Briefing note to Place Overview and Scrutiny Committee

4th March 2024

Alternative Fuels

Alternative Fuel Options

The move towards alternatives for internal combustion engines (ICE) for Council fleets continues, with electric being the lead alternative, although hydrogen, bio-methane, compressed natural gas and liquid natural gas are other options, albeit in their infancy in terms of availability and also vehicle refuelling centres being in place.

Electric Vehicles

From research, local authorities have continued to invest in Electric Vehicle (EV) infrastructure in the past year, with 44 per cent of councils increasing the number of charging points at their depots year-on-year. The number of charge points increased by 1,117 last year, representing a 40 per cent increase in the number of chargers year-on-year, as the total number of chargers has increased to 4,615 across the UK.

Nationally, Councils were also planning to invest record levels into EV charging infrastructure at their depots last year, with over £12.8 million planned for 2023. This was up 41 per cent from the £9.1million spent in 2022 and up 212 per cent from the £4.1million invested in 2021.

Overall, the number of electric vehicles in council fleets increased by 26 per cent last year. Councils have also been prioritising investment in EV vans ahead of EV cars and larger LGVs. The stock of EV vans increased by 30 per cent in 2023 compared to a 21 per cent increase in the stock of EV cars.

The research also revealed regional differences in how different local authorities were shaping up in their goal to create a greener fleet. Scottish local authorities are leading the charge with electrifying their vehicles as 14.2 per cent of their fleet was electrified. Conversely, Northern Ireland is lagging compared to the rest of the UK's councils, as only 2.8 per cent of their fleet is electrified.

Advantages and Disadvantages of Electric Vehicles

Electric vehicles offer advantages and savings including:

- Refilling a petrol or diesel car costs on average between 19 - 21p per mile, while recharging your electric car can cost as little as 3p per mile for home charging, around 14p per mile on lamppost chargers and around 18p per mile for rapid public charging. The savings will be most significant when owners charge at home and have access to an off-peak overnight electricity tariff, for which businesses may not have access to.
- There are fewer mechanical components in an electric vehicle compared with conventional vehicles, which often results in lower servicing and maintenance costs.
- Lower or zero vehicle excise duty (VED). However, from 2025 VED will also be charged on electric vehicles. The first-year rate will still be lower for electric vehicles (cars) – only £10 compared to £120-£945 for petrol or diesel vehicles – but after that all vehicles will be charged a standard rate of £165 per year.
- Zero emission vehicles – those emitting 0g/km CO2 – qualify for the cleaner vehicle discount available until December 2025. All other vehicles, regardless of their emissions status will be required to pay congestion charges where they are introduced already.

- The lower or zero emissions of plug-in vehicles mean that they will attract lower charges from clean air zones being implemented around the UK and London's ultra low emission zone (ULEZ).

Disadvantages of Electric Vehicles - cons

- Finding a Charging station - EV charging stations are fewer and further between than petrol/diesel stations.
- Charging takes longer.
  How fast do electric vans charge?
  Recharging your battery can take anything from one to 10 hours depending on how you opt to charge. Here's the low down on various charging speeds:
  Slow charging: 3 pin/off street produces 10-13 miles per hour charge.
  Fast charging: Home/long stay/depot charging produces 20-33 miles per hour charge
  Rapid charging: Motorway/Service Station produces up to 400 miles per hour charge.
  The above figures are estimated, and depending on your vehicle settings, the type of charger you use, and your useable battery, these charging times could differ. It's also important to note that you will get faster charging speeds the lower your battery is. And as your percentage increases, the slower the car will charge.
- The driving range on a full charge.
- Higher Initial Purchase Cost.
- Replacing the Batteries is Expensive.
- There needs to be an adequate power supply to introduce fleet charging

Fleet Replacements

Blackburn with Darwen BC has a vehicle replacement programme that is reviewed annually, with replacements detailed for the next 5 years. The replacement programme is managed via capital financing provision, with a report taken to Executive Board each year for approval.

For each vehicle planned for replacement, alternative fuel usage is foremost on the list of items to consider. However, the commercial vehicle market, for those vehicles above 5 tonnes, whilst having some specialist companies make adaptations to assembly line vehicles to convert them to EVs and also a minimal number of original equipment manufacturers (OEM) providing commercial options, there are issues with this, in terms of payloads being reduced, with batteries being heavier and of course the main issue, range of the vehicles, with 150 miles being an optimum for large goods vehicles and the resultant need to access a superfast charger that would still take about 8 hours to fully refuel the large commercial electric vehicle. Due to the size of the larger vehicles and their batteries, they are extremely 'power hungry' in terms of electricity supply needed to charge large goods vehicles.

Accordingly, the main thrust of EVs for commercial use is with vans, with more manufacturers developing options for EV vans and also hybrid vans. Blackburn with Darwen's fleet will shortly include a total of 14 electric vehicles, all of which are vans.

As an example of the options for electric vehicles, alternatives for the vans continue to be explored with various options on the market. The cost of these can range from approximately £32,000 for a small van up to £70,000 for larger vans. This is can be up to twice the cost of its diesel counterpart,

with electric vehicles not having the same carrying and towing capacity, which would be needed for a number of the operational teams.

As a replacement option for the large refuse collection vehicles, there is only one OEM option commercially available which is the Dennis Eagle eCollect. The cost of these are around £480,000 each with an additional cost for the charger, the ICE version of this is £210,000. There are other companies that retrofit commercial vehicles to become electric vehicles, but their costs are comparable with OEM produced vehicles.

However, the electric costs to power the electric vehicle can be less than half of that of diesel, with additional savings in the form of zero vehicle tax for EVs until 2025 and reduced servicing costs. There would be additional costs in the form of suitable electric vehicle charging points and associated infrastructure at the depot needed to develop further EV usage in the Council.

There are also current considerations for large goods vehicle usage across the country, with usage restricted to predominantly urban areas. The full impact on how large goods vehicles such as a refuse collection vehicle (RCV) would suit landscapes similar to Blackburn with Darwen is currently unknown, although feedback from Lancaster City Council who use electric refuse collection vehicles is not entirely positive, due to charging issues, reduced payloads and battery life. There is a significant lack of performance data surrounding electric RCV's, meaning there would be a significant risk associated with moving over to large commercial electric vehicles.

There are fully electric options for the footpath and road sweepers but the cost of these can also be 2-3 times more expensive than its diesel counterpart. The reliability of the electric road sweepers has also been questioned and as we do not have spare vehicles, we cannot afford the downtime. There is also the issue of reduced payload due to the weight of the battery pack.

Charging Facilities

The majority of the Council's electric vehicles charge at Davyfield Road depot, where the existing EV charger has in 2023, been supplemented by an additional 8 chargers for fleet use, as well as 2 chargers for staff vehicles to pay to use. There is also a charger at Fielden Street car park where Councils vans can charge.

The 8 new electric vehicle chargers at Davyfield Road depot cost £39,000 and whilst an application for grant support from the Government was pursued, we were not successful.

Despite the new chargers being in place, the Council cannot charge larger vehicles at the depot, as there is insufficient electrical feed capacity available at present. Discussions with Electricity North West are commencing, but the costs for the work needed to increase electrical supply for more electric vehicles to be charged is likely to exceed £110,000. At present, we have though reached the limit of supply for charging capacity at Davyfield Road depot, due to the limits outside of the Council's control.

All Council depot EV chargers are linked to a back-office system. This as well as giving intelligence on usage and future requirements, can accommodate variable charging, e.g., which vehicles to charge first if site supply capacity is restricted, by how much (e.g. a vehicle may only require 50% charge to undertake operational requirements), and the charging rate (e.g. a single 60 kW dual charger can charge one vehicle at 60kW DC, or two at 30kW DC simultaneously, or one at 10kW and one at 50kW DC simultaneously).

Locations chosen for the installation of EV chargers are those where EVs will be based or operate from and solutions for charging infrastructure are all site and electrical supply dependant, in addition to operational requirements. Considerations include:-

• Whether it is possible to charge vehicles in turn overnight to spread load and reduce peak supply requirements.

• Charging vehicles only to the level they need for service requirements rather than to a full charge every time.

• Linked to both above points, the maximum output of chargers required on each site (this may be a combination of low and higher output chargers.

• Requirements for on demand rapid charging.

• Electrical input supply available

• Usage regimes of vehicles etc.

It will not always be practically possible or economically viable to install either any charging infrastructure, or to a required capacity, at every council location where EV's may be operating from, but in these cases other solutions to facilitate the use of ultra-low emissions may be viable, such as commercial on street or service area charging may be an option for some of these depending on work patterns. In some cases the Council may consider making use of commercially available rapid charging facilities. There are several practical issues that will need to be resolved, one way forward may be to introduce a pilot scheme, following discussions with commercial EV charge point providers.

Infrastructure Partnering

On the face of it, building partnerships with nearby organisations that operate similar fleets of vehicles to share the planning and cost of installation of charging infrastructure is appealing. However, in practice, this has proved challenging on the limited occasions when discussions have taken place across the country. The reasons for this include differing organisational objectives, financing/procurement, prioritisation of use and back-office systems.

The other potential option for ULEVs within Lancashire is the use of Hydrogen.

There are two forms of technology, one is the use of hydrogen to power fuel cells to run an electric motor, and the other is a form of Internal Combustion Engine (ICE) that runs off hydrogen. Both technologies allow for substantially zero tailpipe emissions and come within the Ultra-Low Emission scope. At present the nearest proposed commercial hydrogen station is at BOC close to the A580 at St Helens a few miles outside of Lancashire, but it is expected that provision will grow over the next few years and there may be options for hydrogen fuel to be stored in depots for county council vehicles. For some larger vehicles hydrogen may be a practical solution for the Council.

Lancashire is home to leading edge technology firms and academic research in relation to Hydrogen provision.

• The Lancaster Hydrogen Hub Lancaster Hydrogen Hub - Lancaster University is a local university/industry collaboration that includes the development of hydrogen for transport

• The high technology firm Nano sun, based in Lancaster, NanoSUN Hydrogen Fuel, Storage & Distribution Solutions have developed solutions for transporting hydrogen in containers to supply transport depots.

It is possible that partnering for hydrogen use may be an option, but supply and refuelling technology is insufficiently advanced to make an informed judgement on this.

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