

**Infrastructure Committee
23 November 2017**

Report for Agenda Item: 3

Department: Property & Infrastructure

Queenstown Central Business District Electric Vehicle Fast Charging Stations

Purpose

The purpose of this report is to consider granting a Licence to Occupy over Council owned freehold land to Chargenet Ltd for the first electric vehicle (EV) fast charging stations in the Queenstown Central Business District (CBD).

Recommendation

That the Infrastructure Committee:

1. **Note** the contents of this report;
2. **Approve** a licence to occupy (LTO) for Chargenet Ltd to install, operate and maintain electric vehicle (EV) fast charging stations subject to the following conditions.
 - a. The structure must not compromise roading or services maintenance activities.
 - b. Ongoing maintenance of the structure is to be the responsibility of the Licensee along with any damage that may occur to the road reserve as a result of the structure.
 - c. Location of the Licence to Occupy [as described further in Attachment A] to be over LOT 1 DP 9331, SEC 17 BLK IV and SEC 19 BLK IV Town of Queenstown which is currently being operated as a public car park in the Queenstown central business district.
 - d. Any works within the licence area to be undertaken to the specification and approval of Council's Engineers.
 - e. Licence to be for an initial term of 5 years with 2 further 5 year renewals at Council's sole discretion.
 - f. No rent will be charged for the initial term however any further renewals will be charged for at a rate set by Council.
 - g. Initially 1 EV fast charging station will be installed with 2 car parking stalls marked and signed for EV charging. The initial installation will provide for a second station and up to 6 charging stalls, as detailed in

Attachment A to this report. Increasing the number of charging stations or charging stalls will be at Council's sole discretion.

- h. Should Council require the charging station/s and stalls to be moved within the initial 5 year term, then Council at its cost will identify a suitable alternative location and relocated the facility.
3. **Delegate** signing authority to the General Manager Property and Infrastructure.
4. **Authorise** the General Manager Property and Infrastructure to reallocate \$10,000 of uncommitted Wakatipu unsubsidised transportation budget to a new project to facilitate EV fast charging station installation.
5. **Authorise** the General Manager Property and Infrastructure to determine whether demand justifies increasing the number of EV fast charging car parking stalls and installation of a second fast charging station in The Athol St car park.
6. **Approve** that the current pay and display parking restriction over the Athol St car park does not apply to the EV car parking stalls.
7. **Approve** that district wide EV car parking stalls will be subject to a 60 minute (P60) parking restriction for vehicles capable of being charged by the EV fast charging station, and subject to the operator of the vehicle intending to use the EV fast charging station.
8. **Approve** that the **Prohibited Parking** infringement will apply district wide to vehicles using EV car parking stalls where either, the vehicle is not capable of being charged by the EV fast charging station, or where the operator of the vehicle is not intending to use the EV fast charging station.
9. **Note** that legalisation of new electric vehicle parking signage, its implementation and enforcement and amendments to existing parking restrictions will be the subject of a review of the current parking by-law.
10. **Note** that this report does not prescribe or predict the outcomes of the overarching Queenstown Town Centre Masterplan or other strategies or policies, in terms of promotion, facilitation and implementation of electric vehicles and the infrastructure supporting them.

Prepared by:



Rob Darby
Project Manager

7/11/2017

Reviewed and Authorised by:



Peter Hansby
GM, Property & Infrastructure

9/11/2017

Background

- 1 Hybrid petrol/electric and diesel/electric vehicles have been around for some time but this technology is mostly now obsolete.
- 2 Current production fully electric vehicles (EV) are normally capable of being both slow charged and fast charged using a specific fast charging station. Fast charging stations are relatively expensive and require a 3 phase 80A supply and are therefore unlikely to be used in a domestic application. Depending on the size of the vehicle's batteries a fast charge can take 20-40 minutes.
- 3 Chargenet Ltd is providing a nationwide roll out of electric vehicle (EV) fast charging stations and is offering to cover the cost of supply and installation of these stations. Chargenet operates the stations remotely and handles billing for the service. A smart phone application directs the client to the station location and advises when it is available. Chargenet services are being delivered in conjunction with BMW and the NZ Government. Chargenet's introductory publication is Attachment B to this report.
- 4 Chargenet considers the Queenstown CBD strategically important in terms of a nationwide network and has indicated that it is keen to see a fast charging station installed as soon as is practicable. Chargenet's Wanaka fast charging station is programmed to be commissioned during November 2017. Chargenet is also progressing with a fast charging station location on private property in the Frankton Flats area which is programmed to be commissioned late 2017.
- 5 Currently the closest EV fast charging station is in Alexandra. Central Otago District Council has also approved installation of Chargenet units in Cromwell, Roxburgh, Tarras and Ranfurly.
- 6 The main reasons given for acquiring an EV are significant reductions in pollution, fuel costs and carbon emissions. An EV also has considerably less moving parts and does not require oil and water like a conventional vehicle. Consequently it is claimed that the overall upkeep and maintenance of an EV is considerably less than a conventional vehicle.
- 7 Currently charging an EV within the QLDC is limited to slow charging for 4-10 hours using a domestic 240v supply. Having EV fast charging stations in both central Wanaka and the Queenstown CBD will mitigate 'range anxiety' for EV owners district wide and, of wider benefit to the community, attract visitors to the district who own, or have hired, an EV.
- 8 Currently there are few commercial EVs in the district. The likely reason for this is that commercial vehicles generally need to be available all day, or at short notice, i.e. taxis, courier and trade vans. Having a vehicle on slow charge does not compliment the commercial vehicle general mode of use. Conversely a fast charger should allow a commercial vehicle to be available for use for more than 23 hours per day depending on the total daily mileage of the vehicle. It follows that an EV fast charging stations in the district would allow local businesses to adopt the latest EV technology.

- 9 The Wanaka EV club contends that New Zealand is behind parts of North America and Europe on the uptake of EVs and the infrastructure required to support them. It follows that there will be an expectation to have EVs available for hire by overseas visitors. Not having EVs and their supporting infrastructure available may well lead to reputational damage.

Comment

- 10 Modern EVs have either the European (SAE) or Japanese (CHAdeMO) fast charging sockets. To address this Chorgenet units have two charging cables, one with a European plug and one with a Japanese plug. However, the unit can only charge one vehicle at a time. Importantly the Chorgenet unit is only a rapid charger and cannot slow charge vehicles. This highlights that EV technology has advanced from the hybrid type and will continue to advance and develop with competition in the market. The risks associated with changes in technology rest with Chorgenet. In addition, the agreement with Chorgenet will be for no more than a 5 year term.
- 11 There is variation in the location of charging sockets on vehicles. There are three main locations; centre front of the vehicle, or behind either the left or right rear passenger door. This complicates finding a suitable location for the charging unit. The ideal location is in the middle of 90° parking stalls where vehicles can enter either forward or reverse to minimise the reach required of the charging cables. Parallel parking stalls can work but their use is complicated by the direction of traffic flow and the requirement to park in the same direction. Angle parks where entry can only be in one direction are normally avoided. Extracts from Chorgenet's installation manual are Attachment C to this report.
- 12 The Athol Street car park offers suitable 90° parking stalls where EV fast charging stations can be installed without reducing the overall number of car parking stalls. There is a suitable 3 phase power supply close to the proposed EV fast charging station locations. Initially one fast charging station will be installed and two adjacent car park stalls marked and sign posted for EV charging. However, to future proof the facility it is proposed that a second station is provided for by ensuring sufficient ducting is installed initially. The first station may be able to service up to 4 stalls depending how efficiently the vehicle operators use the station. Installation of the second station would be subject to demand and it is likely that up to 6 stalls could be serviced by 2 charging stations. The charging stations will be mounted on a raised island that is wide enough to provide a suitable wheel stop to protect the stations. There is no particular desire line through this part of the Athol Street car park so conflict between pedestrians and cables will be minimal. The Athol Street car park location is described further in Attachment A to this report.
- 13 The charging units would be branded in QLDC livery which would clearly emphasise Council's involvement in the project. The Wanaka fast charger branded livery is shown in Attachment D to this report.

Options

- 14 Option 1 Do Nothing

Advantages:

- 15 No further expenditure by Council, or use of Council resources.

Disadvantages:

- 16 Potential reputational damage - Council not being seen as proactive or having commitment to sustainable energy and the reduction of carbon emissions.
- 17 Option 2 Install alternate charging units, either slow or fast charge, owned by and administered by Council, or another third party.

Advantages:

- 18 Slow and fast chargers in road reserve may become common place in New Zealand as they are in North America and Europe. Council could have control over all charging and parking of EVs.

Disadvantages:

- 19 High capital expense, unknown financial viability and risk that the technology develops further and detracts from Council's investment.
- 20 Option 3 Install Chargenet charging units in alternative locations.

Advantages:

- 21 Potentially angle parking stalls could be developed for EV charging similar to the situation in Wanaka.

Disadvantages:

- 22 The Wanaka situation takes advantage of existing build-outs in between angle parking stalls. This situation is not readily available in the Queenstown CBD. Installation elsewhere in the Queenstown CBD would likely be subject to increased cost and time taken to secure a location with no surety of success.
- 23 Option 4 Enter into an agreement with Chargenet Ltd for the installation, operation and maintenance of fast charging stations in the Athol Street car park.

Advantages:

- 24 Minimal capital and operational expenditure by Council. Minimal risk to Council as agreement limited to 5 years. Demonstrates Council's commitment to provide for the current and future needs of communities for good-quality local infrastructure.

Disadvantages:

- 25 Potential negative response from local conventional vehicle owners who perceive an overall reduction in car park stall numbers and little value in EV uptake.

- 26 This report recommends **Option 4** for addressing the matter because it offers Council the least risk whilst facilitating the introduction of EV fast charging to the district and does not preclude Council developing alternative solutions in the future.

Significance and Engagement

- 27 This matter is of medium significance, as determined by reference to the Council's Significance and Engagement Policy as it relates to Council's roading network which is identified as a significant asset.

Risk

- 28 This matter relates to the strategic risk SR3 Management Practice – working within legislation, as documented in the Council's risk register. The risk is classed as moderate. This matter relates to this risk because a variety of operational risks (such as meeting levels of service, regulatory compliance and the health and safety risks associated with parties using roads) are triggered when the Council considers whether or not to grant the licence to occupy.
- 29 This matter also relates to strategic risk SR6a – assets critical to service delivery (infrastructure assets) with the risk classified as low. This is because the impact of the occupation is minimal for the public and does not have a significant permanent impact on Council's infrastructure.
- 30 The recommended option treats the risks by ensuring conditions are included in any licence and/or associated agreement which ensure that measures are in place which directly impacts the risk.

Financial Implications

- 31 Although Chargetnet covers the cost of supply and installation of the fast charging units there will likely be Council costs associated with facilitating the installation, consultation, new parking signage development and bespoke livery. It is recommended that \$10,000 of unallocated Wakatipu unsubsidised transport budget be transferred to a new project to facilitate the installation of the fast charging units.
- 32 It is recommended that in the interests of supporting this fledgling green industry, that rent will be waived for the initial 5 year term of the licence however any further renewals will be charged for at a rate set by Council.

Council Policies, Strategies and Bylaws

- 33 The following Council policies, strategies and bylaws were considered:
- Significance and Engagement Policy 2014 – providing clarity on Council's decision making processes and assessing the extent to which individuals, organisations, groups and sectors in the community are affected by the Council's decisions.
 - Long Term Plan – this consideration to grant or otherwise a Licence to Occupy in line with the terms of reference of the Wanaka Community Board

and is considered part of the Council's 'Regulatory Services' outlined in the Plan.

- 34 The recommended option is consistent with the principles set out in the named policies.
- 35 This matter is not currently included in the 10-Year Plan/Annual Plan. The majority of costs associated with this project will be met by Chargenet. Council's costs will be limited to facilitating installation, acquiring knowledge and developing processes to administer EV charging. It is likely that the knowledge and processes will assist Council in developing its long term policies on the matter.

Local Government Act 2002 Purpose Provisions

36 The recommended option:

- Will help meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses by establishing a service that is common place in North America and Europe with minimal cost to the community.
- Can be implemented through current funding under the 10-Year Plan and Annual Plan.
- Is consistent with the Council's plans and policies.
- Would not alter significantly the intended level of service provision for any significant activity undertaken by or on behalf of the Council, or transfer the ownership or control of a strategic asset to or from the Council.

Consultation: Community Views and Preferences

- 37 The persons who are affected by or interested in this matter are Chargenet, local ratepayers, EV owners and suppliers and Aurora the electrical reticulation provider.
- 38 The Council has consulted with Chargenet who are keen to be involved, Aurora who have confirmed suitability of electrical supply and local EV owners and suppliers.

Attachments

- A Athol Street car park EV fast charging station locations
- B Chargenet's introductory publication
- C Extracts from Chargenet's installation manual
- D Example of branded livery

Attachment A – Athol Street Car Park EV Fast Charging Station and Charging Stall Locations



COMPANY INTRODUCTION



charge.net.nz

Electric Vehicle Charging Network

The Company

Founded by Steve West as CEO and cornerstone investor, Charge Net NZ is committed to installing a nationwide network of Electric Vehicle DC Fast Charging stations throughout New Zealand. The primary goal of the enterprise is to promote and accelerate the uptake of electric vehicles in New Zealand. Additionally, electric vehicles are an avenue to energy independence and a cleaner, greener New Zealand..

The Network

A nation-wide network of 100 Fast DC charging stations is planned for installation over the next 3 years in a phased rollout. Installations will initially be in areas of high population density and also in support of key fleet users such as local authorities and car share businesses. In addition to the areas of highest population density and EV ownership, the rollout is targeting the most highly trafficked routes between towns and cities.

These differing needs compete, such that there is no predetermined order of deployment. In practice, the order of installation is determined by the level of support in any given area. This support can be from the local distribution company, local EV owners, or perhaps because a location is strategically important to enable a popular route.

The spacing of stations is optimised so that an EV with a 120km range can reliably reach the next station with an 80% charge, and DC Charging stations are most efficient charging to this level.

There are a certain criteria to qualify each charger location. These include:

- 24 / 7 accessible parking space
- Close to Distribution Transformer with sufficient capacity
- Other facilities close by eg. food, restrooms etc
- Possibility to expand to more parking spaces later
- Supportive host, local government etc

The Charge Net NZ Goal

New Zealand is the perfect market for Electric Vehicles:

- Electricity is generated from 80% renewable resources
- Off street parking is almost universal
- Fossil fuels are imported, retail cost is high
- Average daily commute is low (30-40km)
- EVs are ¼ the cost per kilometer to fuel

However, potential EV customers are scared off by perceived limitations:

- How to drive long distance?
- What if I forget to charge overnight?
- What if I have to make unexpected trips during the day?

Charge Net NZ was founded with the goal of removing these objections, thereby increasing the uptake of Electric Vehicles in New Zealand. Our solution is to provide Fast DC charging stations in cities and towns, and along all major highway networks.



Our Offering

In short, Charge Net NZ offers partners the opportunity to host an Electric Vehicle Fast Charge station at no cost.



Who pays?

Charge Net NZ typically meets all costs for the equipment, installation, car park marking and ongoing expenses such as electricity, maintenance and mobile communication costs.

The unit has its own meter and power connection to the nearest power lines or transformer.

To recover capital and operating costs we bill drivers for the use of the station, charging for the electricity use (25c/kWh) and time on the machine (25c/min). A charging session would generally cost the driver less than \$10. Users sign up to Charge Net Payment and register a credit card. Usage is billed monthly and there are no other fees. The most convenient way to activate a station is via an RFID key fob but users can alternatively activate a charge session using the “PlugShare” smartphone app, via txt message, via the Charge Net website, or even remotely started by calling our 0800 help line.

Hosting

We view the relationship with the hosts as mutually beneficial. The charge station will attract EV drivers to the location and in return the host business is seen to be providing an essential service to the Electric Vehicle community, at no cost to themselves and with very little inconvenience.

Typically our hosts have recognised the benefit of the unit and have provided the location either free of charge or at some very nominal cost (i.e. \$2 per annum).

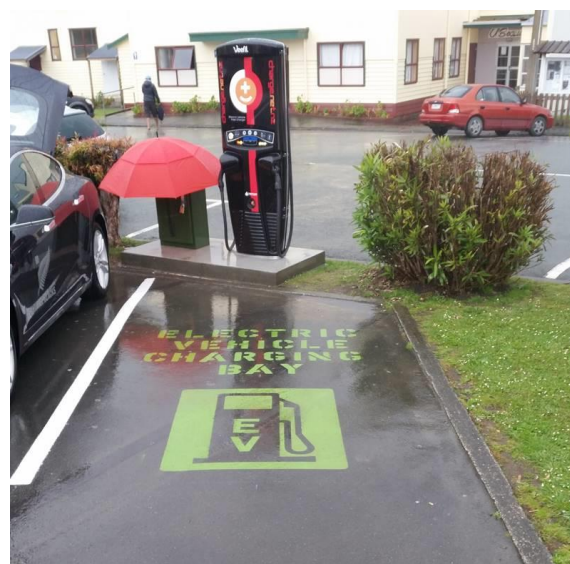
The units suit short stay business models such as cafés, mini market etc. Occupation of the parking space for long periods of time is not envisaged to be a problem as it can be with EV slow charging installations. A typical fast DC charge would be only 15-25min duration.

The Stations

Charge Net NZ have selected the Veefil from Tritium in Australia. It is dual headed, supporting both the Japanese CHAdeMO standard and the newer Type-1 CCS standard. It has a compact footprint (700mm x 330mm) allowing for easy installation behind existing car parks.



At 165kg it is one of the lightest units available, reducing installation complexity and allowing for easy relocation if necessary. Despite its size and weight, it is rated to deliver 50kW continuous DC output. At full power it requires 55kVA of transformer capacity (ie 80A @ 400V). The unit is 2m tall and 0.7m wide (about the size of a door) and approximately 300mm thick. As can be seen in the image (Kaiwaka, north of Auckland), they are relatively attractive units:



Maintenance and Service

Charge Net NZ operates a 24/7 Helpline 0800 2 CHARGE (0800 224 274). Customer queries and operational issues are handled through this contact number.

The units have heavy duty plastic covers over a substantial aluminium chassis. Should the shells be damaged or defaced they can be quickly and easily replaced and repaired offsite. If the unit is subject to more severe damage (car impact for instance) the units can be replaced entirely in a reasonable short timeframe as the installation is very simple.

The units are very low maintenance in service and will generally only require periodic checking of the radiator panel to remove debris and dust build up. The operation of the units is continually monitored via GSM data connection and most faults can be addressed remotely. In rare circumstances it will be necessary to restart the units which will require a site visit by a Charge Net representative.

All maintenance management and costs are met by Charge Net as operational expenses.

Liability

Charge Net NZ maintains insurance policies covering damage and third party liability on a station by station basis.

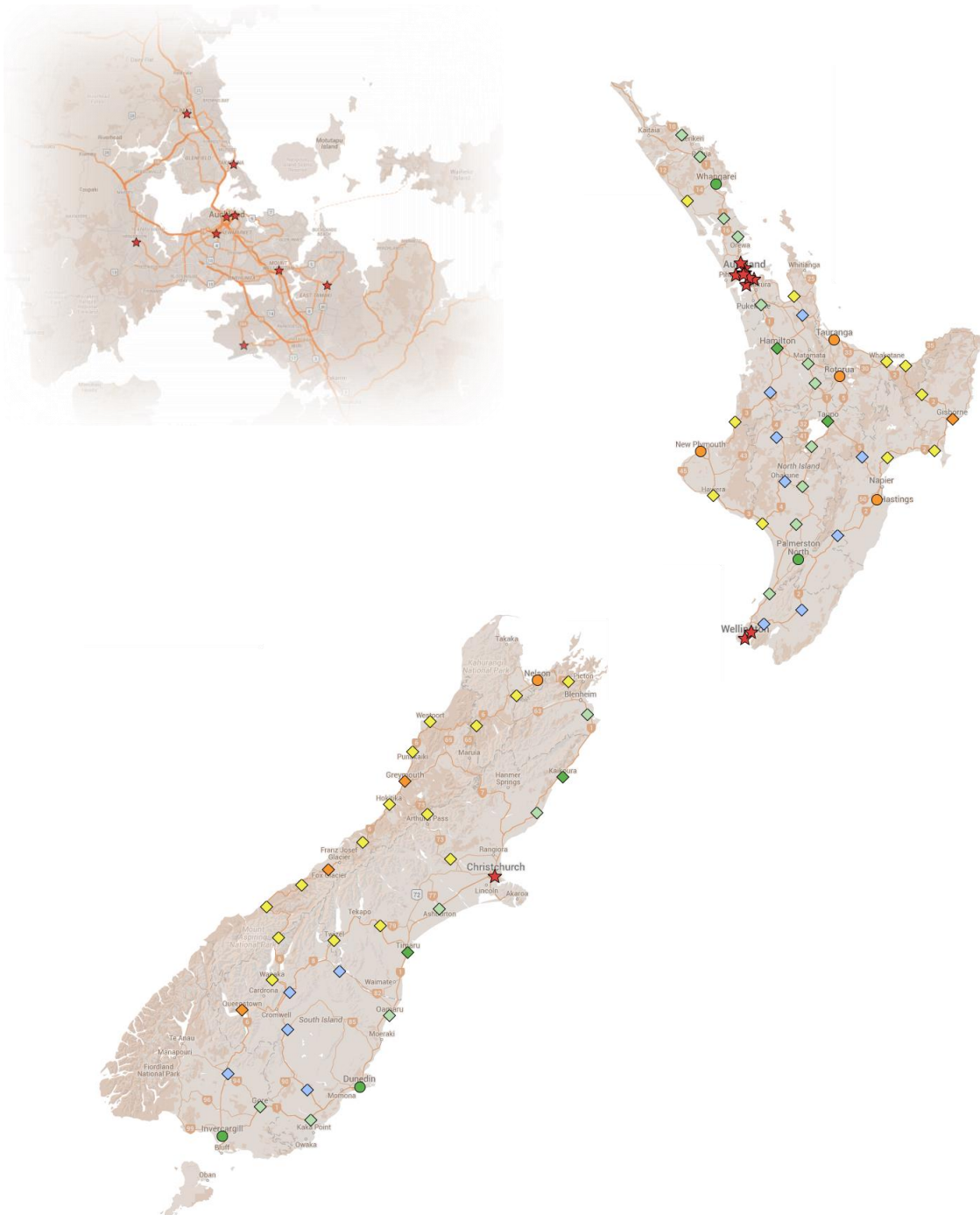
Coverage for total loss of charge unit.

\$5M public liability insurance

Deployment Map

In this map we disclose the planned locations of the charging stations. Diamonds indicate towns whereas Circles indicate cities (pop > 50k). The colours indicate the priority of a route, in order of importance from green, blue, then yellow. Darker shaded locations indicate a hypothetical spacing required for a later generation EV with a much greater range. These would be most suitable for multiple bays / next generation high power stations.

<https://charge.net.nz/charging-map/>



Management Team

An experienced team of business people and enthusiastic Electric Vehicle supporters has been brought together to ensure the Charge Net NZ is a lean but highly efficient business.



Steve West, CEO and Founder

Steve's fascination with Electric Vehicles began as a child, inspired by books painting a future of elegantly simple and efficient personal transportation. Charge.Net.NZ is borne of Steve's frustration at waiting for that future to arrive in New Zealand. He owns three Teslas in New Zealand, P85+, P85D and the only Tesla Roadster.



Nick Smith, Operations

Nick has made a successful career of mechanical design engineering, specializing in consulting to the New Zealand manufacturing sector. In his spare time he is converting a Mazda MX5 to AC electric drive.



Tom Parker, IT Systems

Whether it's reverse engineering a communications protocol, designing a database schema, building secure software or programming a microcontroller, Tom is comfortable negotiating IT systems from the highest overview down to the bit level.



Carl Barlev, board member

Carl is an Electrical Engineer with a strong passion for Sustainability. His career in the power industry started in New Zealand in 2004 before moving to Norway shortly thereafter. In 2013 he took a role with Tesla Motors' managing the installation of Norway's first supercharger stations, and later he continued with Tesla helping with their European expansion into 2014.



Mark Yates, board member

As New Zealand's longest established supplier of EV charging equipment, Mark has taken JuicePoint from strength to strength. In addition he is involved in Wind Farming and Electricity Retailing.

Partners

To improve the efficiency of site selection, we have partnered with nationwide retail chains to host the stations in the most suitable locations to match a 15 – 25 minute charge time. Currently these partners are:

- [Foodstuffs North Island](#)
 - o New World - 99 stores
 - o Pak'n Save – 42 store
 - o Four Square – 203 owner operated locations
- [Z Energy](#)
 - o Fuel retailer, \$2.64B market cap
 - o 200 Service stations
 - o 90 Truck stops
- [BMW NZ](#)
 - o Linked to the Charge Now network
 - o Charging locations 'pushed' to in-car navigation system

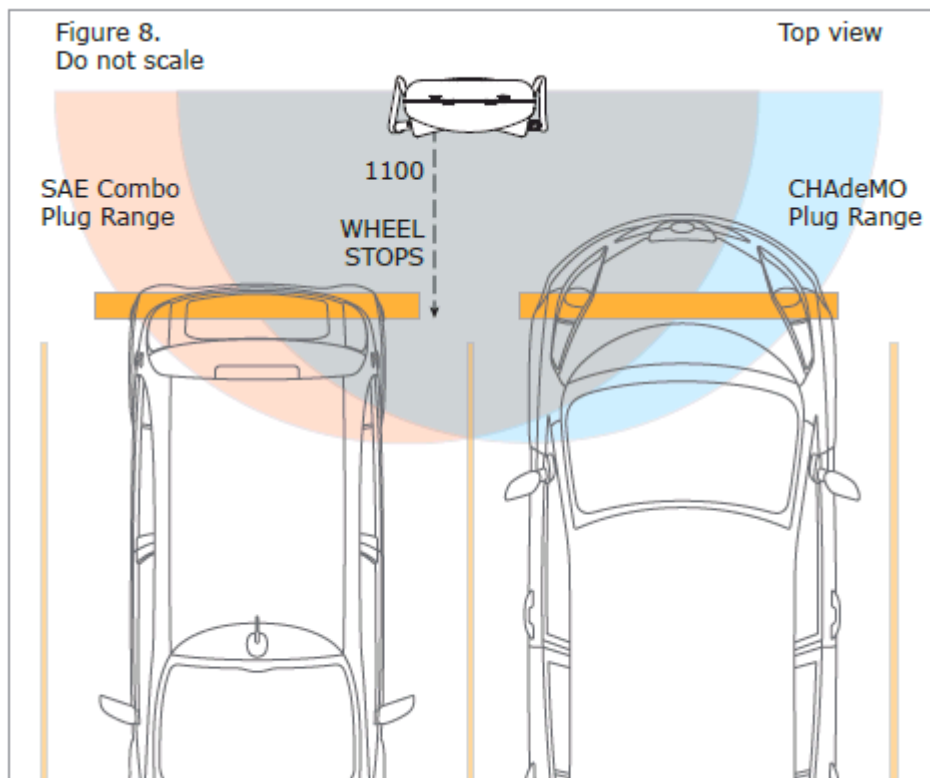
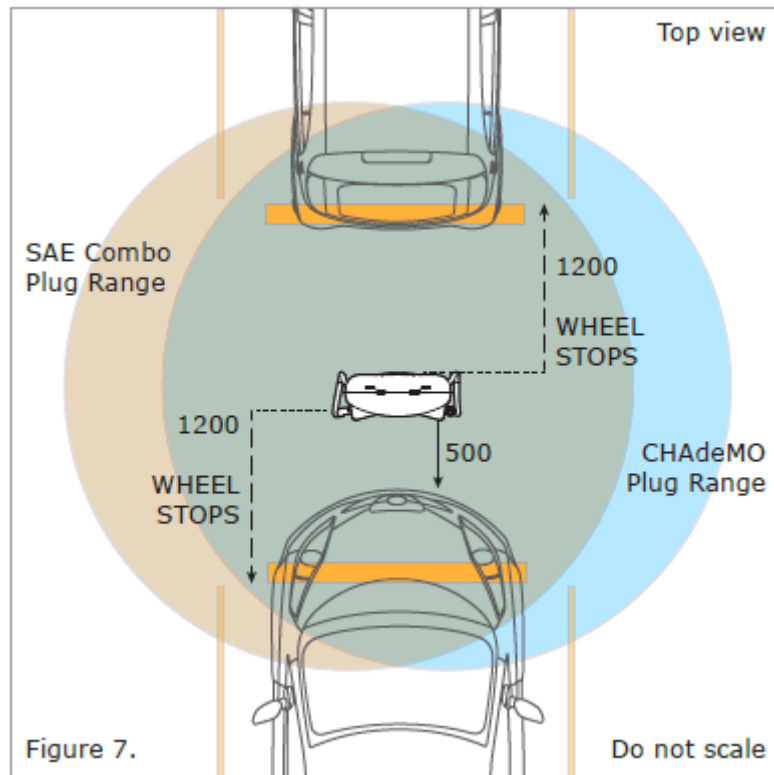
Web

www.charge.net.nz

www.facebook.com/charge.net.nz/

Primary Contacts

Chief Executive	Steve West	steve.west@charge.net.nz	+64 21 450 444
Operations	Nick Smith	nick.smith@charge.net.nz	+64 21 487 982
Stakeholder Relations	Rebekah Rennell	rebekah.rennell@charge.net.nz	+64 21 968 748
Admin	Rachelle	accounts@charge.net.nz	+64 21 968 744

Attachment C - Extracts from Chargenet's installation manual

Attachment D - Example of Branded Livery

