

Low Emission Taxi Guide

Technologies And Local Measures

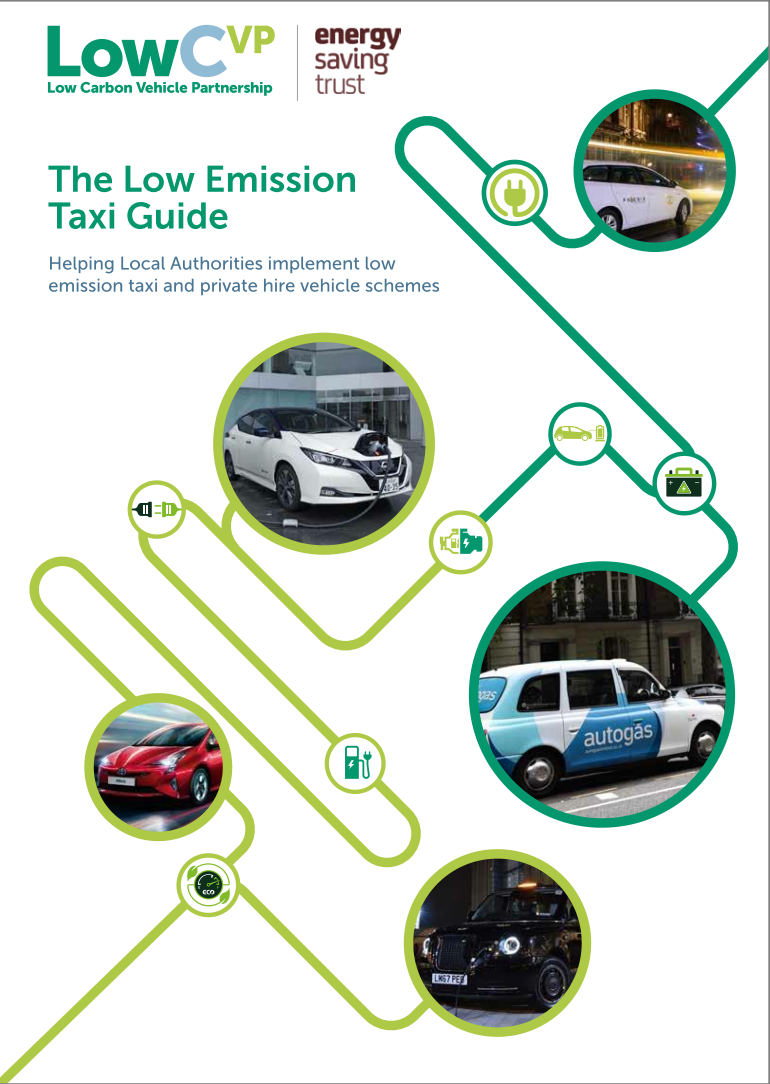


LowCVP
Low Carbon Vehicle Partnership
Connect | Collaborate | Influence



Low Emission Taxi Workshop – 14th January 2019
Gloria Esposito - Head of Projects, LowCVP

Low Emission Taxi Guide



Aims to aid local authorities introduce clean and low carbon taxi/private hire vehicles, outline a range of best practice policy measures and latest low emission technologies and fuels.

Taxi and Private Hire Vehicles

Battery Electric, Plug-in Hybrid, Hydrogen Fuel Cell, Best in Class diesel/petrol and hybrid, LPG retrofit/conversion



REGULATORY STANDARDS



FINANCIAL INCENTIVES



INFRASTRUCTURE PROVISION



EDUCATION & PROMOTION

National and Local Policy Measures

Defining a low and ultra low emission TPH

A low emission vehicle (LEV) in terms of this guide is one that complies with the minimum Euro emission standards below. These emission standards align those set in the UK Clean Air Zone Framework and London Ultra Low Emission Zone.

Figure 2: Minimum emission standards for Low Emission TPH vehicles

	
Euro 6 diesel diesel hybrid CVRAS/TfL approved LPG repower diesel black taxi	Euro 4 petrol petrol hybrid LPG conversion

LET Guide definition

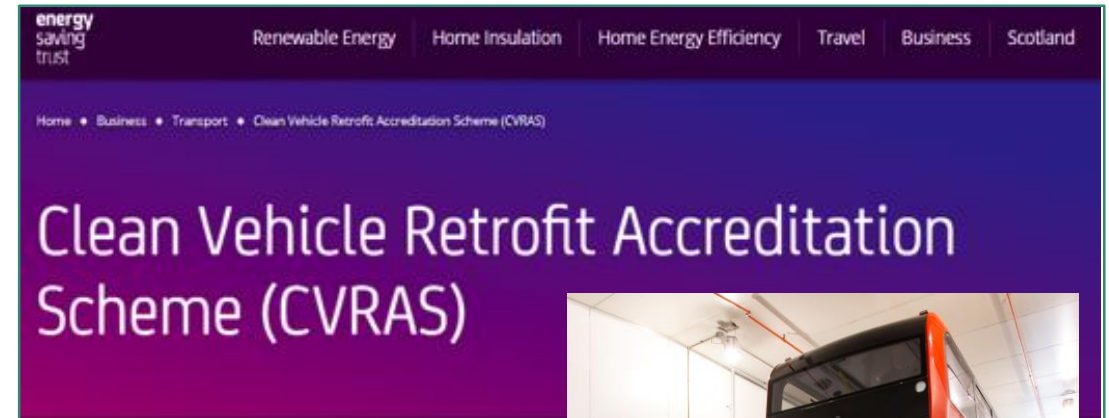
Ultra Low Emission Vehicle

<75g/km CO₂ emissions and a minimum 10 mile electric range.

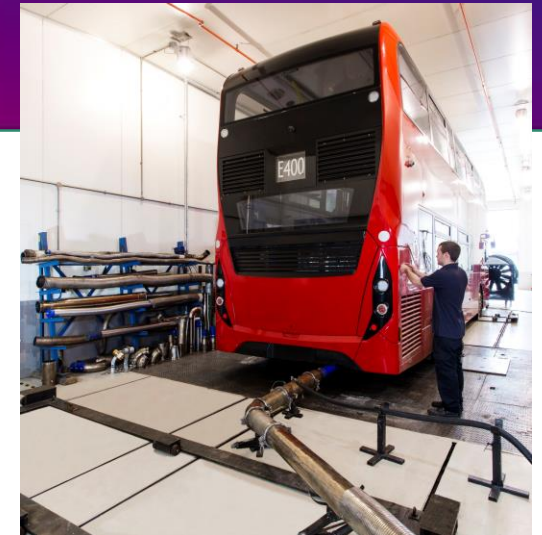
In order to meet the vehicle emission standards – buy new/second hand or retrofit diesel black taxis.

Retrofitting Technology to Diesel Vehicles To Achieve Euro 6 Emission Standards

- Retrofit technologies need to reduce diesel vehicle NOx and PM emissions by >80% to meet Euro 6 standards.
- CVRAS - Independent certification scheme for retrofit emissions reduction technology to demonstrate compliance with Clean Air Zones emission standards.
- Covers buses, coaches, trucks, RCVs, black taxis, cars and vans.
- Accredits retrofit technologies & companies supplying them. Confidence in the technology performance.
- One approved retrofit technology for black taxis – LPG repowering. None for cars.



Entails robust vehicle emissions testing to demonstrate compliance with diesel/petrol Euro 6 standards



Managed by Energy Saving Trust with support from LowCVP

Be wary of companies selling technologies which are NOT CVRAS accredited. No robust evidence they work.

Battery Electric

Technology and Market

- Early market, c2% new car sales
- Cars: Nissan Leaf, Tesla Model S, Hyundai Ioniq
- Taxis: Nissan eNV 200 combi, Dynamo Taxi
- Electric Range: 100 to 304 miles (NEDC)
- Zero emission tail-pipe (ULEV)
- Ideal for urban, start stop driving routes.



Total Cost of Ownership

Purchase Cost Vehicle/Infrastructure

- Higher than conventional diesel/petrol
- OLEV Plug-in Car Grant / Taxi Grant(PiTG)

Running cost

- Much lower fuel cost
- Lower maintenance
- Cars - Zero 1/2nd yr (<£40K purchase price)
- Taxis eligible for PiTG are road tax exempt
- Free entry to CAZ

Lower running cost makes TCO attractive!

Plug-in Hybrid/Range Extender

Technology and Market

- Early market, c2% new car sales
- Cars: Toyota Plug-in Prius, Mercedes-BENZ C Class
- Electric range: 19 - 39 (NEDC)
- Taxis: LEVC TX, 80 mile electric range
- Zero emission capable, CO₂ emissions <50g/CO₂ emission in engine mode.
- Allows more flexibility and longer journeys



Total Cost of Ownership

Purchase Cost




- Higher than conventional diesel/petrol
- OLEV plug-in taxi grant

Running cost

- Much lower fuel cost - operating in 'electric mode'
- Cars – Lower road tax if <£40K
- Taxis eligible for PITG are road tax exempt
- Free entry to charging CAZ

Cost effectiveness reliant on regular charging

EV Charging Infrastructure

	Slow 	Fast 	Rapid 
Power Rating	3.5 - 7kW	7 - 22kW	43 - 50kW
Electrical Supply type	AC	Usually AC, DC available at higher rates	AC & DC
Charge time	4 to 8 hours	2 to 4 hours	25 - 40 minutes (80% charge)

*Future Infrastructure
350kw rapid charger and
inductive charging*

EV Infrastructure - home charging (overnight), work place and on-street (rapid charging) – Zapmap

Incentives

- On-street Residential Chargepoint Scheme: £7500/charge point for local authorities
- EV Home Charge Scheme: 75% of cost of charge point & installation
- Workplace Charge Scheme: £500 per socket up to 20 for business, local authorities and charities
- Some electricity companies offering bespoke EV tariffs for home charging

Diesel/Petrol Hybrids PHV

Technology and Market

- Established market
- Cars: Toyota Prius, Ford Mondeo, Lexus IS300H, Mercedes-E Class
- Strong second market in particular Toyota Prius (Euro 4/5)
- CO₂ emissions: 51-234 g/km
- Complete flexibility with journeys
- Petrol hybrids can be converted to run on LPG

Total Cost of Ownership

Purchase Cost

- Similar to conventional diesel/petrol

Running cost

- Fuel cost savings
- Lower road tax for low CO₂ emission models



Diesel Taxi LPG Re-powering

Technology and Market

- Old diesel Hackney carriages can be re-powered with spark ignition engines and run on LPG
- CVRAS accreditation – Gascab technology supplier by Vehicle Repowering Solutions
- Estimated 100 retrofit LPG taxis running in London and Birmingham, approvals also in Glasgow and Edinburgh
- Significant NOx & PM emission reductions (meets Euro 6 petrol standards)
- BioLPG available, lower CO₂ emissions
- 1330 outlets selling LPG across the UK – DriveLPG refuelling map



Total Cost of Ownership

- Cheaper than buying a new taxi
- LPG lower cost than diesel
- Free entry to CAZ
- TfL introduced £2.5 millions grant scheme for repowering Euro 5 diesel taxis to LPG

Local Measures - Regulatory

- Restricted vehicle access based on vehicle emission standards e.g. charging CAZ
- Taxi/PHV licensing conditions to stipulate 'low emission vehicle' standards including CVRAS approved retrofit technologies/companies
- Set ambitious timelines newly licenced vehicles to be ULEVs
- Vehicle age limits for new and existing vehicles
- Dedicated ULEV only taxi ranks



Financial Measures

- Reduced fees for TPH licences and renewals
- Set LEV/ULEV requirements in local authority procurement guidelines
- Rebates and other financial incentives
 - Grants or loans for ULEVs (new/second hand) or CVRAS approved retrofit technologies
 - Purchase LEV/ULEVs and lease to local drivers
 - Offer charging infrastructure free or reduced cost
 - Offer grants or incentives for local business for charging infrastructure
- Taxi/PHV scrappage scheme
- Dedicated/discounted parking charges for ULEVs

Important to consider State Aid Rules when offering grant funding

Local Measures - Awareness Raising and Promotion

- Run awareness raising campaigns to promote low emission taxi/PHV initiatives
- Promote grants (vehicle and infrastructure) plus other incentives for ULEV, demonstrate cost savings and the business case
- Inform local community of location of EV charging points, EV page on LA website
- Work with local PHV companies to demonstrate and trial ULEV or retrofit technology
- Work with manufacturers to offer local businesses 'try before you buy'.

Low Measures - EV Infrastructure Provision

- Deploy fast and rapid charging infrastructure at city-wide locations including taxi ranks, places where drivers are stationary for periods of time, car parks, airports.
- Requires multiple stakeholder engagement - distribution network operator (DNO), charge point supplier, transport planning, parking.
- Considerations – availability of land, planning restrictions, on street charging requires a Traffic Regulation Order, possible re-inforcement of local electricity supply.
- Opportunities for LA funding - Local Implementation Plan, Defra Air Quality Grant, future OLEV ULEV Taxi Scheme, partnership with private sector.



Further Information

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