trial (£20m until 2020), Hydrogen Transport Programme (£23m until 2020), Hydrogen Supply Competition (£20m)

Ultra-Low Emission Commercial Vehicles

Tools and Guidance



https://www.lowcvp.org.uk/Hubs/lev/why.htm



https://fleetadvicetool.cenex.co.uk/#/

Thank you for listening

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