



City of **HOBART**

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Tasmanian Climate Change Office
Department of Premier and Cabinet
GPO Box 123
HOBART TAS 7001

Email to: climatechange@dpac.tas.gov.au

Dear Sir/Madam

SUPPORTING A STATEWIDE ELECTRIC VEHICLE CHARGING NETWORK CONSULTATION PAPER - SUBMISSION

The following submission represents the comments from a range of officers within the Hobart City Council, including areas of infrastructure provision, environmental management, fleet management and parking technical management. As the period for public comment has coincided with local government elections the comments have not been endorsed by the Council's aldermen.

Background

The City of Hobart supports the development of statewide electric vehicle charging network in Tasmania. The number of registered electric vehicles has doubled in the past couple of years to 29 vehicles in 2016 in the Hobart area¹. The City of Hobart supports continued growth in this sector by demonstrating the use of the technology to the public and by raising awareness of the benefits of electric vehicles.

The City has implemented a range of greenhouse gas and energy saving measures, including installing electric vehicle charging stations and purchasing hybrid electric vehicles, for reducing greenhouse gas emissions by 75% from 2000 to 2010 and saving \$1 million a year in the City's operating costs. Further measures to reduce vehicle fleet energy use and emissions are supported by a target of a 17% reduction in greenhouse gas emissions from 2010 levels by 2020.

Specific measures the City of Hobart has taken to support increased electric vehicle uptake include:

- Installation of a public electric vehicle destination charging station at Hobart Central multi-storey carpark with two ports

¹ Motor Vehicle Registrations, Australian Bureau of Statistics, Regional Statistics by LGA2016, Annual (2010-11 to 2015-16)

- Installation of an electric vehicle destination charging station for use by its own fleet
- Purchase and use of three electric vehicle hybrid 6.5 tonne works trucks
- Purchase and use of two electric hybrid light passenger vehicles

The City is also planning to install two 22kW destination chargers at the Hobart Town Hall car parking deck, with one charger set aside for a planned City owned electric vehicle² and the other for public use.

Further details on vehicle energy saving measures, in areas other than electric vehicle technology, are available from the [Energy Savings Action Plan 2018-2020](#).

In regard to a fast charge station, the Council has resolved to: *“identify suitable locations for the future installation of direct current fast charge stations, and actions be taken to preserve the locations until such time as it becomes viable to install the stations.”*

Electric Vehicle Chargers Challenges

The City has installed some destination chargers, but to enable a statewide network to be developed and thus support electric vehicles becoming a mainstream option there is a need to install public charging stations including suitably located fast charging infrastructure. Some of the issues that the City has identified in the planning and installation of infrastructure are outlined below.

Impact on peak load - Given the potential impact on maximum demand of two 22kW chargers planned for the Town Hall the load will need to be controlled by the building management system to minimise impacts on the site’s electricity charges. This will be managed by the existing building management system.

Visibility and proximity to amenities - It has been identified that the Dunn Place car park may be a suitable site for a fast charge station, given its visibility, being adjacent to Davey and Macquarie Streets, is close to various amenities and has capacity for expansion as demand increases.

Feasibility assessments of additional network capacity - Investigation work is currently underway to estimate the costs of providing a suitable network connection of up to 150 kilowatts capacity at the Dunn Place site with TasNetworks having been engaged to provide a price for such a connection. Where connection costs are high or there is insufficient network capacity there may be potential to use a charging station with a built battery to minimise the peak demand. Such chargers are currently significantly more expensive than those without batteries.

Ownership and management - Once an estimate for the capital costs, including purchase and installation of a charging unit, has been prepared, a report on the Dunn Place site will be provided to the Council seeking direction on its preferred direction with respect to this use of the site. The report is expected to cover a range of potential ownership and management options, from the City owning and operating the system through to seeking expressions of interest for a private operator to utilise the site.

² Planned, yet to be purchased

Compatibility with Parking Meters and Other Charging Stations

Given the proposed location of a fast charge station in Dunn Place car park the issue of how to charge for electric vehicle charging and for use of the parking space has arisen. In addition the issue of credit cards versus fleet cards has also been discussed. Neither of these has been fully resolved, but it is considered that these types of issues could be considered across the State (where relevant) so that a consistent Statewide approach can be developed.

Responses to Questions Posed in Consultation Paper

The following are responses to the questions posed in the Supporting a Statewide Electric Vehicle Charging Networks – Consultation Paper October 2018.

(Q1) Should the Tasmanian Government support the installation of both destination (slower charge) and inter-regional DC fast chargers?

The uptake of electric vehicles is affected by the following factors:

- Perception that there is adequate EV charging infrastructure
- Availability of a suitable range of different types of electric vehicles (not just small sedans)
- Range of electric vehicles (~250 to 300 kms on a full charge)
- Price of electric vehicles is comparable to petrol/diesel (ie not significantly more expensive)
- Electric vehicles being seen as one of the normal options for a vehicle ie familiarity

Of these the provision of EV charging infrastructure is the only one which is within the scope of State and local governments to directly address, though by supporting such infrastructure this would hopefully develop the use of electric vehicles and increase familiarity of this type of vehicle with the motoring public.

The uptake of electric vehicles and suitable charging infrastructure is something of a “chicken and egg” problem. Until there is perceived to be adequate electric vehicle charging infrastructure uptake of electric vehicles will likely be hindered, but until there are sufficient numbers of electric vehicles it won't be financially viable for EV charging stations to be commercially viable, particularly fast charge stations.

It would thus appear that there needs to be some entities prepared to support the initial installation of electric vehicle charging infrastructure until such time as it becomes economically attractive for the private sector.

Some local governments may be willing and have some capacity to support electric vehicle charging infrastructure, even if it is only provision of suitable parking locations, but others may well not have the capacity or have other priorities. Some inter-regional areas must have an electric charger to ensure charging is an option for electric vehicle users moving between the key urban centres across the State.

It is thus considered that the Tasmanian Government will need to provide at least some support, particularly for inter-regional DC fast chargers, which can be expensive, not just for the charging unit but also for the electrical supply.

Destination chargers tend to be significantly cheaper both to purchase and install. Many businesses may provide destination chargers as part of their operations for the convenience of their customers. There may however be “holes” in the network where electric vehicle drivers wish to travel and charge but no businesses or private

operators are willing to provide charging infrastructure without support. For instance some of the more remote national parks may need charging stations within a reasonable range. In these instances there may be a need for support to be provided to ensure there is adequate “coverage”.

(Q2) What factors should be considered in determining what type of charger should be installed where?

The location of electric chargers impacts the type of charger selected, based on the likely time requirements of the users journey and associated tasks. Some of the factors to consider include:

- Likely range of electric vehicles, noting that hilly terrain in much of Tasmania will mean that ranges are potentially going to be significantly less than the nominal range as advised by manufacturers. If ranges are shorter then there may be a need for more fast charge stations or in more locations to enable longer trips in a day.
- Type of vehicle use in areas – for example commuter use or back to base use will likely be more suited to destination charging, while high utilisation vehicles, such as taxis, may require more fast charging capacity.
- Numbers of vehicles and average length of vehicle trips in given areas, as longer trips, particularly those reaching or going beyond the nominal range of a charge. For instance a Hobart to Devonport trip will likely entail at least one charge and for convenience this will likely need to be a fast charge.
- Type of vehicle, model specifications and full or part electric versions– if there are predominately plug in hybrid vehicles in the market charging demand expectations rely on home slow charging arrangements, yet the market is changing rapidly and within a short period of time (next 5-10 years) full electric vehicles are expected be more dominant, potentially increasing the home charge time, which has less flexibility for the user and may lead to greater public charging

Research undertaken by Clive Attwater indicates that in countries with extensive charging networks that about 95-98% of all charging is by destination or slow chargers, so this type of charger will likely comprise the vast majority of charging infrastructure, but that fast chargers will be required for longer trips or certain types of uses.

(Q3) Which locations (for example high-population areas or less-populated regional areas) should the Tasmanian Government consider as the highest priority for installing electric vehicle charging stations?

The answer to this depends on what other entities are doing to provide charging infrastructure. Ultimately high population areas will provide the best economic returns to charging infrastructure owners, but there may be reluctance to invest given the time to make adequate returns. So the first step is to research what has been installed or is planned to be installed.

The highest priority should be to move to a State wide network with sufficient coverage, so this means targeting locations where there are gaps in the network.

If there are some high-population centres where no moves are being made to provide charging infrastructure then these should be a priority target in the short term.

Ultimately there may be some low population areas where provision of charging infrastructure would not be economically viable and there may be need to be some form of ongoing support to ensure there is an adequate network across the State.

Research may be needed to identify future electric vehicles users to further understand the demographics and main uses (be it touring visitors, localised shopping routes or inter regional travel by government departments). Additional analysis regarding likely future purchases and the associated users travelling habits could be undertaken. There will be a need to consider a safety net of stations for emergency use to cover the most frequently used routes in the state and current stop over destinations such as Campbell Town.

Installing electric vehicle charging stations in the most desirable parking spots has the potential to deliver extended marketing and awareness around EV charging station locations and increased social capital for the desirability of being an electric vehicle user.

(Q4) Which amenities are important to have nearby electric vehicle charging stations to facilitate a positive and convenient user-experience?

This would largely be dictated by the charging period. Even fast charging stations will still likely require a minimum of 15-20 minutes to provide an adequate charge, which is significantly longer than filling up a petrol tank.

Destination chargers are likely to be located at sites with a range of facilities or may be hosted by businesses wishing attract or support travellers or for their own employees or fleets.

Fast charge stations will likely need to have public conveniences and should have some form of café or restaurant and potentially some basic convenience retail options in the vicinity. It probably makes sense to install charging stations close to where such facilities already exist. Infrastructure such as seating areas, playgrounds and free WiFi nearby facilitates ease of use could be considered for locations with longer wait times.

Normalising electric vehicle charging via facilities at existing service stations ensures users have the same conveniences as other road users.

(Q5) What type of operation and maintenance issues should be considered to ensure a positive and convenient user experience?

The charging infrastructure needs to be reliable and well maintained, with an availability of at least 99.9% and preferably 99.99%. This could be achieved by having multiple chargers at a site, selecting high quality equipment, having both DC and AC available in case a module fails, failure to “available” when communications are down, comprehensive and responsive maintenance contracts, simple and robust connection and billing arrangements and vandalism deterrence measures.

In terms of operations, there should be readily visible signage (to easily locate the charging station), simple and clear instructions, help lines and call buttons for assistance using the machines while charging, suitable connectors such as CHadeMO and Combo 2 for a wide range of vehicles, and straight forward billing system, with preferably a high level of commonality across the State.

Linking in to digital platforms that allow notifications ahead of time as to availability and wait time helps road users make more informed decisions about which charging station to select, Plugshare for example.

(Q6) What is the preferred payment mechanism(s) for electric vehicle charging station from a user perspective and an operator perspective?

It is considered that billing should be open access with access available to any credit or debit card or via a freely accessible app. Users should not have to have an account with a particular charging service provider, but an operator may offer access through account or fleet cards as well (if chargers can support both credit card and account card systems).

For City of Hobart where it may be providing charging infrastructure within its car parks, it would require that the billing system also would allow for charging for use of the car park, so there would need to be billing both on the basis of electricity used (and a capital and maintenance cost recovery component), but also to recover the standard parking fees for the amount of time the car is in the car park.

(Q7) Should charging stations offer an online booking system?

This is potentially a good idea, particularly during the time when numbers of electric vehicles are increasing, however may be difficult to manage in practice.

As numbers of electric vehicles (EVs) increase, there may be mismatches between the numbers of chargers and times they are available and the number of EV users wishing to charge, if charging infrastructure lags demand. This may result in excessive delays to users. Over time this would be expected to stabilise as charging infrastructure is expanded to meet demand.

Such a booking system would enable EV users to better plan their trips by knowing a charger should be available when they need it.

There would however be issues with any vehicles that have arrived before the booking time and are charging when the vehicle which has been booked in arrives. How is the driver already charging made aware of the booking ahead of time? Are there penalties where the original driver has left the vehicle and is not near the vehicle when driver who has booked has arrived? These issues may make it difficult to manage or police. Some electric vehicle manufacturers and charging network operators, such as Tesla, are already looking into ways of managing this.

(Q8) What are the expectations of users with regards to reliability and availability of installed charging stations and how could these expectations be met?

To support electric vehicle uptake there is a need for EV charging infrastructure to be readily available and highly reliable. It wouldn't take many bad experiences for potential users to be put off from purchasing or using an electric vehicle.

Given petrol stations are highly reliable, it is considered that there would be an expectation of charging stations also being very reliable. As noted above it is considered that 99.9% reliability (ie not available 9 hours per year) of a charging station is a reasonable expectation and it appears that this could be achieved with appropriate selection of equipment and good management using techniques as discussed in the response to Question 5.

Availability is also an issue of supply and demand. Across the State, ideally there would be some degree of oversight by a single body to look at where charging stations are currently located and where there are gaps or insufficient charging infrastructure. This body could then identify and plan where additional infrastructure is required. Such information may then be sufficient for a private operator to invest in

new infrastructure, or alternatively support may be needed to encourage new or upgraded installations. Unless there is to be a single operator in the State then this is probably a role for a State Government or other statewide body.

For individual sites, there would be information collected by the charging station system that the site operator could access and use to analyse patronage and plan for any future upgrade or expansion. As utilization increases, at some point the operator would find it viable to add extra charging stations at a specific site.

(Q9) How important is providing multiple chargers at each site to cover for availability and possible equipment failure.

There is a significant body of research that demonstrates how perception issues with emerging technologies can hinder the expansion of the sector as a whole. This can be as simple as frustration with long charger wait times in the EV sector. The rollout and use of this infrastructure is a key component of how the sector will be seen by the public, with any reputation damage magnified by the attention electric vehicles attract in the media.

It is important that potential customers see that charging infrastructure is available and reliable to support and promote electric vehicles as a viable alternative to petrol/diesel engine cars. As noted in the response to Question 5 operators should provide at least two charging points and offer both AC and DC at a station, in case of failure of a module. Operators should also consider what they may be able to do if a charging station fails completely, such as a mobile charging service and/or towing or carriage of the vehicle to another charging station.

(Q10) What funding delivery model would work best to stimulate potential suppliers to install electric vehicle charging infrastructure in Tasmania and why?

There are three main upfront cost components for individual charging stations, being the charging equipment, the electrical network connection and the parking spaces.

For private operators it is thought that charging station capital, operating and maintenance costs will likely be recoverable over the medium term as more electric vehicles are purchased and utilisation of charging infrastructure increases.

The electrical network connection costs may be high, particularly for fast charge stations and this may well be a hurdle for some installations. It may be necessary in some locations to have a battery in the charging station to manage maximum demand within available network limitations, though this would increase the capital costs associated with the charging unit.

Parking spaces in central urban areas can be very expensive, for example it costs over \$30,000 per car parking space in central Hobart and this could be an issue.

It appears that it could be five years before there is significant uptake of electric vehicles in Tasmania, based on technology development, vehicle pricing trends, and the relatively poor attractiveness of Australia for electric vehicle manufacturers compared to other countries.

Thus investors would typically need to be looking at the longer term and not expecting a return on their investment for this period. For those investors looking to the shorter term, either there would need to be a reduction in upfront capital (such as through provision of grants) or availability of cheap financing for a period such as interest-free or low interest for five years.

Some local governments are looking to support electric vehicle uptake in line with their sustainability strategies and this could involve provision of parking spaces to operators and/or some form of involvement in funding the provision of a network connection. Private operators may see less risk if their investment is in the charging station equipment only and not the fixed infrastructure needed to support it.

Third party funding from the private sector via advertising on the chargers or associated signage could secure ongoing funding if the meters are located in high profile or high traffic areas.

(Q11) What level of funding (eg a percentage contribution to upfront costs) would be reasonable for potential partner organisations/businesses to make towards the installation of electric vehicle charging infrastructure and why?

This is difficult to say what would be needed for investors to decide to proceed and will likely vary on a range of factors. While a fixed percentage is easy to explain and administer, there will likely be a range of percentages for support that would be needed depending on the circumstances.

While the capital cost of a charging unit would be consistent for a given capacity of charging unit the other capital costs could vary significantly from site to site. More remote sites may well incur higher maintenance charges so have lower future returns.

Where network connection costs are high there may be a need to provide a higher level of support for the installation of charging infrastructure to proceed. For example the current TasNetworks support program for electric vehicle charging stations is for 50% of costs up to \$20,000. If a site is going to cost \$40,000 to connect the net cost is \$20,000 to the proponent. If however the network connection cost is \$100,000 then the cost to the proponent is \$80,000. In the latter instance, given all other circumstances are the same, the level of support would need to be much greater to achieve the same level of financial viability.

(Q12) Who should be responsible for ongoing costs and maintenance?

It is expected that in the medium to longer term that a private operator would be responsible for ongoing costs and maintenance of charging infrastructure for "independent" or standalone charging stations, such as fast chargers or destination chargers not tied to a specific business owner.

In the short term this may be an issue that holds back private investors until sufficient use is expected to generate adequate income to cover these costs. It would depend on the expectations and plans of private operators as to whether these costs can be accommodated or whether they would hold off on investments until greater utilization is expected.

Where stations are part of a building or business operation then it should be up to the building owner or business operator to manage the maintenance. They will likely arrange for maintenance of systems with an appropriate contractor.

(Q13) Should fees for charging at a station be based on commercial pricing or be subsidized to some extent?

Ultimately the fees should be based on commercial pricing, at a scale which encourages use of destination chargers over fast charging stations. For fast chargers with much higher capital costs the fee will need to be higher to recover

costs, so would likely be in the order of twice the cost or greater of charging at home or base.

In the short term when there are few users prices will need to be lower than full recovery and set close to the fee expected in the long run when there is higher utilization. Private operators may be prepared to accept a loss in the early years of operation to establish their presence and to build a market.

(Q14) What should the Tasmanian Government consider in raising community awareness of the statewide electric vehicle charging network?

At this time there would appear to be little in the way of drivers for significant investment in community awareness given the current limited availability of electric vehicle models in Tasmania or Australia.

When such vehicles do become available in a price range that could result in significant uptake, then one way could be to provide car dealers which have electric vehicle models on sale with detailed information packs, so that prospective buyers of such vehicles are fully aware of the extent and availability of the network in the State.

There may be a need to raise community awareness more generally, however, this should be targeted at audiences which are most likely to own or use an electric vehicle.

It is noted that many taxi fleets have moved to hybrids and given the high mileage of taxis, the lower running costs of electric vehicles could mean that these fleets may be early adopters. There also may be other fleets where electric vehicles would be cost effective, so maybe working through fleet managers could be an option.

Many road users use digital platforms for searching charger locations, ensure the network is featured on all dominant apps, websites and mapping products. Ensuring signage to charging stations is in high profile locations and the sites for the chargers are highly visible. Behaviour change social marketing techniques such as providing magnetic stickers for cars that have used the chargers, with slogans or symbols that highlight how the charger user has contributed to a better future - based on a range of motivational factors such as environmental savings, cost savings and technology leadership.

If you wish further information or explanation of these comments please contact me using the details provided at the top of this letter.

Yours faithfully



(Scott Morgan)

GROUP MANAGER INFRASTRUCTURE PLANNING