

Transport and Environment Committee

2.30pm, Tuesday, 5 March 2019

Use of Street Lighting for Electric Vehicle Charging

Item number	7.7
Report number	
Executive/routine	Routine
Wards	All
Council Commitments	C18

Executive Summary

Committee has requested a report in the use of lampposts as charging sites for electric vehicles. A number of Councils are trialling the use of this technology and there are new suppliers now on the market. Whilst the technology is technically feasible there are some issues that need further exploration. It is proposed to have further discussion with Scottish Power to evaluate an Edinburgh pilot and keep this issue under review. Progress on this will be reported to Committee as progress is made.

Use of Street Lighting for Electric Vehicle Charging

1. Recommendations

- 1.1 Committee is asked to note that:
 - 1.1.1 a trial using street lighting columns for electric vehicle charging (EV) is not proposed currently but will be kept under review.

2. Background

- 2.1 At its meeting in [4 October 2018](#) Committee considered the Business Case for EV Charging. The report was approved with Committee noting that a further report would be presented within two cycles on the use of lampposts as charging sites for EVs.
- 2.2 The use of street lighting columns is discussed in this report.

3. Main Report

- 3.1 A number of Councils are now trialling the use of lampposts for EV charging. This is seen as a new way for residents who don't have access to off street charging to charge their vehicles "at home" i.e. on their street.
- 3.2 The technology works on the basis that a charge point unit is fixed to a lamppost. The EV user plugs a cable into the unit to charge the vehicle taking the electricity from the street lighting supply. This is an unmetered supply, so the "meter" is built into the charging cable. Users are then billed for the amount of energy consumed. There may also be other charges for maintenance and back office functions. Figure 1 below illustrates some examples:



Figure 1: Examples of Lamppost Charging for EVs

- 3.3 The benefits of using this technology are seen as:
- 3.3.1 utilising existing infrastructure;
 - 3.3.2 avoiding expensive installation grid upgrades and equipment costs;
 - 3.3.3 allowing residents with no off-street parking to charge near their homes;
 - 3.3.4 saving considerable installation time in comparison to separate ground mounted charging stations - as it only takes 30 minutes to install;
 - 3.3.5 avoiding street clutter and has minimal visual impact;
 - 3.3.6 eliminating the need for dedicated EV charging bays; and
 - 3.3.7 making better use of street lighting assets especially in the daytime when street lights are switched off.
- 3.4 Comments from distribution network operators (DNOs) on the use of lampposts for EV charging suggest that it allows for a more balanced grid, less excavation costs and avoids the need to build new electricity networks.
- 3.5 Examples of two schemes are:

Ubitricity

- 3.5.1 this was one of the first companies to trial this technology. Starting with a small trial of three lampposts in Kensington and Chelsea London Borough Council (LBC), this has grown into the installation of charging units at 60 lampposts across the borough for residents charging at a rate of 3-5kW. They can fit most lamppost types. They do however require the residents to buy a Ubitricity metered Smartcable. Residents are then billed for the energy they use but they can charge at any lamppost.

Char.gy

- 3.5.2 this is a relatively new company that has recently partnered with Southwark LBC to trial 50 charging units across two areas of the borough. These units can charge at 7kW and will all be publicly accessible. Unlike the Ubitricity model they don't require a special cable. Residents can use their smartphones to select how to pay. Char.gy also offer local Councils access to an online portal that allows them to monitor the charging units and perform remote software upgrades. They are also designed to fit any lamppost.
- 3.6 In addition, there are companies such as Evolt also offering a Pay as You Go option and Rolec EV which are proposing energy efficient lighting combined with fast charging. This is a very new technology but illustrates how quickly the market is moving in this area.

Street Lighting in Edinburgh

- 3.7 The Council has over 63,000 street lighting columns which are a mix of concrete, steel and aluminium. Traditionally many columns were positioned at the edge of kerbs however practice now across the city has been to position columns back from the kerb. Only columns situated at the kerb are suitable for charging ensuring no

trailing cables across the pavement. It is estimated that only 25% of columns are at the kerbside with current policy to move these back when renewing or replacing the columns.

- 3.8 Older columns will also not be suitable for installing charging units as will those constructed of concrete. Another key feature will be the diameter of the column and whether it can house the charger.

Liaison with Scottish Power

- 3.9 Scottish Power Energy Network (SPEN) is the DNO for the Edinburgh area and a very important player in any possible trialling of lampposts in the city for EV charging. The DNO is responsible for the supply of the electricity to the street lighting columns and would have to be consulted on any potential impacts on that supply. Any additional electrical upgrades to the supply would require the Council having to make an application to SPEN who would ultimately have the authority to approve. Liaison with the DNO is therefore crucial.
- 3.10 A meeting was held with SPEN in December 2018 to explore the issues around EVs and street lighting. This has been followed up with information provided by SPEN suggesting that the approach is technically feasible. They looked at two potential trial areas in Edinburgh - one at East Market Street and another at the west end of the city. The East Market Street trial is ruled out on the basis that major upgrades would be needed to the network which would be very expensive.
- 3.11 A trial in the West End is possible because of the suitability of the lampposts however it raises a number of major considerations relating to parking. SPEN have stated that because of limitations on street lighting cables they would be limited to a 3kW charge which would mean they would take at least 12 hours to charge.

Issues and Challenges

- 3.12 SPEN also raised some other technical issues including:

Power Supply

- 3.12.1 It is essential that local electricity supplies remain safe and reliable. A 3.5kW charging unit will likely not disrupt the power supply however if higher power chargers are needed i.e. 7kW this might require a new power supply. In order to allow power to be safely drawn from the cable it may be also necessary to carry out upgrades to the columns i.e. install new fuses.

Voltage Drop:

Linked to the power supply issue. Under the specification for public lighting supplies there can be no more than a 3% drop in voltage. Street lighting networks are an AC charge. The use of an AC charging unit on one column may require minimal modifications but if several are installed in a street this could impact the voltage drop of the streetlights. Distance between chargers would therefore be an issue which might mean limiting the numbers in a street.

Earthing

3.12.2 Any alterations to a street lighting column must comply with all protection standards. Each individual charging unit attached to a street lighting column will require dedicated earthing boxes to avoid tripping the entire lighting network due to a localised charging point fault.

Design specification:

3.12.3 This depends on the street lighting layout either a single lighting column fed from DNO feeder or a dedicated street lighting network fed from lighting control. Most trials seem to have been based on single column approaches.

Parking and Charging

3.12.4 Careful consideration will be required as to how charging points are accessed and what parking conditions will need to be applied for example whether users will be required to pay for their parking, in addition to the charges for electricity.

Health and Safety

3.12.5 There are health and safety issues that need to be assessed. It is not only the position of the street lighting column that is important but also where it is positioned in the street. If cars have to be left for least 12 hours then trailing cables may be a particular trip hazard particularly in winter months when light levels are low.

3.13 Some other general issues include:

3.13.1 Understanding the options for users to be able to access the charge points and whether they are restricted to residents within certain streets or to wider public use;

3.13.2 The road space next to the charging column will not be dedicated to EV charging so there might be competition for that parking space from non-EV users. It would also be important to avoid trailing cables if an EV car was parked away from the lamppost;

3.13.3 Whether any enforcement would be required to ensure safe use of the charging units;

3.13.4 if responsibility for managing these charging sites now falls to street lighting teams; and

3.13.5 whether any lighting equipment warranties might be affected by alterations to the columns.

Potential Trial in Edinburgh

3.14 The use of lampposts to charge EVs has been confirmed as technically feasible by SPEN. Some of the issues above are not insurmountable but they will require further development. However the discussions with SPEN identified other issues which focus more on management of this type of EV charging. In particular the 12 hour charging time for EVs using street lighting columns might create impacts in

controlled parking zones where these spaces are not currently designated as EV charging only. A TRO would be required to be able to address that issue although that might run a risk of creating a perceived dedicated parking space. Parking conditions and enforcement would be other issues to address, as well the payment mechanisms and any impact on parking revenue.

- 3.15 A specific issue relates to the number of suitable lighting columns. There will be only a small number suitable and the policy remains to site replacement columns away from the kerbside. Being able to roll out a trial in any wider sense might be very limited going forward.
- 3.16 Taking a pilot forward will require resources and funding. There is currently no budget to develop a trial and no specific resource to oversee and manage any trial.
- 3.17 Any development in this area would need to be compatible with the wider EV Action Plan and the work to develop on street charging. It is recognised that technically it is feasible to use street lighting columns to charge EVs and SPEN has indicated that impacts on the network could be minimal. However there are clearly a number of management issues that could create complexities that might be time consuming for any trial and possibly prohibitive. It is proposed to keep this issue under review and pursue information from the other trials as this becomes available.

4. Measures of success

- 4.1 The key measures of success for the EV Business Case will be an increase in the number of charging points across the city coupled with a growth in ownership of electric vehicles and increased usage of charging points.

5. Financial impact

- 5.1 Funding has been required for all lamppost EV charging trials to date. For the London boroughs they can access London's £13m Go Ultra Low City Scheme. Southwark LBC secured funding from this scheme of £0.3m for their trial with Char.gy. In contrast Kensington and Chelsea secured initial Council funding for their pilot but are now subsidising the price of the Ubitricity cables for residents for the wider trial.
- 5.2 For local authorities in Scotland an option for funding projects would be through the Office for Low Emissions Vehicles (OLEV) fund for on street charging. This scheme works on the basis that 25% match funding would need to be found for any funding application. Lamppost charging would be eligible for this fund. While OLEV do issue specific calls for funding, it is believed that applications submitted outwith these calls are considered.

6. Risk, policy, compliance and governance impact

- 6.1 The use of EV charging points is a new area for the Council. The development of solutions that can utilise existing structures such as street lighting columns is still relatively new. Some trials are only now concluding while others are just about to start. There has been no specific data released as yet as to their effectiveness at charging EVs and also whether there any issues raised either by the EV users or the councils themselves.
- 6.2 In addition information is still required from Scottish Power as the DNO as to the suitability in Edinburgh of any trials of this technology. Until further information is available there is still a risk of unknowns.
- 6.3 The use of street lighting columns for EV charging can however lead to a direct reduction in carbon emissions which will contribute directly to the Council's Sustainable Energy Action Plan (SEAP) targets. In terms of complying with legislation, the use of this infrastructure for charging would have a positive contribution to the mandatory carbon emissions reporting under the Public Bodies Duties (introduced by Scottish Government) as well as complying with the Climate Change (Scotland) Act 2009. The reduction of carbon emissions is also a key Council pledge.

7. Equalities impact

- 7.1 There are no adverse equalities impact associated with this report.

8. Sustainability impact

- 8.1 There are a range of benefits from the use of EVs particularly on carbon reduction and air quality. Compared to conventional cars, EVs emit substantially less carbon emissions thus contributing positively to the Council SEAP and carbon targets. The vehicles are also cleaner with far less exhaust emissions so delivering direct air quality improvements.

9. Consultation and engagement

- 9.1 The key consultee involved in this area of work is SPEN. While a meeting was held in December 2018 to explore the potential of using lampposts for EV charging further information is required from SPEN to enable any decisions to be taken forward.

10. Background reading/external references

None.

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11. Appendices

None.