LOW CARBON HUB BOARD

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Subject: Electric Vehicle Uptake in GM
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PURPOSE OF REPORT

This report provides a summary on the uptake and use of Electric vehicles across Greater Manchester.

Uptake of Ultra Low emission vehicles is key to the success of a future low emission transport network and Greater Manchester’s ambitious climate change and air quality targets.

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1  Background

1.1  The UK government has reaffirmed its commitment to a future zero emission vehicle fleet with the publication of the “Road to Zero” Strategy in July 2018. The strategy aims to deliver key elements of the UK’s modern Industrial Strategy, in particular two of the four grand challenges, “Clean Growth” and “Future Mobility” are closely aligned with Ultra low emission vehicle roll out.

1.2  This builds upon the previous announcement of plans to ban the sale of new petrol and diesel cars in Britain by 2040.

1.3  The GM Mayor made manifesto commitments to be a global leader in tackling climate change and reducing transport emissions must be a part of this ambition. The introduction and proliferation of zero emission tailpipe solutions are a key measure identified and advocated in GM’s 2040 Transport Strategy, Climate Change Strategy, Air Quality Action Plan and Springboard to a Green City report.

1.4  75% of Nitrogen Oxides (NOx), 80% of Particulate Matter (PM) and 32% of Green House Gas emissions (CO2e) in Greater Manchester are derived from Road Transport, with private car trips responsible for 43% of NOx and 58% of CO2e road emissions. TfGM and the GMCA seek to reduce essential private car emissions by encouraging a switch to ultra-low emission vehicles (ULEV) and providing access to a car share solution allowing customers to reduce or remove private car use where possible.

2  National EV trends

2.1  The Office of Low Emission Vehicles (OLEV) was established to kick-start growth in the electric vehicle market. Current UK objectives are set as;

- every new car an ULEV from 2040 and an effectively decarbonised fleet by 2050 to meet our Carbon Plan targets;
- a network of supporting infrastructure that ensures ULEVs are an attractive customer proposition;
- world class skills and facilities for the development and manufacture of ULEV technologies, exporting vehicles globally;
- a smarter electricity grid that maximises the benefits to vehicle owners and the electricity system from the shift to ULEVs

2.2  The aforementioned “Road to Zero” strategy has built upon these goals with an interim trajectory:

- At least 50%, and as many as 70%, of new car sales and up to 40% of new van sales being ultra-low emission by 2030

2.3  During 2017, nearly 44,500 new ultra-low emission vehicles (ULEVs) were registered in the United Kingdom, an increase of 20% on 2016.
2.4 The UK's total ULEV vehicle parc (including both electric and plug in electric) now stands at 158,000. This represents significant growth on the 6000 vehicles registered in 2011.

2.5 To put this into context, despite the phenomenal growth this portion of the market remains minute when compare to the 3m vehicles sold each year. The current market share has been hovering at approx. 2% of total sales, but has jumped to its highest ever share of 4% in August 2018. There are approx. 37m vehicles on the UK’s roads, this means that ULEVs make up approx. 0.42% of all vehicles.

2.6 When compared with other major European nations such as Germany and France, the UK has slightly better uptake. Norway are the clear leaders in Europe (and the world) in terms of market share. Norway has achieved this through significant incentives including removal of purchase taxes, VAT and recurring fees making EVs price competitive with conventional cars. However to put this into context the Norwegian vehicle market amounts to 150k vehicle sales per annum, making it the equivalent of circa 5% of the UK market.
3 GM EV trends

3.1 There are currently 2,800 registered plug-in vehicles in Greater Manchester. The graph below shows the uptake profile and is annotated to highlight the impact of the installation of the GMEV network and the increase in vehicle choice. There has been a significant increase from nine small ULEVs models available on the market (eligible for plug-in grant) to a wider choice of 77 models.

3.2 When compared to other northern cities Greater Manchester is on par. For example Leeds has 4,000 vehicles, while Merseyside has only 1,200 registered.

3.3 However when compared to other major UK conurbations GM is trailing behind. London (inner and outer boroughs) has just under 17,000 and the Birmingham City region has 14,000 registered ULEVs.

N.B. The dataset does have some weaknesses in that it displays the current registration address and does not necessarily indicate where the vehicle is kept or operated.
3.4 Broken down by local authority, it is clear that the pattern of growth (by registered keeper address) is fairly even, however higher uptake is indicated in Manchester, Trafford, Bury and Stockport and lower uptake in Tameside.
4 GM EV Infrastructure

4.1 Prior to 2011 no clear business models existed for EV network development and the customer base was non-existent for private investment (particularly in first generation technology).

4.2 The OLEV ran a Plugged in Places (PiP) funding competition in 2010, with funding award in 2011. The PiP funding call focused on exploring business models, infrastructure solutions, and market demand.

4.3 GM secured PiP funding and installed 324 public charging sockets comprised of 160 dual headed 15KW posts (7KW per unit) with 4 rapid chargers.

4.4 The network currently has:

- 2,216 Members are now registered to GMEV (August 2018), with membership growing monthly.
- 181,437 Individual charging sessions since installation, likely to reach 200,000 by Christmas 2018.
- Average 42,430 KW/h drawn from the GMEV network each month, up from 39,000 this time last year.
- Members are accessing the network on average 4.4 times per month (Aug 2018) with an average power drawn per charging session of 8.5 KW/h.
4.5 Usage varied in each of the ten districts. Manchester has the most extensive GMEV charging point network, with 53 charge points (106 total outlets), while Tameside has the fewest charge points with only 7 (14 total outlets).

4.6 The number of charging sessions and amount of energy drawn (kWh) are two similar key indicators for measuring usage of the network. The map below indicates usage by district.
4.7 Of further interest is the distribution of registered GMEV users. The map below uses Charge Your Car registration data (August 2018) to show where GMEV Users have registered their vehicles.
5 GM network development

5.1 The GMEV infrastructure is functional and well utilised but has some challenges:

- 1st Generation infrastructure (predominantly ‘fast’ chargers) installed in 2013
- Lack of consistent funding - majority grant funded (Plugged in Places) with local match funding provided
- Lack of high power infrastructure - only 4 rapid chargers installed, 1 restricted to bus use only
- Need for strategic development – some locations are heavily used and need upgraded/expanded, others under-utilised.
- Demand continues to increase - over last 12mths, significant growth in demand from residents, businesses, fleet owners, etc. for EV charging infrastructure

5.2 To begin to understand demand and project future growth TfGM have developed an EV charger location model. The model combines various datasets including power supply availability, parking data and traffic flow among others. A programme is currently underway to engage with stakeholders to identify potential charging infrastructure locations.

5.3 In order to upgrade, expand and sustain a quality charging network TfGM have released a longer term tender opportunity (GMEV EVCI tender is issued and underway). Under this arrangement TfGM will set the price of GMEV charging products and retain ownership of existing networks. GMEV will facilitate a “Host” agreement, through which suppliers are expected to increase the
infrastructure provision along with setting appropriate prices and collecting revenue.

5.4 This arrangement will also allow the network to take advantage of innovations and opportunities, examples might include:

- Load Management – balancing grid demand, controlling charging times
- Vehicle 2 Grid – balancing grid demands by utilising parked vehicle batteries
- Enabling future mobility models – Mobility as a Service (MaaS) Car share, driverless vehicles (CAVs) e-bike charging etc.

6 Future opportunities and challenges

6.1 It is clear from UK and local trends that the customer base for ULEVs is now rapidly increasing. The sector continues to attract commercial investment, this will gradually drive down the high capital costs of battery technology and consequently vehicle prices. In turn this will see a move from early adopters to mass acceptance. This brings with it the need to upgrade/replace existing infrastructure and expand provision to support the decarbonisation of transport.

6.2 The “Road to Zero” report recognises this and the government have set out a number of supporting policy measures, including:

- A push for Charge Points to be installed in newly built homes, where appropriate, and new lampposts to include charging points

- The launch of a £400 million Charging Infrastructure Investment Fund to help accelerate the roll-out of charging infrastructure. The request for proposal to appoint a fund manager was launched in July 2018

- Creating a new £40 million programme to develop and trial innovative, low cost wireless and on-street charging technology

- Launching an electric vehicle charge point design competition

- Ensuring charge points are smart ready by giving government powers to set requirements prohibiting the sale or installation of charge points unless they meet certain requirements.

6.3 Historically, funding has been released competitively with Greater Manchester having success early on (funding for current GMEV network). It is expect that more funding opportunities will be made available, particularly to support the drive to improve air quality across the country. Some relevant opportunities include:
• **Clean Air Plan** – Measures under the plan will look at options for “Electric Vehicle incentivisation”

• **Clean Air Plan “Early measures” funding** - In 2018, TfGM successfully bid for £3m from the Joint Air Quality Unit (JAQU) TfGM will utilise this to install 48 additional rapid charge infrastructure points (24 sites with 2 charging heads at each site), along with a communications campaign aimed predominantly at businesses to increase uptake of EVs.

• **ULEV Taxi and Private Hire funding** - £6m is available to support the installation of taxi specific charging infrastructure. TfGM will lead and submit a bid on behalf of GMCA in 2018.

• **Ultra-Low Emission Bus fund** – TfGM on behalf of GMCA has submitted a bid to the £48m DfT fund for 64 electric buses. The bid includes 64 depot based rapid chargers and management systems. Manchester based bus operators have also submitted bids to this fund.

6.4 There are significant challenges for GM’s plan to increase ULEVs. Not least in the necessity to supply the required energy to meet demand and the infrastructure to access that energy spatially. An Electricity North West forecast determined:

Assumes in Region by 2030;
- 720,000 domestic EVs
- 80,000 Electric Vans
- Drawing 3-8kw for 8hours (mostly topping up over night)
- This would add an additional demand of 2 Gigawatts
- As a reference point, all of Manchester currently draws 400 MegaWatts
7 Conclusion

7.1 It is clear that decarbonisation of transport is inevitable and growth in ULEVs has been sustained since 2014, it is therefore expected that there will be further, and likely rapid increase over the next ten years.

7.2 A strong partnership with public sector and business is needed to meet the demands of a growing fleet of ULEV vehicles.

7.3 In addition, to public network expansion there needs to be continued local and national support to:

- Educate the public about the benefits of ULEVs in terms of air quality, GHG reduction and whole life costs.
- Actively promote ULEVs both directly and indirectly – through public events and demonstration of the technology.
- Provide leadership by implementing ULEVs in publically owned fleets, taxi and bus fleets.
- Jointly work with DNO Electricity North West to address potential barriers to infrastructure and uptake – including on-street charging.