InclusivEV: Technical & Procurement Considerations

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1 Introduction

It is important for car club providers to understand the opportunities and barriers to the wider adoption of electric vehicles (EVs) in shared use situations.

In view of the different total costs of ownership (TCO) proposition of electric vehicles compared with internal combustion engine (ICE) ones (i.e. EVs have higher initial capital costs, but lower operational costs), it is important to ensure that the vehicles are intensively used. In shared use this will only happen where they are allocated to journeys that suit their operating characteristics. As current EVs have a lower range than ICE vehicles they need to be utilised for local, predictable and repetitive journeys.

These issues lend themselves towards the integration of EVs within car clubs. In a closed environment of a car club, many of the technical issues experienced with EVs can be overcome by providing new users with a practical induction on how to use and recharge vehicles; and also by ensuring that the EV booking system provides sufficient time between bookings to ensure that the vehicle is sufficiently charged to complete the planned journeys.

This document therefore aims to provide an overview of the technical and operational considerations that are required to ensure that EVs can be used effectively within car clubs, especially those operating within low-income neighbourhoods.

2 Technical Considerations

There are some technical and operational issues surrounding the introduction and use of EVs within car clubs, especially those utilised within low-income neighbourhoods, including:

- Practicality Considerations.
- Charge Points.
- Back Office.
- Booking System.
- Payment Mechanism.

Each of the above technical points are covered in more detail below, including some of the areas that may need to be overcome to ensure effective use. [1]

2.1 Practicality Considerations

If EVs operated by car clubs are to prove popular, they must offer a practical and desirable alternative to conventionally fuelled vehicles. In terms of practicality for the user, the EV needs to provide sufficient space for carrying passengers and their possessions. It must be easy to operate and park, especially as such vehicles are likely to be utilised in urban areas. Charging the battery must be simple so that any user can do it conveniently.

However, the purchase cost of an EV is higher than a comparable conventionally fuelled vehicle. This makes it very difficult for car clubs to market EVs on the same basis as an ICE vehicle without some level of subsidy. Fuel and servicing costs of an EV are less than a conventional vehicle due to EVs having fewer moving parts that may require servicing and replacement.

2.1.1 Vehicle Charging and Range

Despite their quoted range, in reality electric cars typically have a range of around 120km when fully charged. The range of an electric vehicle will depend greatly on the user's driving style and whether the vehicle air conditioning is being used; both these factors can decrease the available range. It is important to ensure that each car has a sufficient charge for the journey, or that the charge can be topped-up during the trip. The time taken to charge a vehicle is still long relative to usage time and as a result, planning recharging between bookings remains an operational issue for car share operators.

Early trials of electric vehicles in car sharing schemes, undertaken by Carplus, have highlighted the practical issues surrounding booking and management of such vehicles and associated charging points. Trials have illustrated that it is essential to use a booking system to manage access to charging points and vehicles that takes into account the amount of charging time each EV requires, so the charge point will not be blocked to other users.

Whether charging is required between bookings will be determined by the distance travelled and driving style adopted during each booking or anticipated in future bookings. Any time allocated for recharging will also be influenced by the type of charging point, so the booking systems will need to be able to calculate the amount of time required on a booking by booking basis.

There are four charging regimes that can be considered; these scenarios assume that each car club parking bay has a dedicated charging point:

- Reserve the cars for charging overnight after each day's use. This is known as the 'Cinderella Model' and is not particularly effective. It is, however easy to implement and manage.
- Reserve the cars for charging after every booking for the same period of time that they were booked for. This is slightly more efficient than the Cinderella model but will still not provide optimal use of the vehicle.
- Each booking has sufficient time reserved prior to the booked period to ensure the battery is fully charged. A car does not appear as available if a booking is required at short notice and the battery has insufficient charge to complete the planned journey.
- Intelligent monitoring and alert. This requires the booker to indicate approximate anticipated mileage. The booking software used then allocates a car with the appropriate charge level available. This will work best if there is a pool of EVs available at one location. During the booking the charge levels are relayed to a central server at specified intervals and an alert is provided to both the central system and the customer when a certain level of charge is reached.

In some of the car share trials of electric vehicles, restrictions have been placed on the range of each booking (e.g. a 40km return trip) to help ensure that sufficient charge will be available for subsequent bookings. [1] This can help minimise the need to make use of a charging point during a booking in order to complete a journey.

In an urban setting, bookings can potentially be restricted to a zone or city boundary to manage vehicle range limitations, and ensure that even with end to end booking a car will retain sufficient charge to complete all journeys during the working day.

Smaller car share schemes are less able to afford the technology required to allocate cars to users based on the respective level of charge. Therefore, booking systems need to be able to allow adequate time between bookings to ensure that each vehicle booked out has enough charge available. If the cars are only used locally, it is possible that charging the vehicles overnight may provide sufficient charge for the daily use. However, this runs the risk that cars do not have enough charge to be used in a middle-of-the-night emergency.

If bookings are being taken by anyone other than the car share operator (e.g. by local shops or businesses), it is probably preferable to use one of the simpler booking systems.

2.1.2 Managing Range Restrictions

Restrictions can be placed on the range available for each booking (e.g. a 40km round trip) to help ensure that sufficient charge will be available for subsequent bookings. This can help minimise the need to make use of a charging point during a booking in order to complete the journey.

In an urban setting, bookings can potentially be restricted to a zone or city boundary to manage vehicle range limitations and ensure that even with back to back bookings a car will retain sufficient charge to complete all journeys during the working day.

2.1.3 Inductions for Members

One of the most significant operational challenges is to ensure that car share members receive an induction or some instruction to ensure that they understand how the EV operates. In particular, this should include information about booking, charging, starting the vehicle, understanding the range available and any warning systems that the electric vehicle operates.

Trials undertaken in partnership with Co-wheels in North East England illustrate that technical issues with electric vehicles can be avoided or at least minimised by providing members with a hands-on introduction of how to use the vehicle and the charging post. [1]

2.2 Charge Points

The installation of electric vehicle charge point should be based on five main factors: [2]

- Placement of the charge point.
- Equipment required.
- Price of the equipment.
- Installation of selected equipment.
- Interoperability with other charging systems.

Each of the above points are covered in more detail below.

2.2.1 Placement

Finding the right location for a charge point is vital to make sure the costs of installation are kept down and that the equipment is convenient for the users. The final placement of charge point equipment will depend on the purpose of the equipment and the location's characteristics.

2.2.2 Equipment

It is important to consider the type of equipment that you want to install to support EV charging. There is a choice of charging equipment available that allows a 100% charge to be achieved over a wide time range from overnight down to 30 minutes. These include:

- Standard charge – Standard 13/16 Amp plug/ 3.7kW power source, plugged into a mains voltage charge point. Suitable for work place charging, as well as on-street. Capable of charging a battery from empty in five to eight hours.
- Fast charging – up to 32 Amp/ 7kW power source. Standardised connector required. On street and dedicated charging posts. Enables a full charge in three to four hours or a top-up charge in 30 minutes.
- Rapid charging – up to 50kW. Stand-alone rapid charge stations and specialist infrastructure required. Capable of charging an empty battery to 80% in around 30 minutes.

The technologies and speeds selected are typically based on the placement site characteristics including who the charge point is meant for, the power availability, the budget available for the installation (see below), opening hours and amenities at the site. Other aspects to consider include exposure to weather, vandal and graffiti protection, impact on the local environment and how easy the unit is to maintain.

2.2.3 Price

The cost of the equipment is important, but should not be used alone when choosing an equipment and installation service supplier(s). A common mistake seen in procurement is that an organisation chooses the least expensive supplier with little emphasis on the quality of the equipment and aftersales service. It is very important to consider the experience of the companies tendering for your project, how they look after their customers during and after installation and whether there is any independent past experience that you can draw upon to help you make your decision.

The largest cost variable is the capital cost associated with installation, which will depend on the site characteristics such as whether a power supply exists and has enough capacity or needs an upgrade, how far the installation is from a suitable power supply, what surface the charge point is to be mounted on and what vandal, graffiti and accident protection is needed to keep the unit safe.

It is vital that enough site information is gathered prior to going out to tender to make the job of costing up installations as easy as possible for the charge point suppliers and installers. Providing this information is more likely to increase the number of organisations willing to tender for the work and provides you with a wider choice of equipment and supplier experience.

2.2.4 Installation

It is important to make sure that your charge point project runs smoothly and finishes on time. As with any project involving several stakeholders and suppliers, there must be a knowledgeable and contactable project manager or external organisation responsible for monitoring progress and organising the work. Installations of one or two charge points may be managed internally without too much additional work. However, installations at multiple locations and with several site hosts must be managed by a dedicated individual or external organisation to avoid mistakes and delays.

2.2.5 Interoperability

Currently several different charge point network schemes are in operation so if car club users are provided with a card to access charge points, it is worth considering whether this card is compatible with other local charging networks where a user might want to recharge. Ensuring that a user has access to local charging networks will increase the usability and range of an EV.

2.3 Back Office

The back office, also called a Charge Point Management Service (CPMS) controls, and controls access to, the charge points. A CPMS is usually hosted on a secure computer server and typically holds data on the locations of and sends/receives commands to and from the charge points on the network.

A charge point is connected to the CPMS via a secure mobile telephone network connection and typically sends/receives commands using a protocol called Open Charge Point Protocol (OCPP). The CPMS also holds information on authorised users (i.e. their membership details) in order to enable charging access to the EV user when the system is requested by the charge point.

The CPMS can also monitor the health of, and can perform some firmware/software upgrades to those charge points connected to it.

2.4 Booking System

Car share membership applications and booking systems are usually online; however, this can exclude low-income households, who are often unable to afford internet access. Whilst there is a growing trend of low-income people accessing the internet on their smartphones, the cost of this is still prohibitive for many. [3]

A feasibility study for Castlemilk in Glasgow found that the majority of residents had internet access, but that this may be intermittent if they cannot afford to top-up their smartphones. [4] To enable these people to use car sharing schemes, alternative booking mechanisms must be made available.

Having the option for people to book over the phone could help to make the car share scheme more accessible, although the cost of this can also be too high for people on low incomes. Providing a Freephone number could help to overcome this problem, but people unable to pay for a short phone call may well be unable to afford to use the scheme.

Car sharing can be made most accessible if people can register and make bookings in person; this could be done in local housing association offices or in local shops, where the shop managers are amenable. However, this would mean that bookings could only be made during opening hours, so would be of limited use in emergencies.

Another potential option would be for residents to book using an electronic kiosk at bay locations. This would have the advantage that the bookings could be made for free (in terms of the process of booking – there would still be a charge for the use of the car). In addition, bookings could be made at any time, meaning that the cars could be used for emergencies and out-of-hours, without needing the member to travel to a shop to make the booking. However, the installation of kiosks would be an additional cost for the operator, and the complexities and risks of on-street infrastructure create a new costs and liability for the operator.

The selected booking system needs to be able to allow adequate time between bookings to ensure that each vehicle booked has enough charge available. Or alternatively, to allocate cars with less than a full charge to bookings that have opted to stay within a designated zone or to restrict the journey to a known mileage.

Ideally, the booking system also needs to be able to monitor the level of charge in the vehicle so that the appropriate adjustments can be made to the charging time allowed between bookings. However, smaller schemes may be less able to afford this technology.

Whatever solution is selected it will need to be linked to the Back Office system to ensure that vehicle bookings are correctly logged against individual scheme members.

2.5 Payment Mechanism

In low-income neighbourhoods, it is important to provide payment mechanisms that do not require members to have access to bank accounts. There are two main ways in which this can be done.

2.5.1 Cash

Members could pay in advance for their use of car share vehicles. This might best be facilitated by one or more locally based organisations collecting payment on behalf of the car share operator. This could be done in a variety of locations, depending on the individual location:

- In the local office of the social housing provider or the premises of another agency delivering local services to the community. This would require them to be set up to handle cash, be set up to provide access the car share booking system, and have an agreement with the operator on the terms of their involvement.
- In one or more local shops. This offers greater flexibility for locations which do not have the offices of a social housing provider or the premises or another agency delivering local services to the community, in the vicinity. However, it would require the buy-in of the shop(s), who would need an agreement with the car share operator on the terms of their involvement, and who might well require payment in return for this service. This would also require the shop(s) to be set up with the booking system, which might be more complicated than offering such a service through a local public-facing office.

If appropriate local arrangements could be made the local office or shop would take cash payment from local members in advance for bookings, make the booking on their behalf, and have funds from bookings collected by the car share operator at the end of each month. Appropriate arrangements would need to be in place to reconcile bookings which exceeded, or were less than, the prepaid amount. Overpayment could be credited to individual users and access could be limited until outstanding amounts were paid off. Existing in-car telematics systems could also potentially be used to notify members exceeding their prepaid amount during a booking.

This arrangement would enable lower-income residents without a bank account or internet access to access car share services without significantly altering the car share operational model. However, members would be required to make their bookings during the opening hours of the office or shop, which would mean cars could not be booked out-of-hours (e.g. for a family emergency in the middle of the night, etc.).

It should be noted that car share scheme are not traditionally set up to process cash payments. A scheme to handle cash will require staff time to process these payments, which will increase the running costs. [4]

2.5.2 Incorporation into an Existing Payment

Members could pay a set fee as part of an existing payment, for example:

- Rent.
- Service charge.

This would have the benefit of not requiring the extra work of cash transactions. However, if residents pay a set fee regardless of their level of car use, this could encourage them to drive more.

Payment could either be charged to all residents or to members only:

- All residents pay. This would encourage higher uptake of the scheme, which could encourage people to drive more, or could encourage residents with cars to sell them by encouraging them to try out a car share scheme they might not have paid to join. However, this would be unfair on residents who did not want to, or were unable to, use the scheme (e.g. if they do not have a valid driving licence).
- Only members pay. This would be a fairer way of charging. However, it would be likely to get a lower uptake.

2.5.3 Credit Unions

Credit unions could have a role to play in offering an alternative to mainstream banking that can be more accessible to low income households, by guaranteeing approval for an account for unbanked individuals. This then gives them access to a debit or credit card that can be used for a car share scheme.

To address the concern about overuse of vehicles that members cannot afford, some operators have worked with the bank or credit union to limit, forgive or shoulder the extra charges. This has resulted in some success in reaching the populations in various cities in the USA (e.g. Ithaca Car Share) [3] who do not have access to regular banking services. However, credit cards could still enable low-income residents to incur charges that they cannot afford.

2.5.4 Prepaid Cards

Some credit unions also provide reloadable prepaid cards, which could be used to book car share vehicles. This would help residents to know how much money they have at any point in time, rather than relying on monthly bills, which is more appropriate for better-off households. However, it is important that money in pre-pay accounts is not ring-fenced for car share only as people on a low-income are reluctant to tie up funds that they might need at short notice.

3 Site-Specific Technical Issues

Investigation and surveys of the individual neighbourhood sites revealed a number of issues:

3.1 Redditch, UK

3.1.1 Booking Mechanisms

High levels of unemployment mean that residents are less likely to be able to afford internet access. In addition, there does not appear to be any free internet access in the local area (e.g. in local libraries). Therefore, it is important that residents can register for the car share scheme and make bookings in some other way.

The survey illustrated that residents would like a range of booking options to be available to them – the primary ones being via smartphone/web and onsite. For the system to be as inclusive as possible, it is recommended that one or more of the businesses in the area are approached to see if they would be willing to accept registrations and process bookings.

3.1.2 Payment Options

The residents surveyed indicated that they would be interested in paying using a range of mechanisms. The most popular payment methods were cash and debit card. Only one respondent wanted the cost to be covered by the housing provider.

A cash payment system could operate in one of two ways: either at a local business (or businesses), or using a machine. The machine would offer the benefit that (depending on the location) credit could be added at any time and would not be restricted by office hours. It is recommended that at least one of these options be investigated. However, the cost of providing this facility would need to be factored into any proposal.

As an alternative to cash payments, it might be possible to explore a partnership with the local credit union, who might be able to provide prepaid cards that could be used for accessing the car share.

3.1.3 Vehicle Choice

If all journeys using car share vehicles are local, then a fully-charged electric vehicle should have sufficient charge for back-to-back bookings throughout the day if it is charged overnight. However, almost half of respondents replied that the vehicles would need to be able to travel longer distances. This illustrates the need to educate members about the range of electric vehicles and the need to charge them on longer journeys.

Survey responses indicate high levels of interest in trying EVs. However, no respondents have ever driven an EV, which highlights the importance of providing induction training sessions to members.

3.1.4 Other Considerations

Survey responses indicate that provision of other types of electric vehicle (e.g. electric bicycles) or bicycles for the hire within the vicinity of the car share parking at/near home and the provision of the internet and public transport booking systems from the vehicles are considered important, and incorporation of these into any scheme will help to make it a success.

3.2 La Coma, Spain

3.2.1 Booking Mechanisms

In order to ensure that the scheme is accessible to residents without internet access, it is important that residents can register and make bookings in some other way.

Survey responses illustrate that residents would like a range of booking options to be available to them – the primary ones being via smartphone/web and telephone. However, for the system to be as inclusive as possible, it is recommended that one or more of the businesses locally (e.g. the market or the chemist's) are approached to see if they would be willing to accept registrations and process bookings.

3.2.2 Payment Options

Further investigation is needed to determine whether it would be better for residents to pay in cash or as a service charge to the social housing provider. However, it is likely that if the cost is fixed, the cars would be used for commuting, which would make them inaccessible for long periods whilst members are at work. Therefore, charging members an hourly rate is recommended.

The majority of those surveyed would like to pay by cash for the use of the vehicles. A cash system could operate in one of two ways: either at a local business (such as the local municipal offices or the market), or using a machine. The machine would offer the benefit that (depending on the location) payment could be made at any time and would not be restricted by office hours. However, the cost of providing the facility would need to be factored into any proposal.

As an alternative to cash payments, it might be possible to explore a partnership with a local credit union, who might be able to provide prepaid cards that could be used for car share usage.

3.2.3 Vehicle Choice

More than half of survey respondents do not have a driving licence (57.1%) and of those who have one, 79% have a licence to drive a conventional car. However, it is noteworthy that 14% of respondents have a type A licence, which suggests that the addition of electric quadricycles or electric microcars within a car share scheme would be beneficial. These types of vehicles do not require a full driver's licence and the allowed age group, in Spain, is now from 16 years. Not only would this type of vehicle expand the potential user base, a full recharge in such vehicles is faster than conventional electric vehicles, at between 2 and 5 hours for a slow charge. Furthermore, while these vehicles are not allowed to drive on motorways, this is not important for La Coma inhabitants.

With the survey results indicating that 24% of residents need to transport children using car seats and 20% of residents have special transport needs, it would be important to assess what these needs are and the impact this could have on any car share scheme. For a car share scheme to be fully inclusive, these considerations would need to be factored in.

Key points to consider include:

- The additional cost. Adapted EVs will be more expensive, particularly as they are relatively uncommon, meaning that it is unlikely that they could be bought second-hand.
- Driving ability. Can residents with special transport needs drive? If not, do they have someone who could drive them?
- Storage, fitting and liability of car seats (for children).
    - Where would they be stored when not in use?
    - Would this limit their availability (if they need to be collected from a manned base) or could they be accessed unsupervised – e.g. using their membership card)?
    - Collecting and returning the car seat would require extra time and effort.
    - Would different sizes of car seat be provided?
    - Who would be liable if a member fitted the car seat incorrectly?

Further consideration should be given to these questions before any scheme is taken forward in this location. It may be decided that the extra cost and logistics make it unfeasible to cater for all of these needs, particularly at start-up – however, accessible vehicles may be key for tapping into the key market of residents accessing healthcare. Funding targeted at accessible transport may be available to make adapted electric vehicles a more viable option financially.

3.2.4 Other Considerations

Survey responses indicate that integration with other transport modes and provision of the internet and public transport booking systems from the vehicles are considered important, and incorporation of these into any scheme will help to make it a success.

Survey responses indicate high levels of interest in trying electric vehicles. However, 89% of respondents have never driven an electric vehicle, which highlights the importance of providing training sessions to members.

3.3 Modena, Italy

3.3.1 Booking Mechanisms

Given the high level of employment, it is likely that a higher proportion of residents on this site can afford internet access. Nonetheless, in order to ensure that the car share scheme is accessible to residents without internet access, it is important that residents can register for the scheme and make bookings in some other way.

From the survey undertaken, residents indicated that they would like a range of booking options to be available to them – the primary ones being via smartphone/web and onsite. For the system to be as inclusive as possible, it is recommended that one or more of the businesses locally (e.g. the post office or the municipal office) are approached to see if they would be willing to accept registrations and process bookings.

3.3.2 Payment Options

Residents indicated that they would be interested in paying using a range of mechanisms. The most popular payment methods were cash, credit card and a rechargeable gift card. Only one respondent wanted the cost to be included in the rent.

A cash or rechargeable gift card could operate in one of two ways: either at a local business, or using a machine. The machine would offer the benefit that (depending on the location) credit could be added at any time and would not be restricted by office hours. It is recommended that at least one of these options be investigated. However, the cost of providing this facility would need to be factored into any proposal.

3.3.3 Vehicle Choice

If the most likely journeys for the car share vehicles are to central Modena (a return journey of 1.4km), it is likely that the vehicles could be charged overnight and still have a sufficient charge for back-to-back bookings during the day.

Of those expressing an interest in using an electric vehicle, the majority would be looking to make journeys of under 30km; this indicates that the range of current EVs would be sufficient for the majority of journeys.

Two of those surveyed stated that they regularly need to transport people with special transport needs, but details were not provided. These needs could include the requirement for adapted (e.g. wheelchair accessible) vehicles, or accessories such as car seats. In order for a scheme to be fully inclusive, these needs should be catered for. However, given the small number of residents who completed the survey and the lack of information on the specific needs, it is difficult to say what would be involved in this, and whether the additional usage would be sufficient to justify the additional costs.

3.3.4 Other Considerations

Only 20% of those surveyed have used an electric vehicle before, although 80% are aware of them. This highlights the importance of providing induction training sessions to members.

3.4 Wroclaw, Poland

3.4.1 Booking Mechanisms

From the survey undertaken, residents indicated that they would like a range of booking options to be available to them – the primary ones being via smartphone/web and telephone. However, for the system to be as inclusive as possible, it is recommended that one or more of the businesses locally (e.g. one of the supermarkets or the post office) are approached to see if they would be willing to accept registrations and process bookings. It may, however, be concluded that the relatively small proportion of residents who would prefer to book this way does not justify the additional effort (and potentially cost) of offering this extra booking option.

3.4.2 Payment Options

The majority of those surveyed would like to pay by cash or credit card. A cash or rechargeable gift card could operate in one of two ways: either at a local business (such as the local supermarkets or the post office), or using a machine. The machine would offer the benefit that (depending on the location) credit could be added at any time and would not be restricted by office hours. It is recommended that at least one of these options be investigated. However, the cost of providing this facility would need to be factored into any proposal.

It should be noted that credit card payments are compatible with making bookings online and over the phone (the preferences of those surveyed), whereas cash payments are not.

As an alternative to cash payments, it might be possible to explore a partnership with the local credit union, who might be able to provide prepaid cards that could be used for car share usage.

3.4.3 Vehicle Choice

Some residents have special transport needs, including requirements for both specialised vehicles (e.g. with wheelchair access) and accessories, such as car seats. For a car share to be fully inclusive, these considerations would need to be factored in. Key points to consider include:

- The additional cost. Adapted EVs will be more expensive, particularly as they are uncommon, meaning that it is unlikely that they could be bought second-hand.
- Driving ability. Can residents with special transport needs drive? If not, do they have someone who could drive them? Would the automatic transmission of EVs make them easier to drive for some people with special transport needs?
- Storage, fitting and liability of car seats.
    - Where would they be stored when not in use?
    - Would this limit their availability (if they need to be collected from a manned base) or could they be accessed unsupervised – e.g. using their membership card)?
    - Collecting and returning the car seat would require extra time and effort.
    - Would different sizes of car seat be provided?
    - Who would be liable if a member fitted the car seat incorrectly?

Further consideration should be given to these questions before any scheme is taken forward. Funding targeted at accessible transport may be available to make adapted electric vehicles a more viable option financially.

3.4.4 Other Considerations

Survey responses indicate that integration with other transport modes and provision of other types of electric vehicle for hire near to the car share vehicles are considered important, and incorporation of these into any scheme will help to make it a success.

Only 14% of those surveyed have used an electric vehicle, although 60% are aware of them. This highlights the importance of providing induction training sessions to members.

4 Public Procurement Considerations

Standard procedures should be used to prepare and invite tenders, to evaluate them and select the successful consortium. The steps are:

- Prepare and publish an Invitation to Tender through an Open Procurement Process or Restricted Procurement Process.
- Receive/evaluate the responses and enter into competitive dialogue if required.
- Select contractor/consortium and prepare to award contract.

Note that it is important to have partnership agreements in place with commercial operators to cover performance aspects of a scheme, including:

- Vehicle type/age and maintenance.
- Customer service requirements (including booking and billing systems).
- Information sharing.
- Marketing, maintenance.
- Expansion.

Partnership agreements provide a guarantee of service to users. They should be evaluated using appropriate performance indicators, and break clauses should be included for poor performance.

4.1 Competitive Dialogue

The Open Procurement Process and the Restricted Procurement Process both require a clear understanding of the requirement to be met, with confidence that the requirement can be met using established products and services available through more than one supplier. The primary purpose of the procurement is therefore to ensure best value for the supply of a commonly understood solution to a need.

In contrast, the Competitive Dialogue Procurement Process would be used where the solution to the problem is not immediately obvious; several competing solutions may exist, or more commonly no solutions currently exist but technology or solutions could be developed to meet the need. Competitive Dialogue works well in that it promotes supplier innovation by providing a guaranteed customer for technology development. It also allows the procuring body to better understand the true state of technology development in the market, and helps to contain ‘supplier optimism’ as any solution proposed will have to be delivered in order to meet the terms of the contractual relationship ultimately agreed.

There is some flexibility in the Competitive Dialogue Process, as it is intended to accommodate complex projects, but in general the process can be considered in three phases:

4.1.1 Pre-Dialogue

A number of steps should be undertaken before proceeding to competitive dialogue with potential suppliers. These include:

- Identify and articulating the need.
- Confirm the business case.
- Produce pre-qualification questionnaire (PQQ) documentation and notices.
- Document the requirement in full.
- Decide on selection criteria.
- Advertisement, possibly in the Official Journal of the European Union (OJEU).
- Assessment of responses.
- Invitation to participate in dialogue.

4.1.2 Dialogue

The structured discussions with suppliers selected through the pre-dialogue phase to develop suitable products or solutions. This may be conducted in more than one phase, providing the process is open and transparent.

4.1.3 Post-Dialogue

The post-dialogue phase is similar to a conventional Closed Procurement Process. A potential solution will have been developed, which may be provided through only a single supplier (in which case a Sole Supplier Declaration will be required) or through more than one supplier. A tender is developed to set out the contractual terms of supply, and once this has been negotiated and signed the procurement process is complete and the project would pass over to contract management.

5 Recommendations

Any local authority interested in introducing an electric vehicle car club should be aware of the following points:

Choose the right vehicles

This is important both in terms of the initial vehicle cost and the attractiveness to potential users.

Make sure that you are making the EV available for suitable trips

EVs are best suited to shorter, urban journeys where there will be no requirement to recharge during the booking. Typical range of an EV will vary depending on driving style, the type of vehicle and other variables such as use of air conditioning/heating systems.

Ensuring that access to appropriate charging infrastructure is available

For car clubs, a dedicated charge point will generally be required for each parking bay so that recharging can occur between bookings. In terms of the type of charging point installed, it is recommended that 32 Amp, mode 3 charging points are installed. Investment in rapid charging technology is likely to be a game changer for car clubs as this will help to ensure that EVs are able to be charged in the minimum amount of time possible.

Develop an appropriate pricing structure that encourages use of EVs

Whilst EVs are more expensive to purchase than standard vehicles, appropriate pricing structures need to be developed by car club operators to ensure that car club members have an incentive to use the EV.

Educate members about EV operation

One of the most significant operational challenges is to ensure that car club members receive an induction or some instruction to ensure that they understand how the EV operates. In particular, this should include information about charging, starting the vehicle, understanding the range available and any warning systems that the EV operates.

Establishing appropriate booking systems

It will be essential to use an appropriate booking system to manage access to charging points and electric vehicles that takes into account the amount of charging time each EV requires so the charge point will not be blocked to other users, and the vehicle has sufficient charge for the next booking.

Managing range restrictions

Restrictions can be placed on the range available for each booking (i.e. a 40km round trip) to help ensure that sufficient charge will be available for subsequent bookings. This can help minimise the need to make use of a charging point during a booking in order to complete the journey.

In an urban setting, bookings can potentially be restricted to a zone or city boundary to manage vehicle range limitations and ensure that even with back to back bookings a car will retain sufficient charge to complete all journeys during the working day.

6 References

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