

Executive Summary

ULEV Strategy

Black Country

15 May 2020

Executive Summary

Cenex was commissioned by Black Country Transport to develop an evidenced Ultra-Low Emission Vehicle (ULEV) Strategy, Vision and Implementation Plan.

The objectives of the study were to:

- Build upon the existing Transport for West Midlands ULEV Strategy Report by Cenex;
- Baseline the current Black Country situation;
- Develop and analyse scenarios projecting the number of EVs, infrastructure, energy demand and grid capacity constraints;
- Calculate the benefits associated with these scenarios;
- Create and agree a five-year ULEV vision; and
- Outline an implementation plan to deliver the vision.

Challenges to Address:

The Black Country needs a coordinated ULEV programme to deliver its vision against the backdrop of six challenges:

- Political – commitments have been made to tackle climate change;
- Environmental – the world continues to warm, and transport is now the worst-performing sector in the Black Country for Greenhouse Gas (GHG) emissions;
- Societal – whilst mobility brings social benefits, carbon-emitting transport impacts health, life expectancy and resilience to respiratory disease;
- Technological – many EVs are being launched by manufacturers, so the Black Country needs to be prepared to take advantage of this transition, so it is not left behind;
- Legislative – the UK's net-zero 2050 target is binding, the WMCA has set a similar target for 2041 and some Black Country Authorities must be net-zero by the end of this decade; and
- Economic – the uptake of EVs can help drive economic growth through regeneration, planning, business growth, skills, tourism and inward investment – all even more important in the light of economic pressures due to covid-19.

A Vision for Change:

The Black Country will lead the West Midlands on the road to net-zero by accelerating and amplifying the EV transition in anticipation of a 2035 ban on the sale of conventional vehicles.

By 2025, this will be achieved by:

- Installing an additional 380 standard and 110 fast charging sockets;
- Coordinating with TfWM to support installation of additional rapid and ultra-rapid chargers;
- Leading by example by procuring only EVs for all new council cars and vans
- Equipping all council offices, depots, car parks and sports facilities with charge points;
- Publishing a local public transport decarbonisation action plan;
- Requiring most taxi and private hire vehicles to switch to ULEV;
- Using planning policy to deploy charge points at retail and business car parks;
- Deploying measures to slow the growth of the vehicle parc; and
- Establishing a programme to inform and encourage the public and businesses

If successful, by 2025 this vision is expected to deliver:

- A 1% reduction of transport CO2 emissions;
- A 10% reduction of transport NOX emissions;
- A 35% reduction of transport PM emissions;
- An increase of the number of EVs to at least 4% of the vehicle parc;
- Over 90% of Black Country land area within 5 minutes' drive of a rapid charger; and
- Over 95% of urban areas within 500m of any public chargepoint.

Black Country Ultra-Low Emission Vehicle Vision



The **Black Country** will lead the West Midlands on the road to **net-zero** by accelerating and amplifying the **EV transition** in anticipation of a **2035 ban** on the sale of conventional vehicles.

A Plan to Implement:

On top of the specific targets contained within the vision and Black Country-specific actions contained within the TfWM ULEV Report, the following actions and next steps are also recommended for the Black Country:

Policy:

- Agree the Vision as policy to ensure visibility across all council departments.
- Agree an in-depth vehicle replacement strategy so a clear pathway to net-zero council fleets can be outlined.
- Commission a wider evidence-led study to examine the ways in which journeys and the vehicle parc can be managed by local authorities.

Coordination:

- Ensure Black Country representation on the WMCA EV Steering and Working Groups.
- Take a leading role in coordinating all charging infrastructure deployments to ensure a coherent approach and avoid over- or under-supply.

Funding¹ :

- Set aside £2.25m capital investment plus Distribution Network Operator (DNO) connection costs and resourcing costs to fund this vision.
- Deploy infrastructure under an Own and Operate or External Operator model.

Site Selection:

- Coordinate with the WMCA who are working with WPD to develop processes that can provide accurate information on DNO costs.
- Feed 7 potential sites into the WMCA assessment of locations for transit and charging hubs.

Resourcing:

- Pool resource from across Black Country authorities to achieve efficiencies.
- Appoint one FTE management-level officer to manage the programme, especially procurement and operation of charging infrastructure.
- Ensure support of this lead with resource from transport planning, procurement, parking, highways, PR/communications, transport planning management and Place Directorate Leadership (or equivalent departments).
- Cost up this resource plan so it can be included in the next round of budgets.

See Section 6 (page 69) for more details

Key Insights from Projections:

The Vision is based on analysis of three scenarios constructed from current and expected UK Government policy ('Mid', '2035 Ban' and '2032 Ban'), which conclude:

EV Uptake:

- Up to 2025, all scenarios track closely due to a low baseline starting position.
- After 2025, the 'Ban' scenarios diverge from the Mid scenario.
- By 2025, between 14,000 (Mid scenario) and 32,000 (2032 Ban) EVs are projected, rising to 44,000 – 154,000 in 2030.

Infrastructure:

- By 2025, 369 (Mid) to 830 (2032 Ban) charging sockets are projected, rising to 870 – 3,027 in 2030.
- By 2030, the number of 7 kW chargers in the 2032 Ban is over triple those in the Mid.

- Just 16 rapid/ultra-rapid charging sockets are needed by 2030 in the Mid scenario, but 135 in the 2032 Ban scenario.
- The exact locations should be evaluated to ensure good coverage in-line with the objective to be within five minutes of a rapid charger.

Energy Demand:

- Residential charging increases the 2025 peak demand by 86 - 195, up to 249 – 865 MW by 2030, depending on scenario.
- The 2035 Ban scenario projects an additional 140 MW by 2025 and 563 MW by 2030.
- In all scenarios, electrical demand is likely to be higher in suburban areas.
- In all scenarios, the potential future deficit between demand and supply of electricity for EV charging is also likely to be highest in suburban areas.

Gap Analysis:

- Current provision of public 50 kW infrastructure is sufficient for projected 2025 rapid and ultra-rapid demand in the 2035 Ban scenario, especially in Wolverhampton.
- This scenario requires an additional 381 public standard and 113 fast sockets by 2025.
- Up to 2025, EV infrastructure procurement should focus on standard and fast chargepoints at long and short-stay parking locations, respectively.
- Additional sockets projected in 2030 are 1,500 standard, 300 fast, 50 rapid and 20 ultra-rapid respectively.

See Section 3 (page 39) for more details.

Key Insights from Benefits:

The benefits of the Vision are justified by the following analysis of the benefits of the scenarios:

Emissions Reduction:

- If the 2035 Ban scenario is followed, 1.3% CO₂, 10% NO_x and 25% PM road transport emissions reductions are projected by 2025.
- Only the Ban scenarios show significant changes in CO₂ due to the aggressive phasing-out of petrol, diesel and hybrid vehicles, producing 50-60% reductions by 2040.
- PM reduction is good throughout due to recent standards changes which will remove NO_x and PM emissions, even in the Mid scenario.
- None of the scenarios produce a net-zero car and LGV parc by 2040, meaning the road transport component of 2041 net-zero target for the West Midlands is difficult to achieve.
- However, maintaining (or slightly reducing) the vehicle parc has a significant effect on the total CO₂ produced by vehicles and the 2041 target becomes within reach for road transport.
- The impact of the covid-19 lockdown clearly demonstrates the large step change needed in road transport in order to achieve meaningful and large scale emissions reductions.

Mitigated Damage Costs:

- Total annual savings of between £20m and £55m are available from emissions reduction by 2030, depending on scenario. For the 2035 Ban scenario, annual savings for the three main emissions are: £12.8 million for CO₂, £13.5 million for NO_x, and £11.7 million for PM.
- In the 2035 Ban scenario, this equates 1/3 of 1% of the Black Country's GDP.

Noise Reduction:

- The noise from the engines of petrol or diesel vehicles is louder than EVs at speeds below 20 mph, especially if higher gears are selected.

- However, the UNECE technical standard that forces EVs to have sound generators below 12mph reduces this benefit so that any noise benefits from transitioning to EVs are likely to be confined to roads with average speeds of 12 – 20 mph.
- The maximum mitigated damage cost benefit from noise reduction is approximately one quarter of the benefits from individual CO₂, NO_x or PM reductions.
- Improved tyre technology or Connected and Autonomous Vehicles may add additional improvements, but these technologies are not yet prevalent.

Economic Benefits:

- The economic benefit from installation or operation of EV charging infrastructure is felt regionally and locally in regeneration, planning, business growth, skills/employment, tourism/trade and inward investment.
- The skills and employment benefits are already well-developed and accessible.
- Black Country authorities should seek to engage local training providers to ensure the local labour market is ready to install and maintain chargepoints.

See Section 4 (page 51) for more details.

Key Baseline Observations and Insights:

The implementation plan is justified because of the need to act to change the current status to achieve the vision:

Vehicles – The Black Country has a significant challenge to deliver emissions reductions both from the vehicle parc in general and specifically in the council fleets.

Vehicle Parc:

- Cars are the most popular vehicles in the area, with more petrol than diesel.
- The Black Country vehicle parc composition is broadly representative of the UK.
- The Euro 6/VI standard are only the third most common vehicle type with dominance by Euro 5/V and 4/IV, which have higher emissions, particularly NO_x.
- There is a high % Euro VI HGVs and buses, which have better emission standards.
- The number of pre-Euro 4/IV vehicles is a concern, representing 36% of the total parc.

Current EV Penetration:

- Black Country councils are the worst-performing West Midlands councils for EV uptake.
- However, all four authorities sit on or above the mean wage/EV uptake trend.

Vehicle Parc Emissions:

- Cars represent 60% of all transport CO₂; Diesel cars emit 33% and 46% of the area's NO_x and PM.
- LGVs emit 21% of the area's NO_x and PM because of high dominance for Euro 3 vehicles.
- HGVs have no CO₂ standards and emit 12% of the area's GHG emissions, despite being just 2% of the total vehicle parc. 22% of NO_x and 15% of PM come from HGVs.
- Car and LGV emissions are expected to reduce more easily than freight or bus emissions.

Council Fleets:

- LGVs dominate the vehicle fleet, although there are several HGVs and buses too.
- Dudley's fleet will be difficult to decarbonise due to the high proportion of HGVs.
- 89% of the Sandwell fleet are cars and LGVs, positioning it well to move to net-zero.
- Only 4 EVs and 12 Hybrids are operational throughout all four fleets.
- Where aggressive internal council decarbonisation targets exist, transition to cleaner powertrains will need to happen rapidly.

Taxi & Private Hire (TPH):

- Nearly 13,000 TPH vehicles are currently licensed in the Black Country. Around 9,185 of these are private hire vehicles registered by City of Wolverhampton Council, which are known to operate and originate from outside of the Black Country.
- 533 are Wheelchair Accessible Vehicles, which will be more difficult to transition to EV.
- It is expected that the Birmingham Clean Air Zone will promote a switch to EV.

Chargepoints – the Black Country currently lags the West Midlands in the maturity and diversity of its infrastructure.

- Current infrastructure is mostly rapid chargers or legacy standard chargers, with few fast.
- Provision is currently 20 plug-in vehicles (PiVs) per chargepoint, compared to 10 per PiV for the West Midlands.
- Around 80% of the area is further than one km from the nearest public chargepoint.
- 99% of the area is within ten minutes' drive of a rapid chargepoint.
- Sandwell lags in the Black Country's rapid chargepoint coverage.

Customers and constraints – EV and infrastructure uptake is expected to vary significantly across the Black Country

- Mapping early adopters predicts a diversity of EV uptake across the Black Country.
- The more likely locations for residential charging demand have been identified for further work, along with areas which will be more or less constrained by grid connections.
- DNO upgrades can take six months or more, so early engagement with WPD is crucial.
- Black Country should engage actively with WMCA's efforts to simplify site selection.

See Section 2 (page 17) for more details.



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