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1 Individuals

Darryl Hanson

Geoff & Felicity Rashbrooke

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Quentin Duthie

Rob Birnie

Robert McCaw

Steven Jones

Terry Cattell

Four additional submissions from individuals have been withheld at their request.

Darryl Hanson
7 Wairere Grove Paraparaumu.

I am not part of an organisation, but am an EV advocate.

Just some quick thoughts from experience on making a better EV charging infrastructure.

My background work in the Military, Electronics and Electrical Industry and Transport Infrastructure.
I have owned and driven an Electric Vehicle for many years.
I have a General Science degree and an Electrical Practicing qualification. I did environmental physics and computer science, that's energy and complex systems.
I also worked for a year selling EVs in Wellington.

My response is not in the form of answering the questions in the consultation individually. I have synergised the answers.

So for your minimal network:

First: double up the existing 50kW and 25kW stations. Or add a 25kW unit beside the 50kW unit, if the power is not available. (around 200 locations exist at the moment) Fill in the gaps on all state highways to 50km apart or better, where practicable (list of gaps below). This will help people wth shorter range cars, to enable them to go anywhere without worrying about getting stuck somewhere. But there will also be two power outlets (or more), so usually you will not have to wait, if someone is there. Upgrade some busy sites to the 75kW chargers that can charge a CCS and Chademo at the same time, reallocate 50kW chargers. It might be a good idea to add a 100kW station to existing location, if the power supply can handle it.

One small concern is that with longer range cars with huge batteries, they may need more time on smaller capacity chargers, so having multiple chargers at each location helps people with new and older cars and larger and smaller batteries. It decreases conflicts between people needing a 5 minute boost charge and a 40 minute full charge.

Decreasing gaps between chargers, means you can skip chargers that are off line or busy, or if you seriously underestimate gaps, you can find a charger. This is important to keep existing shorter range cars going over the next 20 years, and making them an affordable entry point for low income Kiwis to migrate to electric vehicles. I am talking about EV accessibility for the half of the population who never can afford to buy a new car at any point in their lifetime.

Having multiple outlets at each DC charging site helps alleviate queuing. And helps with redundancy if there is a failed outlet or machine. On queuing at a busy charger, I am not a fan of free DC EV charging, it just makes people hog the chargers, especially in towns and cities, rather than charging at home. I like the hybrid payments of charging a low cost per minute connected plus a price per kWh of power delivered, it incentivises only connecting for just the amount of power you need. Charging only for power is misguided (bad California policy). Charging for large blocks of time, like a 20 minute charging session (bad UK pricing), is bad too because it makes people stay longer than they need to get the thing

they paid, for but did not need. In my experience I do a lot of 10 to 20 minus charges on road trips, and a lot of 3 to 10 minute charges to get home, on busy days when I am short of range.

It is important to have the lower capacity machines for the older cars, around half of all EVs in New Zealand are Leafs and they use CHAdeMO, 25kW or 50kW charging, but also Mitsubishi and BMW cars, all cars imported used from Japan have CHAdeMO, so CHAdeMO will need to be supported for 20 years (or more), so all existing vehicles can be used until the end of their natural lifecycle. New stations with multiple outlets can always have, ideally at least two sockets, for older cars, and the new cars can use the other outlets/sockets.

Most EV users don't really consider 25kW chargers to be fast chargers, but they are better than nothing if you are stuck somewhere, you can boost your car with enough power to get to a higher capacity charger, if you have huge battery. Many older EVs don't get much over 30kW on a 50kW charger anyway.

Convenience:
It is important that all EV chargers in the country can be enabled for charging with only one account and activation method. Running multiple accounts and methods to activate and pay for chargers makes no sense, because almost all chargers are already on Charge.Net network. This is a kind of natural monopoly, I am talking about the activation method and accounting. The chargers can be owned by different companies and revenue can go to different companies, but it is a terrible customer experience to have to sign up for a yet another charging network, while taking a trip out of town and you are standing at the side of a road in a snow storm and can't make an account because your phone won't work. (I literally saved a person in this situation driving their new car home from Christchurch to Invercargill in a spring now storm).

The chargers that are commercially available have a communications standard for billing and activation data, there may be two or three standards, but as long as the chargers installed have the right method of exporting their data and account confirmation, it is fairly simple to add chargers from different owners onto a single authentication method to start and bill charging sessions.

Expanding the network, longer term planning:

Then also, put clusters of higher power stations every 150km (125-175km) apart on major highways, to cope with the mainstream longer range vehicles. This 150km is less than half the range of a credible petrol replacement EV with 320km+ range. The kind of range all people find acceptable for daily driving and road trips in New Zealand. High power chargers could be at major petrol stations, or at a road side services centre with some shops with a cafe(s), take away food place, with a 24h toilet. In reality because of power mains requirement, new highway service centres likely will need to be built on suitable powered locations.

These places will be the places where people have it in mind to stop, when planning a long driving trip. A half way stop, or multi stage trip meal stop.

High capacity stations with 6 to 30 power outlets per location, choose some smaller locations too, but have space for adding up a few more chargers for holiday trip and weekend peaks. These would be built like petrol station forecourts. Places like Taupo bypass, Gordonton Road interchange. Turangi, Bulls, Transmission Gully SH58 interchange. Kaikoura. Wellsford. Waipara. Omarama, Alexandra. Lumsden, Milton, Timaru, Palmerston. Especially at junction towns for highways.

There are no perfect ways to place these because you want them at intersections between highways, so that people don't need to back track after visiting one, but they need to be on large power lines or transformers, or near substations. There would need to be some placed in large cities and towns, the towns that already have four or more petrol stations. Some people who have busy days in cities will need charging in cities, taxi and delivery van drivers for example.

Starting soon, there can be new chargers the will need to be installed that have 600W-2MW charging available, but the charger has multiple outlets to server 6 to 30 cars at a time the power is shared dynamically between all the cars. With all these stations there will need to be a proportion of CHAdeMO and CCS, but as CCS becomes more dominant. There can be just a few CHAdeMO outlets per station, for older cars, remember CHAdeMO cars will also be using the small station with just two or three chargers. The 300kW hyperchargers being installed by Charge.Net are a good start, some locations will shortly need three or four, serving a dozen cars for peak weekend or holiday traffic.

Tesla are doing their own thing in NZ, and they might open their CCS chargers for other vehicles to use, but the government should keep out of Teslas model, they know what they are doing.

If the government allows DC charging stations to drop support for CHAdeMO cars, I would suggest that a program be set up to retrofit CHAdeMO cars with CCS, with a subsidy to get vehicles converted, like the old CNG and LPG programme, I am not sure the technical feasibility of this, but BMW can change their vehicles, so it is likely possible for a nominal price. This might be needed a funded research programme (that's the innovation part of your consultation I can identify). Especially for Nissan Leafs because there are so many of them. You will have a bunch of annoyed early adopters and EV advocates that will be upset if CHAdeMO is disestablished as a standard in New Zealand, and that will not help with confidence in an EV future.

For safety and convenience one existing 24h petrol station per town or village should have a double charger (2x CCS and 2x Chademo). This could be 75kW, models to 300kW, but 50kW if that is all there is power for. Places like Levin, Ashburton, Tokoroa, Cheviot. Opotiki, every town or village 50km apart. You need places where the elderly and single people, can safely charge at night. Somewhere staffed 24/7 to assist.

Gaps in the DC network: Haast ,Makarora, Jacobs River, Waitaki River (beach road). Springs Junction, Lewis pass in gerneral. St Anaud, Kohatu, Kawatiri. Whangaimoana (Cape Pallisar road). South Island mountain passes in general.

The places I have mentioned are not a complete list, but I have identified them as being important to make the existing network better. They open routes to lower range cars. And help improve the confidence of all EV drivers, and those considering buying an EV.

My response is concerned with longer distance driving needs. So very little has to be done with AC charging, there are places like car parking buildings where overnight or all day charging is needed, and in city streets where many people live in homes with no drive on parking space, typically older ain inner suburbs.

Darryl Hanson.

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	Geoff & Felicity Rashbrooke

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   Seems ok. Does leave out AC charging; see comments

2. Regarding EECA's objectives for the public charging network:

   Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

   Seem ok, as far as they go!

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

   Probably unsafe to have people driving longer than 180 km at a time, and at least ¼ hour rest desirable (yes, can change drivers, but even so a spell not a bad idea). Broadly I estimate 180 k needs 30 kwh; so that would suggest at least 60 kwh charging.

   As against that, though, some cars (esp Leafs) will get battery degradation from ultra fast charging, so may avoid it. Tend to limit to 80% charge anyway.

So question might be how does cost installation of ultra-fast compare to that of fast chargers. If you can get three fast chargers for 1 ultra-fast, would suggest former prioritised – but have some ultra-fast at 150 k or so points along major routes perhaps.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

Those options look ok.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

Unsure.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

NA

If you have any other comments you would like to include, please provide these below.

We have a Zoe, so only can use AC chargers. Tend to think there is a role for 22kw or 11 kw AC (3 phase 32 amp or 16 amp) because cheap to install and form a backup – but we would say that … One point to watch, from experience trying to use Warehouse 22kw AC public chargers, is that any subsidy needs to have tight maintenance agreements – several Warehouse chargers (eg Hawera, Masterton) seem to have fallen into disrepair.

Final comment is that, as touched on earlier, several fast chargers would be preferable than one ultra-fast charger. An increasing complaint is people rolling up to a charger & having to wait. Even if they don't have to wait as long, it does stuff up journey planning. Of course, if it costs the same regardless of charging speed, then this point disappears.

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Your name, email address, phone number and organisation

Name:	Hari Sundaram
Email address:	
Phone number:	
Organisation:	SELF

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Do you agree with the scope described above? Can you suggest any changes? (Page 7)

Propose consideration of the following for the public destination chargers.

* Consider allocating public sites parking for destination charging. Eg: i-sites, libraries, DoC camping sites - these locations are popular places for visitors to stop and easily expands the existing footprint.
* Consider pay and use service for fast charging and threshold based pricing to deter hogging of sites
* Provide real time updates of charger availability to help planning - queueing is invisible and a major annoyance.
* non-Tesla cars can use some infotainment. Consider screening targeted messages and convenience.
* It will be great if playgrounds have some dedicated parking as parents with kids struggle to entertain kids
* It will be good to have enforcement if EV sites are ICEd

2. Regarding EECA's objectives for the public charging network:

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Objective 6: Enable innovation in new technology and business models

Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

Looks good. Another thing to consider is ancillary support services as charging takes at least 30-45 minutes. Recommend the following objective:

Enable public-private partnerships for enriching customer experience while charging by providing services for toilets, restaurants, entertainment and playground experience.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

Yes. Especially lead the way in remote - but popular tourist destinations.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

Government needs to be creative in leveraging public sites such as I-sites where there is a natural traffic flow, time to explore and infrastructure exists. Partnering with city councils for off street parking and charging would be great option.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

It is a good start

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

No. But as an early adopter have been travelling New Zealand in EV and have lots of ideas.

If you have any other comments you would like to include, please provide these below.

Think wider than just commuters. See how you can rope in with NZ Tourism. Once Covid ends and you have an influx of travellers how can you make EV tourism viable.

High density places will have commercial chargers like ChargeNet or Tesla. People with EV largely evolve to charging at home.

Therefore you need to think of locations that compliments these solutions.

Think of all the public locations that attracts tourists and travellers in low density remote spots. You will be able to provide a great infrastructure that makes visiting spots like Mt. Aoraki or Fox Glacier sustainable and eco friendly.

We have been owners of an electric vehicle for the last 5 years.
We live in Northland and travel to Auckland and beyond to visit family.
We have solar panels and do most of our charging at home, however, use public charges when on longer trips.

NZ does need more public chargers as the EV fleet in NZ increases.

Our points of submission -
1. There needs to be more input heads at existing chargers, rather than closer spacing of the chargers. Drivers must have certainty of space to charge rather than 'hopping over' one charger in use, to the next one, which may also be in use.

2. Journey charging ie charging stations in accessible places on State Highways also needs to be increased if NZ'ers are to rely on EVs for general/ journey use and not just about town.

3. Safe locations are a must.

4. An extended issue would be the promotion of home solar set up for day charging. 3/4 of our charging would be undertaken at home.

Thank you.

John and Jillian Walst
Kerikeri

Submitter information

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Your name, email address, phone number and organisation

Name:	Malcolm Macpherson
Email address:	
Phone number:	
Organisation:	NA

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   Yes. The nature of charging demand will likely change as longer-range cars become more common. Less people hopping across short distances, more people doing longer but occasional (weekend?) tours. Congestion at key waypoints in weekends, holiday periods? So staging the roll-out makes sense.

2. Regarding EECA's objectives for the public charging network:

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   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

   Yes to all, but 5, new entrants, not so sure. The UK may be a good study topic, where there seem to be multiple providers, with a range of tech solutions, and drivers apparently find this confusing.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

   It seems likely that the bulk of the EV fleet will not be able to hypercharge, foe some time, and I'm not sure about prioritising this. I'd like to see the option available at some

key waypoints and in cities, but more 50kW chargers at key locations has a higher priority for me

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

   In many parts of the country, reducing distance between chargers is not an option (I'm thinking of my region – Otago Southland), but more heads at key locations will soon be necessary. Journey chatging is not a priority in this part of the country – chargers are by and large near state highways, easy to find, and in good locations – with space to back in if necessary.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

   Yes

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

   NA

If you have any other comments you would like to include, please provide these below.

None

Submitter information

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Your name, email address, phone number and organisation

Name:	Margaret Baker
Email address:	
Phone number:	
Organisation:	

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Yes

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Objective 6: Enable innovation in new technology and business models

Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

Yes

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

I think they're important going forward as many new EVs have larger batteries, but it's also important to also get more fast chargers out there and to increase the number of chargers at some key locations. This means all bases are covered.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

I think all three options are vital.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

I can see how it would work but I think we need to be mindful of the fact that many people living in areas that may not be deemed economically desirable often have the longest distances to travel. Rural NZ is full of small isolated areas that have no public transport and are often lower down the socioeconomic scale. They are more likely to have older short range cars and still need to be able to charge to get about.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

[Insert response here]

If you have any other comments you would like to include, please provide these below.

There are plenty of gaps in charging infrastructure and Government and local councils need to be doing all they can to encourage and enable charging to be installed. We do not need councils voting against consent for charging installations. Tesla are actively seeking sites for their own infrastructure which should be encouraged as this takes the pressure off the rest of the charging network.

State of charge

Consultation paper on developing a short-term roadmap for the public electric vehicle charging network

EECA is seeking submissions on proposed approaches for identifying locations for public fast EV charging infrastructure and how to prioritise those locations. This will enable EECA to develop a roadmap of the future roll-out of the public EV charging network.

Please provide your feedback by 5pm, 26 November 2021.

When completing this submission form, please provide comments and supporting explanations for your reasoning where relevant. Your feedback provides valuable information and informs decisions about the proposals.

We appreciate your time and effort taken to respond to this consultation.

Instructions

To make a submission you will need to:

1. Fill out your name, email address, phone number and organisation. If you are representing an organisation, please provide a brief description of your organisation and its aims, and ensure you have the authority to represent its views.

2. Fill out your responses to the consultation paper questions. You can answer any or all of the questions included in the consultation paper. Where possible, please provide us with evidence to support your views. Examples can include references to independent research or facts and figures.

3. If your submission has any confidential information:

    i. Please state this in the email or letter accompanying your submission, and set out clearly which parts you consider should be withheld and the grounds under the Official Information Act 1982 (Official Information Act) that you believe apply. EECA will take such declarations into account and will consult with submitters when responding to requests under the Official Information Act.

    ii. Indicate this on the front of your submission (e.g. the first page header may state “In Confidence”). Any confidential information should be clearly marked within the text of your submission.

    iii. Note that submissions are subject to the Official Information Act and may, therefore, be released in part or full. The Privacy Act 1993 also applies.

4. Submit your feedback by:

    i. Emailing your submission to publicevcharger.roadmapconsultation@eeca.govt.nz

    ii. Mailing your submission to:

    Consultation: Public EV charger roadmap

    Evidence, Insights and Innovation

    Energy Efficiency and Conservation Authority

    PO Box 388, Wellington 6140

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	Peter Hallinan

Email address:	

Phone number:	

Organisation:	n/a

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   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

yes and no.

2. Regarding EECA's objectives for the public charging network:

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   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

yes. Would like to see some cross-referencing to the Treaty of Waitangi.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

thorny issue. That's probably the way the field is headed in the longer term. In the shorter term, shorter range EV's (not just the Leaf) make up a significant percentage of the current EV market and should not be ignored. In my own case, I bought a Toyota Prius hybrid as soon as it came on the (Australian) market about 20 years ago, then switched to the BMW i3 REX in 2014, then switched to a full EV (Kia e-Niro EX455 in 2019). In ahort, both ends of the market need to be catered for right now. I've heard internet gossip that Tesla fast chargers may be configured for other premium brands. If so, great, let the market reign, and put governmental priorities towards the lower end of the market.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

In my opinion, the benefits outweigh the risks. We need to avoid encouraging "charge rage" at all costs. I'd like to see chargers installed (bearing in mind the 3 options listed) at roadside restaurants, supermarkets of all brands, at tourist spots featuring short bush walks, and any other location that offers drivers short breaks while their vehicles are being charged. For example, The Store at Kekerengu, between Kaikoura and Marlboerough on SH1.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

[Insert response here]

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

As a retired academic, I just can't help myself! :) Apologies in advance if you're already across some or all of the following:

I'm sure you know the Waka Kotahi guidelines, but just in case... see: https://www.nzta.govt.nz/planning-and-investment/planning/transport-planning/planning-for-electric-vehicles/national-guidance-for-public-electric-vehicle-charging-infrastructure/setting-up-public-charging-infrastructure/installing-a-charging-station/

ChargeNet are our current major supplier. I'd invite a submission from them.

https://www.sciencedirect.com/science/article/pii/S1877050919316618

https://www.fleetcarma.com/ev-charging-stations-choosing-best-locations/

Scotland's model:

https://chargeplacescotland.org

Australian example. Their list of providers may be useful.

https://electricvehiclecouncil.com.au/about-ev/charger-map/

How Michigan, USA, does it:
https://www.michigan.gov/climateandenergy/0,4580,7-364-85453_85455-487842--,00.html

Don't overlook business opportunities...

https://blog.evbox.com/make-money-ev-charging-stations

https://www.pwc.com/us/en/industries/industrial-products/library/electric-vehicles-charging-infrastructure.html

A 2014 handbook from Vermont, USA:

https://www.ccrpcvt.org/wp-content/uploads/2016/01/20140626-EV-Charging-Station-Installation-Guide.pdf

If you have any other comments you would like to include, please provide these below.

[Insert response here]

Hi,

Please see below for my feedback on the consultation paper. Our family owns 2 EVs and have had an EV for 3 years. I am happy to provide my experiences and be involved further, if needed. WLG based.

Yours,

Peter J

Your name, email address, phone number and organisation

Name:	Peter Johnson
Email address:	
Phone number:	
Organisation:	n/a

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

Do you agree with the scope described above? Can you suggest any changes? (Page 7)

Yes, scope is a good starting point.

2. Regarding EECA's objectives for the public charging network:

Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

Objective 2: Provide all users with safe and convenient access to charging infrastructure

Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

Objective 6: Enable innovation in new technology and business models

Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

Yes, I agree but I would also like to see more "education" of the general public in dispelling the myths around EV ownership.

3. Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)

No, not at the expense of providing more 50kW chargers (both charging heads per unit and number of locations). In Oct 21 we (NZ) imported 207 Nissan Leafs (out of 244 total used EV imports) and the following new EVs - 136 Kona, 98 MG 25, 96 Model 3s – by concentrating on the high ultra-fast charing you are going to exclude the majority of EV owners. It could create the situation where it could be perceived that "the govt are supporting the rich folk who can purchase flash new cars" whilst ignoring the other elements of society, where the majority of EVs ownership has significant financial benefits and removing older more-polluting vehicles off the road.

4. Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the

number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)

Risk – expensive and complex

Benefit – a more comprehensive charging system

Priority 1 – increasing number of charging heads (reducing potential of queuing – queueing is the biggest pain and concern)

Priority 2 - reducing distance (give options should there be a long queues)

Priority 3 – Prioritising journey charging (the realistic number of journey charges for the majority of EVs is 2-3 per day (this avoids heat build-up in the battery which prolongs life)

Overall – **worth doing** – I suggest the following to increase capacity and options at a very affordable option.

Additional Methodology to increase location charging options for drivers

Most people don't use in-journey charging (your report states only 13% of charging is done at public chargers) therefore, we should also be looking at how to provide a similar service when away from home. Encouragement and education for hotel/motel/AirB&B owners to provide a "trickly charge" (1.6-3kW) overnights – café car parks as locations for Type 2 charging (3kW) – by increasing these options at relatively low cost (the building electrical infrastructure would not need upgrading, just external power points – not expensive to install) gives more options for lower capacity EVs (the cost of electricity is also minimal – but I suspect most building owners do not comprehend the lower cost of power than is needed. I am happy to pay $5-$10 to "fill" the EV overnight (it's a 40kWHr vehicle) slowly and it will still be less than a "Chargenet" 50kW cost (it is also better for battery life and makes the next day's journey easier to plan). Perhaps pay for the trickly charge using a EFTPOS payWave or use the existing Chargenet payment system. Let's make it easier for the customer.

What do the majority of EVs get used for?

Given the current fleet, most EVs get used for short journeys (most light vehicle journeys are 25kms or less Link)- therefore, how do we enable those journeys to ensure maximum uptake of EVs. Work with employers to make EV charging a work locations easier (even Type 1 or 2 charging) education for the real costs of power, perceptions around Fringe Benefit Tax implications, costs of installing low

5. Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)

Data Driven – yes, agree. Let's ensure that the "customer" (EV drivers and potential EV drivers, work fleet managers) are provided with the best information to reduce the barriers to entry (for new EV drivers/employers)

Digital Twin - The "digital twin" concept is new and exciting, however, I don't think the benefits have been articulated clearly and could be resource heavy ($ and/or personnel) at the expense of actually improving the experience and uptake of EVs. What does digital twin success look like? – it's not clear and I would want to see a lot of public money thrown at a concept that delivers …. what? Digital Twin is a new "buzz word" in the IT/CIS/AI world but I don't see this as the biggest problem. EV ownership increase is about "people" and their vehicle choice decision making.

6. Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)

N/A

But I have been planning longer holiday journeys – I just use ABRP (A better route planner) for planning and the chargenet App for more "what is available now" en-route checking.

If you have any other comments you would like to include, please provide these below.

Increase of light EV ownership and operating is about influencing people – either individual family choices, light fleet owners/managers, locations owners (to encourage new charger location options) and power bill payers (the real cost of power is really small, but I don't think that many people know how many kWHrs a vehicle takes, or how much a kWHr costs (or even understand the difference between a kW and kWHr).

Data driven evidence is good to dispel some of the myths, but it's still about an emotional decision at purchase/rental.

Therefore, another strand should be about how to increase public charging options easily (hotel/motels) with little to no cost by influencing those who make those decisions.

Kia ora

My input is to ask that your consider the viability of including AC type 2 sockets as part of or I conjunction with each DC charger installation. As an example, this has been done recently at Days Bay in Eastbourne, Lower Hutt.

I drive a low range Nissan Leaf. While such EVs will become proportional lesa of the national fleet, these early adopters will still be around for a while. And newer EVs will eventually have degraded lower range batteries. Such cars will often be used as city only cars, but as charger network expands they can be used more for longer distance, perhaps displacing some people's need to own a second (often ICE) car.

Stretches like Masterton to Woodville are difficult in a low range EV. While mine has a 100% range of about 100km, its practical fast charger to fast charger range is really only 60km if you discount the last 20% as buffer for conditions such as head wind or wet road, and fast charging is only practical to 80% in a older charge-resistent battery. Above that it becomes impractically slow, costing too much in time fees and heating up the battery too.

The type 2 sockets at Pūkaha Mount Bruce are good at filling the Masterton-Woodville gap, but they are only available during opening hours. Hence I am unable to use this stretch of SH2 at present without undue range risk.

Having more type 2 sockets would have benefit of assisting older EVs in such situations, take some pressure off increasingly busy rapid chargers, encourage no-hurry destination charging patterns (that often go hand in hand with spending time in a place supporting the local economy), and allow older EVs to top up to 100% before heading to remote destinations off the highway, such as into the mountains for a tramp (often uphill) or to remote settlements or beaches (often 50+km of windy roads from the highway). I understand AC chargers are not nearly as expensive to install as a DC charger.

While this may be on the edge of the scope of your project, please consider if there are opportunities to promote more type 2 sockets as part of the spatial planning and DC installation roll out.

Happy to talk further if useful.

Quentin Duthie

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	Rob Birnie
Email address:	
Phone number:	
Organisation:	

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

Do you agree with the scope described above? Can you suggest any changes? (Page 7)

While I support fast public charging, I believe this terminology needs to be considered critically. 50kW charging is not "fast" for any new EV being released today. I would recommend looking very closely at further investments into outdated technology supporting 25-50kW chargers, as spending a limited pool of funds on this sort of charging will disincentivise consumers ("charging is so slow") and obstruct the installation of high speed charging facilities supporting 100kW+ per vehicle. I believe EECA need to consider very carefully the data on which they are choosing to make these decisions. Surveying EV owners, many of whom do not have brand new vehicles, will skew charging trends towards the most populous EV in New Zealand, the Nissan Leaf, a vehicle which is notorious for its reliance on destination and journey charging. Contrast this to modern EVs, for which journey charging is almost irrelevant (for reference, in two years of owning a Tesla Model 3, I have spent about $250 on public charging, with the rest on private chargers). Investment into public charging infrastructure should be focused around vehicles which will be undertaking long range travel, not around vehicles which are, for many, a "second car", in the same way that the highway network is designed for long distance vehicle travel, and not for the convenience of moped riders.

2. Regarding EECA's objectives for the public charging network:

Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

Objective 2: Provide all users with safe and convenient access to charging infrastructure

Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

Objective 6: Enable innovation in new technology and business models

Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

I support these Objectives. However I believe Objective 3 should be highlighted as particularly critical. We must not fall into the trap of allowing a fragmentation of the charging network, as is seen in the UK, Europe, and the US. New Zealanders will be put off by requiring multiple accounts, multiple fobs, and having to memorise different pricing schemas will make current fuel pricing look quite reasonably by contrast. The government MUST ensure standardisation, so that one key fob, and one account, is all that is required. Consider how ATMs can be used by the customer of any bank, with no associated fees. This is the point we must be at with charging infrastructure. We already have a massive advantage with ChargeNet providing almost all the infrastructure, we should take advantage of this and standardise to one single system that other providers must hook into. We have the ability to set up charging system similar to the way EFTPOS was set up many years ago, creating a huge public asset that all New Zealanders benefit from.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

Yes. Without question. Private home charging and destination charging do not require government investment. Home owners and businesses will take care of this (though requiring new homes to consider EV charging requirements would be ideal).

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

I strongly believe that prioritising number of charging heads at each location, and prioritising journey charging is the most critical element to creating an electrified New Zealand. There are some basic reasons for this. If I stop at a destination to charge, I want to be able to charge there, I don't want to have to drive to another two or three locations looking for a charger that isn't occupied. Multiple heads increases the likelihood that one will be available for me, or in the event they are all full, will increase the likelihood that someone will finish charging soon. It will also likely yield some benefits in terms of installation and ongoing maintenance. Prioritising journey charging has already been discussed, but my basic view is that as time moves forwards,

less charging will be done at destination chargers and in an opportunistic fashion. Therefore, investing in chargers to support longer journeys is most critical, which multihead charging units do best. The resiliency of having multiple chargers in one location avoids issues with drivers arriving at a charger and getting stuck due to a queue of other cars, or a failure of the charger itself. While power failures will also likely occur, this is already an issue with petrol stations, and does not cause serious issues in all but the most extreme scenarios. It is unlikely to be an issue with EVs for very long, due to the rapid acceleration of battery technology enabling longer ranged vehicles, meaning a reduced likelihood of ending up at an offline charger without the range to reach a new one.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

I support such an approach, as long as consideration is given to not just the existing fleet, but the future fleet. Lets not design a "data driven" approach that prioritises charging infrastructure for short range, slow charging EVs, when these will be a minority in the country within several years. Given the number of new EVs now being imported into the country, the range of these vehicles, and the very significant limit on the number of used, short range EVs that can be imported, my prediction above is already well on the way to being true, so I would ask you to please not overlook this critical point.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

No, however I would suggest engaging with the EV community, as we know a lot of the locations that need chargers. Mokau and New Plymouth are sore spots, the Wairarapa has only two fast chargers and more fast chargers supporting the West Coast of the South Island would also be ideal.

If you have any other comments you would like to include, please provide these below.

[Insert response here]

Submitter information

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Your name, email address, phone number and organisation

Name:	Robert McCaw
Email address:	
Phone number:	
Organisation:	n/a

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   Yes however I strongly believe that the timeframe needs to be dramatically shortened.

2. Regarding EECA's objectives for the public charging network:

   Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

   Support. Consideration should be given to retaining the excellent seamless ness of using one fob (currently ChargeNet) through most of the country. I'm not saying shouting out competitors but an overall activation system is great. Contrast this with the mess in the UK where you need a plofera of apps, contracts and fobs.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

   I think more chargers at more locations is a better investment than a few high capacity chargers until a high proportion of the fleet is electric.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

There are many benefits in reducing the distance between chargers and increasing units at each site. Principally it removes the common argument that low range cheaper cars are only useful as 2nd cars but can be the only family car.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

While I understand the desire to have a data based plan, however if we really want faster uptake of EVs then the ability to travel easily and without stress about fuel supply is extremely important. It means that in many places it will be some years before there is a financial return so we can't expect the private sector to install the required infrastructure. However without that infrastructure the uptake in BEVs will be delayed for a longer period.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

N/A

If you have any other comments you would like to include, please provide these below.

Thank you for the opportunity to submit on this important issue.
My Background:
2 years ago we purchased a Hyundai Ioniq elite with a range of 200km (150km on a rapid charger). We live in Picton and have traveled to Oamaru, Hanmer Springs, Golden Bay and Hawkes Bay.
We have made a return trip to Christchurch in 1 day.
We have used the EV and stayed in cabins as an option to using our Campervan thus reducing the amount of CO2 however there are 3 areas that we are unable to navigate in the South Island due to lack of chargers despite having an expensive mid range car. They are SHW 63 Picton to Murchison, SHW 7 Murchison to Culverden and SHW 6 Franz Josef to Wanaka. 2 of these are major tourist routes and the Wairau Valley substituted for SHW 1 after the Kaikoura earthquake.

Also many of the rural chargers are single units and if one fails (not unusual) a route suddenly becomes unavailable. In late December 2020 we were charging at the Cheviot charger when the unit failed. Fortunately we had enough fuel to get us to Amberley however I became aware that a Nissan Leaf had to arrange a tow truck to take it to Christchurch. There is NO way that ‘fence sitters’ will convert to EVs while that is still the risk.
I completely understand that the business case for the private sector is not there for increased capacity yet which is why I believe that the taxpayer has a role in this roll out.

I would like to submit comments on public DC chargers. I have owned a 2015 24kwh Nissan Leaf for 2.5years and have travelled about 23000km.

The biggest 2 annoyances on the present public chargers is their awful choice of locations and in quieter locations single chargers simply present too big a risk to use an BEV.

To clarify point 1. Chargers are often located in strange out of the way locations like say Waikanae beach. This means I have to drive away from SH1 several Kms to find and then charge and then return to SH1 to continue my journey this frankly is an insane location to choose. The charger should have been just off SH1 at the main junction.

To clarify point 2 Waikanae beach has a single 50kw charger there is no redundancy for failure or if occupied. This isnt usually critical unless you are driving to the Ferry then having to wait 30mins for someone else to charge means either leaving early or risk missing the ferry. The same problem applies to the Marlborough region. We would love to visit family but a single charger at Havelock means we have to use our ICE or hire an ICE or not go as the risk of being unable to get back to the ferry is too significant. The same issue applies as you go past Nelson, single chargers make the risk and hence stress too great, will use ICE.

I see there is some proposal for 175kw and 300kw chargers these seem a waste for the vast majority of BEVs. Most afforable BEVs seem to have a maximum charger rate of 100~120kw (many are less) hence rather than one 300kw charger two 150kw chargers would seem of a lot more sense at this stage of the S curve. or even 3 x 100kw.

Consultation document

Point 1, I think my above comments cover this.

Point 2, Partially, mostly covered above I think.

b. Safety, yes, well lit & CCTV coverage.

e. Not so sure as if you look at the UK it is a mess of different companies. (Evidence - youtube EV bloggers) Having just one though as a monopoly is a concern.

f. Yes, though there seems to be evidence of lockins and lack of choice say VW pushing a monthly subscription in Europe even if you use a public charger or not. If you dont pay that then you pay a lot more.

Point 3, As above, no very much not, quantity of chargers.

Point 4, Pick better locations for transit charging close to main State highways and/or have some sort of standard sign pointing to the charger location. Square blue background white arrow and EV sort of thing.

Point 5, Yes seems OK, as long as you know how to actually model.

Point 6, na, personal experience only. Queuing is OK usually unless time constrained.

Regards

Steven Jones

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	Terry Cattell
Email address:	
Phone number:	
Organisation:	

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   Yes. But also and in the medium term (about 10 years)

2. Regarding EECA's objectives for the public charging network:

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   Objective 2: Provide all users with safe and convenient access to charging infrastructure

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   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

   Yes. But I would specifically say 'public electric vehicle charging infrastructure around the whole of New Zealand'. i.e. that there are electric vehicle charging stations at suitably close intervals so that they can be reached by at least medium range evs.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

   Not necessarily. There are areas of the country that do not have any fast charging stations, or have just one that is a bottleneck where people have to wait to charge. This queue situation will only get worse as more EVs come onto our roads.. These areas may not be suitable for high-power ultra fast chargers, so my priority would be to add more fast charge stations in suitable locations.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

If a distance of 75 km between chargers is the aim, then I don't think the distance between them needs to be reduced.

But in order to stop the times a car has to queue to charge (bearing in mind that each charge will be in the region of 20 minutes plus), the increasing of the number of heads at existing locations would save a lot of annoyed drivers!

Prioritising journey chargers to be near major roads is good for long fast journeys, but not for travellers who want to go 'off the beaten track'. For example sales reps or farm consultants who spend their time travelling between customers in an area of the country.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

One issue I can see with the data driven approach is the elapsed time that will be required to collect real time data! You might be near the end of the 5 year time period than the beginning before any useful information can be collected.

We need chargers in at least some underrepresented areas much sooner than that.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

No – I am a private individual (although I do have a long IT background)

If you have any other comments you would like to include, please provide these below.

There are areas of the country (e.g. New Plymouth) where it is currently impractical to take electronic vehicles because of the lack of ev charging points available in the area. This must be detrimental to their businesses, and to EV drivers.

2 Charger manufacturers and service providers

ABB ChargeNet

Hikotron Limited

Zenobe

Energy Efficiency & Conservation Authority (EECA)
Wellington
New Zealand

BUSINESS AREA	ELECTRIFICATION
FROM	Ewan Morris
PHONE DIRECT	+64 9 362 1261
E-MAIL	Ewan.morris@nz.abb.com
DATE	November 18, 2021

EECA State of Charge – Public EV charger roadmap

Dear EECA,

Please find enclosed our submission regarding the Public EV charger roadmap.

Yours sincerely,
ABB Limited

E. I. Morris

Ewan Morris
Country Managing Director,
Local Business Manager, Electrification

ABB Limited
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1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 8)

We agree with the scope of the document and believe that the elements of the scope focus on the important EV charging infrastructure topics.

2. Regarding EECA's objectives for the public charging network:
   a. Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure
   b. Objective 2: Provide all users with safe and convenient access to charging infrastructure
   c. Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met
   d. Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment
   e. Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers
   f. Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 10)

We agree with the objectives 1 to 6. Feedback regarding specific objectives are:

Objective 4: a well defined roadmap will assist EDBs with long term planning for the future requirements of key electricity infrastructure assets, for example, sizing and location of sub-transmission level substations and distribution network strengthening including upgrades to MV Switchgear and LV Switchgear and Distribution Transformers.

Objective 5: we support the objective to encourage new entrants and competition as this will drive innovation and lead to new business models.

Objective 6: we support the objective to enable innovation as this could help to develop solutions for specific use cases. For example, new technologies are in development that could help to solve some of the technical & commercial challenges associated with providing EV Charging Infrastructure in remote off-grid or grid constrained locations, such as Hydrogen Fuel Cell powered DC Fast Chargers.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 16)**

We believe that the government should prioritise its investment in high power ultra-fast chargers due to the following reasons:

1. **Ultra-fast chargers will provide the greatest public benefit for journey charging**
2. **Nevertheless, due to the relatively large capital investment required for these types of chargers and associated infrastructure, government co-funding will be required to encourage private investment**

4. Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 16)

We believe that the government should prioritise options 2 and 3 i.e. increasing the number of charging heads at existing locations and prioritising journey charging.

As the number of EVs on the road ramps up, it will be essential to increase the number of charging heads to keep queuing times to a minimum. Installing more chargers or single chargers that can charge multiple vehicles at once will help to achieve this. This will also create critical mass enabling the development of complimentary services which will enhance the user experience.

An example of such a charger is ABB's recently released Terra 360 modular charger which can simultaneously charge up to four vehicles with dynamic power distribution. This means that drivers will not have to wait if somebody else is already charging ahead of them. They simply connect to another plug. The new charger has a maximum output of 360 kW based on a 90 kW modular configuration. This means the Terra 360 can charge the following vehicle configurations:

1 vehicle at 360 kW
2 vehicles at 180 kW
3 vehicles e.g one at 180 kW and two at 90 kW
4 vehicles at 90 kW

Additionally, utilising modular, scalable, upgradable EV charger technology provides Charge Point Operators the ability to increase the power of the outlets without the need to replace the EV charging unit. For example, ABB's Terra 180 can initially be configured as a 90 kW or 120 kW charger and then can be upgraded to 180 kW within the same form factor by adding additional power modules.

Furthermore, in order to create a robust & reliable network of journey chargers with a high availability, we strongly recommend the government to avoid a single source EV charger supplier strategy and encourage the government to employ a strategy that utilises EV chargers from at least 2 to 3 reputable suppliers. This approach will help to secure a certain level of system redundancy and is consistent with the approach applied in countries such as Norway and Netherlands. Specifically, it will help to mitigate the following risks:

1. **Systemic hardware and/or software faults related to a single supplier**
2. **Manufacturing or supply chain constraints related to a single supplier**
3. **Cyber security vulnerabilities related to a single supplier**

5. Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 18)

We agree with this approach and like the conceptual framework in Figure 7.

One of the key input factors to monitor is the development of the "kWh/distance travelled" of the next generation EVs from the major vehicle manufacturers as this is a lead indicator for EV charging infrastructure requirements.

6. Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 18)

ABB has ongoing collaboration with 3rd parties but is currently not able to share details.

26 November 2021

Consultation: Public EV charger roadmap
Evidence, Insights and Innovation
Energy Efficiency & Conservation Authority
PO Box 388
Wellington 6140

By email to publicevcharger.roadmapconsultation@eeca.govt.nz

SUBMISSION ON STATE OF CHARGE: CONSULTATION PAPER ON DEVELOPING A SHORT-TERM ROADMAP FOR THE PUBLIC ELECTRIC VEHICLE CHARGING NETWORK

ChargeNet NZ Limited (**"ChargeNet"**) is one of the leading public direct current (DC) networks in New Zealand. Our ultimate goal is to drive the transition to a more sustainable transport and mobility future through the uptake of electric vehicles.

We welcome the opportunity to comment on EECA's State of Charge: Consultation paper on developing a short-term roadmap for the public electric vehicle charging network (**"Consultation Paper"**). We are keen to work alongside EECA to encourage a rapid increase in the uptake and use of EVs in New Zealand.

About ChargeNet

ChargeNet was founded in 2015 to address the critical lack of public EV charging stations in New Zealand. The lack of charging stations was a severe barrier to transitioning from internal combustion engine vehicles to EVs. Since 2015, we have established a nationwide network of rapid charging stations. We now operate 275 rapid charging stations and we have over 25 new sites planned. Over 25,000 EV drivers use our services. ChargeNet's focus has been to ensure New Zealand has a robust charging network. To date, ChargeNet has been the largest contributor of private capital to New Zealand's public EV charging infrastructure. We have been supported on this journey by EECA. That contribution continues with current and planned significant investment over the next few years in the DC fast and high-powered charging network.

ChargeNet is looking forward to establishing a long-term collaborative relationship with the Government and EECA to secure New Zealand's decarbonised future.

ChargeNet's submission on the Consultation Paper

It is vital to continue to expand the public EV charging network ahead of growing demand. We agree with EECA that this will encourage greater EV uptake by consumers and help to achieve New Zealand's climate goals.

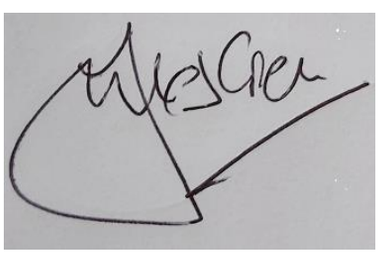
ChargeNet supports and would add to the objectives in the Consultation Paper. In particular:

- We agree public confidence in the charging network is important and encourages EV uptake. This is more nuanced than just building more charging stations to establish geographical spread across New Zealand. It also means upgrading and building capacity at existing charging stations, as well as meeting the urban area needs for more density in the DC network as EV take up accelerates. It is important that EECA supports all these outcomes to ensure equitable and uncongested access, so that a resilient network can be established that is able to meet growing demand.
- We support the need to ensure the charging network is distributed spatially. Appropriate coverage throughout all areas of New Zealand is fundamental to a well-functioning network. The need to ensure that those charging stations can be accessed safely and by all customers is also important. ChargeNet works hard to ensure equitable access (in all meanings of the word) to its charging network.
- The need for government investment and financial support in the charging network is clear. The Government also plays a critical role in removing barriers to entry and barriers to action in this industry and facilitating a joined-up approach to the policy and legislative changes required to roll out the best possible charging network.
- The roadmap will need to rely on the best available information and knowledge. ChargeNet is the charging network market leader and has an extensive data and knowledge base. We would be pleased to work with EECA and the Government to share what we know for the benefit of all New Zealanders.
- ChargeNet encourages new entrants and competition in the EV charging market. We would note a challenge to make this commercially viable for new entrants and existing participants to achieve this objective is the current practice of "free" fast charging by electricity networks, which we would suggest is restricting competition and preventing the growth of resilient networks in particular areas around New Zealand. This objective also requires joined-up thinking and taking a wide lens to not just the charging network but the electricity sector more broadly.

We build on these key points in our detailed submission on the Consultation Paper, which is **enclosed**.

Conclusion

We look forward to working alongside EECA in strengthening New Zealand's EV charging network.



James Cozens
Business Development Manager

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	James Cozens
Email address:	James.cozens@charge.net.nz
Phone number:	027 536 336
Organisation:	ChargeNet NZ Limited (ChargeNet) welcomes the opportunity to submit our comprehensive response to the EECA "State of Charge" public consultation. We commend EECA for embarking on this consultation and recognise the significant research already done. The establishment of a charging road map, even short term, is vital given the role EV infrastructure will play in New Zealand's future as we transition to a net carbon zero economy. ChargeNet, founded in 2015, is one of the leading public direct current (DC) networks in New Zealand. ChargeNet was established on the belief that electric vehicles (EVs) are the future of New Zealand's transport system. To date ChargeNet has until recently been funded by its founders. However, with considerable capital expenditure still required in what is a "long game" from an investment perspective, and the continuing lossmaking nature of the business, external capital was introduced into the business recently with Mercuria, a Swiss based investor, taking a 20% interest in the business. Since the inception of the Low Emission Vehicles Contestable Fund (LEVCF) (now Low Emission Vehicle Fund, LEVF), ChargeNet has worked closely with EECA and has been the biggest contributor to date of private capital to New Zealand's public EV charging infrastructure. That contribution continues with current and planned significant investment over the next few years in the High Powered charging network throughout New Zealand.

ChargeNet now manages 275 stations across the country with over 25 new sites planned currently. Over 25,000 EV drivers (growing daily) now use our services and since inception, recognising the importance of driver confidence, reliability and security, ChargeNet provides free support to EV drivers 24 hours a day, every day of the year.

In parallel with this private investment, ChargeNet has also built significant knowledge around building a public DC network including the complex nature of site selection, as well as ensuring that the network is running reliably for New Zealand consumers, including world class systems and procedures. As an example, we have an up time reliability of 99%. Such reliability is critical to giving confidence to motorists that they can make their journey in an EV throughout New Zealand.

Over the last seven years, ChargeNet has also worked in partnership with the Better NZ Trust to enable the EECA community outreach programme and raise awareness of EVs through events and sponsorship.

Our responses are provided as a commercial entity with significant in-depth knowledge and experience of providing public charging infrastructure in New Zealand. As a values-led social enterprise that promotes sustainability benefits (including environmental, social, economic and community), our replies should also be read knowing that the sustainable future of New Zealand forms an integral part of our motivation.

Despite our extensive investment into our network and growing demand for public EV charging services, as noted earlier, ChargeNet is not yet profitable but we continue to invest in providing public charging infrastructure ahead of demand.

It is vital to continue to provide public EV charging ahead of the growing demand to give confidence to motorists to make the switch from fossil fuelled vehicles to EVs and achieve New Zealand's climate change goals. To do this, ongoing Government support is needed such that there is a long-term business model for private sector participants that can not only install high quality infrastructure but also operate and maintain it with very high levels of reliability. Without this ongoing maintenance of a high quality network, the benefits of the significant private and public investment in developing this network could be negated by a poor consumer experience.

☐ The Privacy Act 1993 applies to submissions. Please tick the box if you do **not** wish your name or other personal information to be included in any information about submissions that EECA may publish.

☐ EECA may upload submissions and potentially a summary of submissions to the website, **www.eeca.govt.nz**. If you do **not** want your submission or a summary of your submission to be placed on this websites, please tick the box and type an explanation below:

I do not want my submission placed on EECA's website because... [insert reasoning here]

Please check if your submission contains confidential information

☐ I would like my submission (or identifiable parts of my submission) to be kept confidential, and **have stated** my reasons and ground under section 9 of the Official Information Act that I believe apply, for consideration by EECA.

Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   We agree with the overall scope. The definition and the outlined description of each section is true.

   There is an additional lens that should be applied in addressing the upgrading or adaptability of the old technology that sits within destination charging (which makes up the majority of the public network). It is still not commercially viable to upgrade existing charging locations to be future proofed or improve the redundancy of the existing public network and this is, and will be, the most heavily used area of the Public Network. Consideration of these challenges should be incorporated into the scope.

   For example, ChargeNet currently maintains a technologically advanced network of public charging stations at its own cost with assistance from EECA and more recently private investment. The scope should consider ways of supporting the upgrading of the existing DC public charging network.

2. Regarding EECA's objectives for the public charging network:

   Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

EECA consumer research has consistently shown that Internal Combustion Engine (ICE) vehicle drivers state that one of the main barriers to EV uptake is lack of visible charging infrastructure.

Other barriers include price differentials between EVs and ICE vehicles, real and perceived driving range of EVs and the variety of EV models offered in the New Zealand market. These are starting to be addressed through Government policies such as the Clean Car Discount and the Clean Car Standard, encouraging new models to enter the market at lower price points.

We would suggest the "availability of public electric vehicle charging infrastructure" should consider the available DC charger infrastructure (for both Journey and Destination), as well as:

(i) the congestion of that DC charger infrastructure i.e. in Europe for example we have observed in addition to building out further sites, there is a parallel trend to take existing sites and install additional charger infrastructure and/or upgrade existing infrastructure (again for both Journey and Destination); and

(ii) the need to provide for additional DC infrastructure and sites to build out network density, especially in populous areas in anticipation of EV uptake accelerating.

We believe within the consideration of Objective 1 these additional lens should be considered.

Charger availability and relieving public charger congestion are two areas where EECA support will assist with accelerating EV uptake, enabling existing network adaptation to improve redundancy and helping installation in new locations in line with the different modes of public charging needs, especially in the more densely populated areas of New Zealand.

If drivers expect to see a multi EV Charger Station Forecourt, for comparable "visibility" to the existing fuel station network, then investment will need be made into land areas where these can be built.

EECA also has an important role in educating ICE drivers what charging infrastructure looks like, where to find it and how to use it, to help overcome the barrier of "visibility". However, the more likely scenario is to support continuity of existing locations for public charging areas as described in both Destination and Journey Charging scenarios. This instills the perception of where EV chargers are expected to be for drivers.

Many existing sites (subject to capacity restraints) can facilitate more charging ports, but it would not yet be commercially viable to do this without government support.

Objective 2: Provide all users with safe and convenient access to charging infrastructure

It is not clear whether EECA is wanting to achieve minimum physical safety standards for EV stations or for network operators to have the functions in place to enable EECA to help all users have access to the chargers. This objective currently conflates different goals that should be separated from each other. We support objectives that separately seek:

- To improve user accessibility. We agree that EECA must support equitable distribution and charger installations in rural areas in order to achieve their overall goal. This is separate from the safety and accessibility of a site. In addition, to enable convenient access, we would suggest EECA needs to consider how we address congestion levels at existing sites and/or development of further DC network density in urban areas as EV update accelerate to ensure equitable and uncongested safe access to all.
- To ensure EV networks follow guidelines on safe access with minimum accessibility requirements as they do with current transport agencies etc (lighting, markings, signage, bollards etc). The cost of installing safety requirements should be captured in the site design criteria by the charger operator, and budgeted for, and will vary based on location, but the support for end users that require extra support with accessibility (access to the app, users with low income, open payment / discount solutions etc) is a separate objective.

Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

ChargeNet is fully in agreement with the desired objective of charging infrastructure standards, including such matters as interoperability. As one of the leading public charging network providers in New Zealand, we would be happy to work with EECA to help lead an industry wide initiative on the matters. Please contact us via the details provided below as we are keen to assist on this workstream.

Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

ChargeNet agrees specifically with the statement "We want to provide sustainable and scalable EV charging infrastructure, with sites being designed to remain viable as demand grows and having the capability to respond to changing demand beyond 2025" and we also recognise that EVs and EV charger technology are advancing fast.

We therefore need the ability to transition existing and future infrastructure assets to different types of charging.

This is a must if EECA wants to support the bulk of the public DC charging network to improve asset utilisation and improve accessibility for drivers where it is not currently commercially viable.

Currently, important parts of Government and the private sector are operating in silos. To reach this objective, key stakeholders need to be involved in joined-up thinking. For example:

- Government intervention with Electricity Distribution Companies to enable better planning for future sites for Higher Power charging locations would assist this process significantly and reduce installation time.
- Regulation for lines companies to disclose the sub-station and line capacity should be considered (as is done in the UK) and regulation which requires transformer upgrade costs to be contestable (as they are in other countries).

- Waka Kohati has a role to play in the provision of accessible land for charging sites on realistic terms. Currently, a Licence to Occupy with a 6 month notice period is the most that Waka Kohati can offer a network operator. Commercially the minimum requirement we would expect 5 years for a 50 kW charger and 10 years for a 300 kW charger.

  Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

EV infrastructure is a competitive market. As demonstrated by ChargeNet's history, there are opportunities for new entrants. However, it will be important to ensure competition can continue to thrive to ensure that charging is well maintained and providing confidence of and the highest quality of service to EV drivers. A high quality public charging service is paramount to accelerating the uptake of EVs to deliver climate change benefits.

A threat to competition in the EV infrastructure market is the ability of electricity network providers to leverage their power in that market. For example, the government should support and regulate a commercially level playing field for all end users in terms of electricity networks not being able to offer free public charging infrastructure, to enable better competition.

There are currently locations in New Zealand where some charging networks are reluctant to install and compete for fair coverage (including ChargeNet) because of existing “free” fast charging. In the short term free charging may be beneficial for consumers. However, it is unlikely these fast chargers will remain free over the medium to long term and over that time new market entrants have not been able to enter the market. This eliminates competition in those areas affected and has the effect of reducing the resilience of the network overall.

We understand that changes under the Electricity Industry Amendment Bill will provide the Electricity Authority with greater power and flexibility to regulate markets where cross-involvement or vertical integration can inhibit competition. The rules currently apply to electricity networks who have generation or retail operations on their networks, and it may be that specific rules need to be put in place govern their involvement in EV infrastructure, to ensuring a level playing field in that market.

With several years' experience ChargeNet would work alongside EECA on pilot schemes (as outlined) going through site approval and installation to help enable and streamline this process. However, this process could be fast tracked by reviewing the many completed projects to date and identifying issues in site selection, site design criteria, approvals and installation.

Objective 6: Enable innovation in new technology and business models

ChargeNet completely agrees with this objective to help providers develop innovative solutions for the greater good of customers both physically and remotely.

We would work proactively with EECA to achieve this exciting objective.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

We agree that government should be prioritising a High Power Charging network rollout with a targeted goal of meeting the modelled demand by the 5 year mark and beyond. The High Power charging network adds to the current extensive 50 kW network as Journey Charging infrastructure.

Whilst focusing on adaptability of the technology that the High Power charging network will offer, EECA should however NOT neglect the existing public charging network that will eventually transition from Journey Charging to Destination Charging and EECA must continue to prioritise those areas for existing site and charger upgrades too, as well as working with the private sector to address the public DC network density concerns previously mentioned.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

We feel that choosing one single option to define the basis of the "roadmap" would be a mistake as all 3 options should be used in conjunction and modelled within a region, based on:

- Existing EV population
- EV model density (CHADEMO vs CCS)
- Existing Infrastructure usage behaviour (fleets vs private)
- User charging patterns (home charging vs public charging etc time of day, congestion etc)

We would prioritise Journey Charging and Increase Number of Charging heads together as they are clearly linked.

We don't believe that a blanket rule of 75km max distance between chargers is a clear strategy to meet future demand. There are many other factors such as population density, population growth rates need be considered.

ChargeNet, with the proviso of not releasing commercially sensitive data, would be happy to work with EECA using 5 years of actual charging data incorporating length of sessions, kW used, time of day, unique users, location of charging sessions, customer journeys etc.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

Without fully understanding the full cost, resource, and time it would take EECA to develop a Digital Twins system, modelling is crucial to the EV network planning and fully dictates a network operator's strategy on the type of charger and the return on investment that is required for a new location.

We would fully support detailed modelling being used to drive decision-making. It also enables retrospective review in the future to look back and in improve future plans at that time. ChargeNet would welcome the opportunity to work with EECA to provide data to assist with the required modelling (with the proviso of not releasing commercially sensitive data).

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

Yes and we have the capability to do significantly more work as our systems have an extremely granular level of data. Again, ChargeNet would welcome the opportunity to work with EECA to provide data to assist this modelling (with the proviso of not releasing commercially sensitive data).

If you have any other comments you would like to include, please provide these below.

Through the significant private investment of capital, time and resources that ChargeNet has made in New Zealand's charging infrastructure, started before any government funding was accessible, we are now in a knowledge/experience based position with extensive capability to work with EECA in assisting current and future planning.

Whilst we have the constraint of wanting to protect our commercially sensitive data, we are still willing to share as much as we can to enable and facilitate an effective national strategy for "NZ Inc".

Providing very reliable public EV charging ahead of demand is essential to give confidence to motorists to make the switch from fossil fuelled vehicles to EVs and achieve the CO_2 emissions reductions necessary from transport to meet New Zealand's climate change goals. Government support is needed such that private sector charging providers can see a profitable long-term business model that delivers high quality infrastructure which meets EV drivers' expectations with high levels of reliability.

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	Ronald Smits & Stephanie Smits O'Callaghan
Email address:	steph@hikotron.com
Phone number:	027 606 7270
Organisation:	Hikotron Limited

☐ The Privacy Act 1993 applies to submissions. Please tick the box if you do **not** wish your name or other personal information to be included in any information about submissions that EECA may publish.

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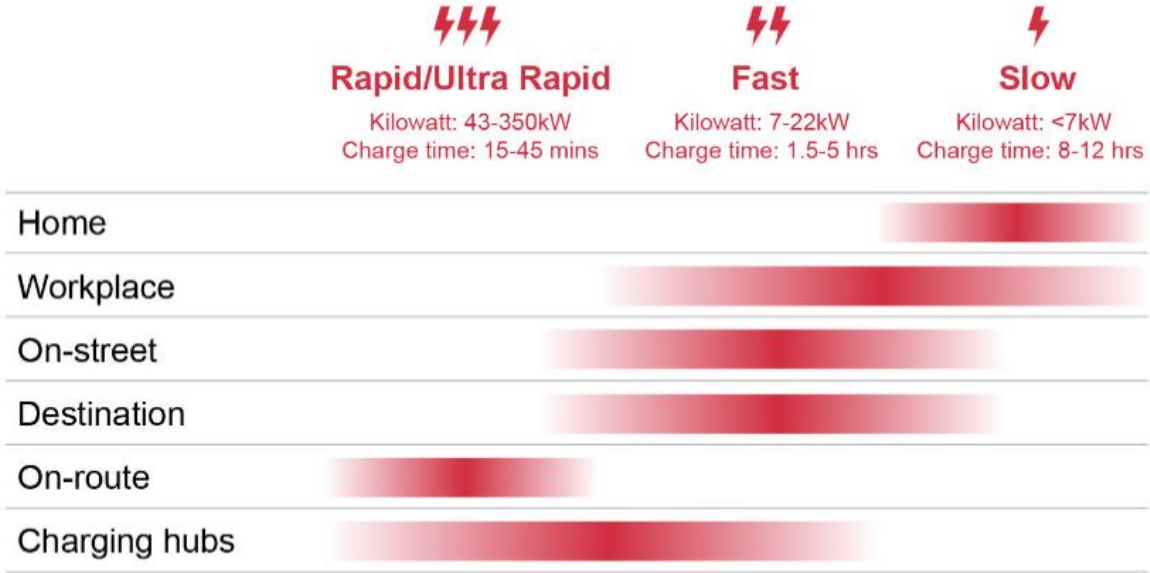
Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

Hikotron does not agree with how the different types of EV charging are described in section 3.1.

The types of EV charging and the naming conventions (i.e. Home, Workplace, On-street, Destination, On-route, Charging Hubs) should be as per the diagram below. This is taken from the *Electric Vehicle Charging Strategy for Wales* which is also mentioned as recommended reading; The ARUP Supporting research, Stakeholder Engagement Document (page 29).



The reasons for this are set out below:-

a) *Fast Public Destination Charging AC 7-22KW.*
   This needs to be plentiful, reliable, and convenient. It cannot rely solely on private business to provide such infrastructure as suggested in Section 3.1. EV drivers need consistent availability of EV chargers. They will not always be a 'customer' of the

business that owns the EV charger. Furthermore, chargers offered as a 'bonus' are not well maintained and are often 'out of service' especially if they are offered for free.

The Charging Behaviour Survey (October 2021) results demonstrate the top three priorities for EECA investment: #1 Location, #2 Quantity and #3 Access. The most efficient way to achieve this within the EV charging network is through plentiful, reliable, and convenient destination charging (AC 7-22kW). When we look to Europe where EV adoption is higher than New Zealand, approx. 90% of public charging infrastructure is AC (see extract from the 2020 European Federation for Transport and Environment AISBL).

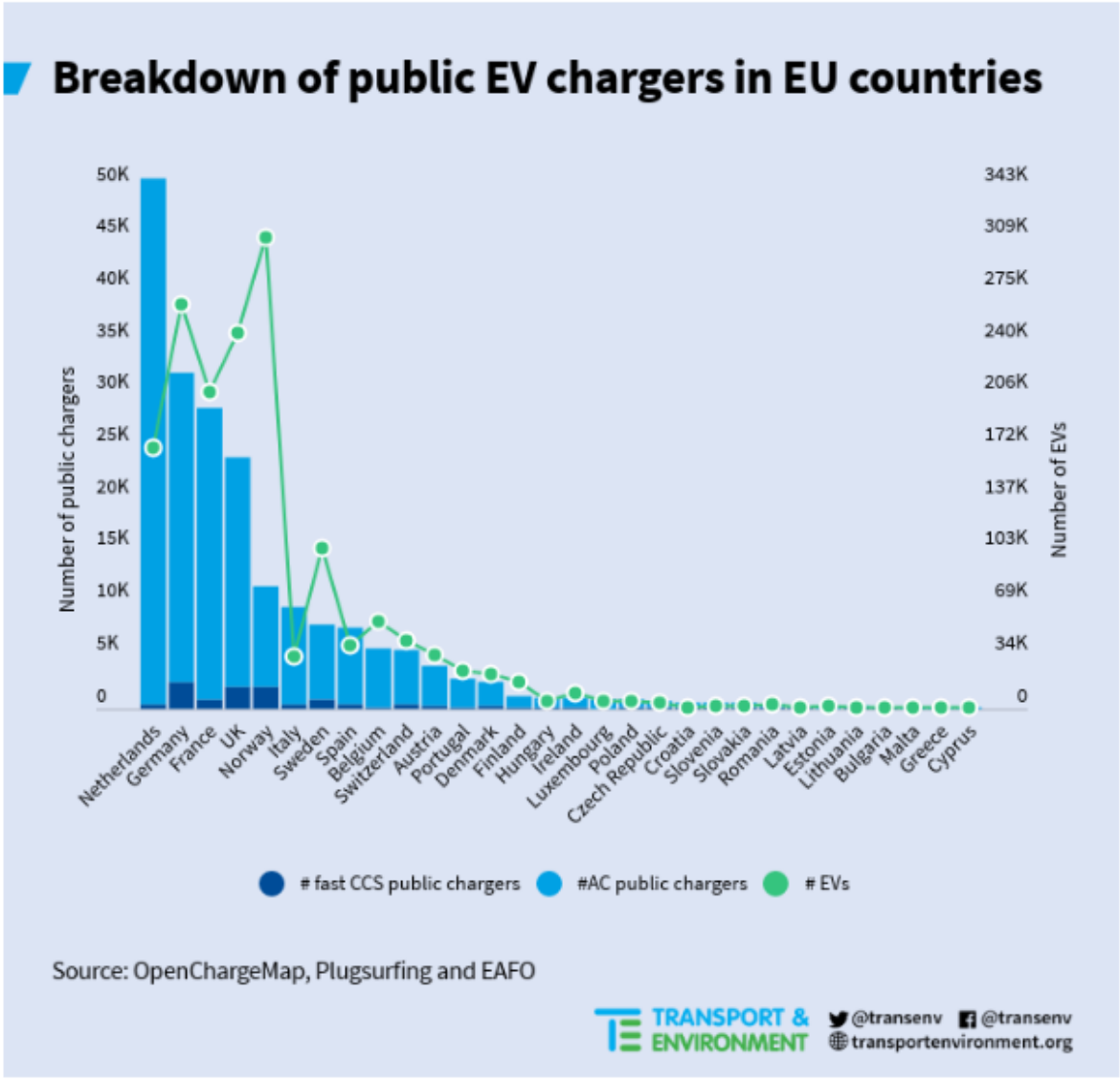


Figure A3: Current number of EVs and public charge points in the EU

New Zealand should also not rely on or encourage 'free charging' – businesses can offer this to customers, but this cannot be relied upon to be a national EV charging infrastructure. Free charging will likely also be unsustainable once EV uptake increases. Again, this was raised as an issue within Charging Behaviour Survey (October 2021) responses under 'Cost'. Free charging does not encourage efficient/good practice EV driving habits and is prone to misuse of the charging asset. The Charging Behaviour Survey (October 2021) also concluded that "Half of respondents would like chargers to be more expensive/not free, to combat 'freeloaders' and queues". This shows that even at 0.5% EV adoption the frustrations with badly managed infrastructure are already starting to appear and this will only worsen as EV adoption increases.

Providing more AC charging opportunities frees up DC Rapid/Ultra Rapid charging for those who really need it i.e. long distance travel and short range EVs.

b) *On-Route Rapid/Ultra Rapid charging (150kW+)*
This needs to be reserved for on-route travel through smart DC charging hubs only. DC charging should be 150kW+ and on smart load sharing systems to make full use of the on-site transformers (Hikotron can provide further advice on smart DC charging hub options). 25-50kW chargers are now becoming obsolete and it does not suit places like supermarkets, gyms or cinemas. Customers at such locations are rarely far from their home or work and tend to be at the location for over 2 hours and it would be inconvenient to have to return to the vehicle mid-way through their activity. For the equivalent cost and power consumption of a single DC charger, more AC chargers can be provided. This increases not only the availability to the EV drivers, but also the convenience, as vehicles do not have to be moved in and out of a single charging station, as more chargers are available. It is critical that the correct charging infrastructure is installed for each location.

Hikotron disagrees with part 3.2 – The roadmap should not only focus on fast charging. In The Charging Behaviour Survey (October 2021) response, 'Power' was listed as the 4th most important investment priority coming behind Location, Quantity and Access. Therefore, the power/charging speed of the charging infrastructure does not seem as important as having more chargers available in a wider number of locations i.e. car parks, institutions, beaches, walks, places of interest, on-street and town centres. Vehicles are parked for 90% of their existence, this is the time they should be charging. If EV drivers are able to charge at their destination, they no longer have to stop unnecessarily to charge on the way.

95% of public fast destination charging should be AC. AC charging promotes the most efficient and convenient way to charge, as the secondary activity i.e. while the vehicle is parked. AC charging can also easily offer load sharing capabilities maximising the use of on site infrastructure. DC chargers are also susceptible to software bugs and hacking as they communicate directly with the EV's onboard battery system and therefore require more complex software. Therefore, they require more oversight and maintenance and this means they are more prone to being 'out-of-service', a problem that is already experienced frequently here in New Zealand.

Hikotron agrees with section 3.3 and the focus on light EV's.

Hikotron disagrees with the short-term focus set out in section 3.4. Infrastructure needs to be well thought out and plan ahead for the long term. New Zealand should look to other successful systems implemented in Europe and follow suit. There is no need to create a 'New Zealand solution' for EV charging.

2. Regarding EECA's objectives for the public charging network:

Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

Objective 2: Provide all users with safe and convenient access to charging infrastructure

Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

Objective 6: Enable innovation in new technology and business models

Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

Hikotron agrees with the objectives 1 to 6 set out above, but would add the following advice on how these objections are best achieved.

Objective 1 – charger speeds need to be appropriate for the location. Section 3.1 of the consultation document does not set this out correctly. Charging speeds and naming conventions should be aligned with what is set out in the *Electric Vehicle Charging Strategy for Wales* as detailed above.

Objective 2 – this is best achieved through AC – AC can be more plentiful and is safer and does not rely on unreliable software updates. DC should be allocated to major transport nodes with oversight of a forecourt.

Objective 3 – agree no further comment

Objective 4 – EECA need to ensure good EV driving habits are established early on, i.e. not incentivising the installation of free chargers or DC chargers in inappropriate places

Objective 5 – agree no further comments

Objective 6 - agree no further comments

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

Hikotron does think government should prioritise its public charging investment in high power ultra-fast chargers, but only for on-route charging hubs that use smart load sharing systems. This is due to the "bang for buck" in infrastructure spend. There should always be a trade-off between designing for peak loads (which often comes at a very high cost) versus load sharing what is "practically and reasonably available". See example from the ARUP Supporting research Stakeholder engagement Document (page 26)

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

Hikotron believes that there is a risk in trying to achieve these goals with the wrong solutions.

The focus should not be on reducing distance between chargers. It should instead be focused on key concentrated transport nodes for on-route Rapid charging hubs 150kW+.

Increasing the availability of charging heads and reducing the pressure on DC chargers should be achieved by offering plentiful AC chargers.

On-route journey charging needs to be supported by a well-established reliable and convenient AC infrastructure both are important and one should not be prioritised over the other and they should be supported together as one ecosystem.

There are also still barriers to implementing public AC charging such as land availability, planning consents, regulatory barriers, lack of policy guidance for local Councils and legal liabilities on road corridors.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

No – there is already a lot of data from other Countries with higher EV adoption rates, New Zealand should not re-invent the wheel.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

Hikotron have proposed numerous EV charger locations and have vast experience from using infrastructure in Europe where EV adoption is much higher than in NZ. Hikotron also have relationships with charge point operators such as Tesla and PodPoint UK. Hikotron is happy to provide advice or consult on any of these matters.

If you have any other comments you would like to include, please provide these below.

Hikotron is happy to participate in workshops/discussions on EV charging infrastructure in New Zealand.

Many thanks.

ZENOBĒ

Zenobe New Zealand Limited
ANDERSON LLOYD, Level 3,
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Submission from Zenobe New Zealand Limited to Energy Efficiency and Conservation Authority (EECA)

State of charge: Consultation paper on developing a short-term roadmap for the public electric vehicle charging network

19 November 2021

Introduction

Thank you for the opportunity to submit on this consultation paper. Zenobe's submission draws on our experience as one of the largest owners and operators of energy storage in the UK with 73MW currently in operation and another 100MW going live in 2022.

As well as energy storage, Zenobe has designed, built and managed the electrification of over 20 bus depots in the UK, Australia (including the largest electric bus depot in the country) and soon to be New Zealand. Zenobe also finances the batteries that power the buses as part of managed service. When the batteries on the buses are no longer able to complete the required routes, we repurpose them for portable/stationary electricity storage applications. This includes using repurposed batteries for supporting public fast EV charging for light vehicles.

Zenobe has had substantial investment since 2017, with the latest coming from Infracapital which has invested £150 million.

Fast charging challenges at specific locations

The consultation document confirms that New Zealand's public EV charging network now has at least one fast direct current (DC) charging station at least every 75 kilometres across over 96 percent of the country's State highway network. EECA is to be commended on its initiatives in facilitating and co-funding much of this EV charging roll-out.

Growth in the number of charging locations and total fast charger numbers must continue to stay ahead of electric vehicle growth and public EV charging demand to help achieve climate change goals. However, there are challenges to this roll-out to meet future EV charging demand in specific circumstances which will add extra cost to the network with current technology approaches. These circumstances include:

- Locations on the State Highway network where the costs of the required grid supply upgrade to deliver fast EV charging would be extremely high and not justified by the traffic volumes, such as the Lewis Pass (SH7) and Haast (SH6).
- Locations which see high seasonal peaks in traffic volumes and consequently have short-term high demand for EV charging, but low traffic volumes and low demand for EV charging at other times of the year, such as holiday destinations in the Coromandel.
- High demand for EV charging associated with travellers to special events such as Mystery Creek Fieldays and Rhythm and Vines

New technology solutions for specific fast charging challenges

The costs of meeting the above specific types of EV charging demand challenges can be reduced by:

- the inclusion of stationary battery storage with EV charging, where the batteries are trickle charged from the grid avoiding expensive grid upgrades and potentially supplemented by solar PV
- the use of transportable, skid mounted battery storage combined with EV charging which can be located to meet seasonal EV charging demand peaks and service special events, locating this infrastructure where there is an existing grid supply to trickle charge from and potentially supplemented by solar PV
- using repurposed bus or other vehicle batteries for both permanent and temporary battery storage sites described above.

Zenobe can supply and operate this type of repurposed battery storage and skid mounted charging infrastructure as a service for Charge Point Operators (CPOs) and others, such as event organisers.
We have provided skid mounted battery storage using repurposed bus batteries to provide power for international off-road electric SUV racing series Extreme E in locations as diverse as Greenland and Saudi Arabia.

Zenobe has made an application to the Low Emission Transport Fund Round 1 to demonstrate for the first time in New Zealand skid mounted battery storage combined with EV charging, which uses repurposed batteries which are trickle charged from the grid.

Zenobe's solution can be less expensive than network upgrades and battery storage provides greater utilisation of network assets by increasing use during off-peak periods overnight. These cost savings and higher asset utilisation for network operators will result in lower overall network costs benefiting all customers on the network.

Response to EECA's consultation questions

1. ***Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)' Do you agree with the scope described above? Can you suggest any changes? (Page 8)***

The types of vehicles which use public EV fast charging infrastructure can include vehicles above the 3.5 tonne definition of a "light vehicle". This includes campervans, minibuses, larger delivery vans and light urban trucks. Their charging needs are similar to light vehicles and can be charged from the same fast charging infrastructure. The only requirement is for a larger charging space to be included, particularly at charging locations which can charge multiple vehicles. These vehicles typically cover a much higher mileage than passenger cars. Providing for their electrification needs therefore delivers greater CO_2 emission savings per vehicle.

2. ***Regarding EECA's objectives for the public charging network:***

   a. Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure
   b. Objective 2: Provide all users with safe and convenient access to charging infrastructure
   c. Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met
   d. Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment
   e. Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers
   f. Objective 6: Enable innovation in new technology and business models

Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 10)

Zenobe agrees with objectives 1 to 6. We also think that a 7th objective should be added: to minimise the overall costs of a nationwide network of public fast charging infrastructure by working with Transpower and electricity network operators to improve grid connection information available to CPOs, while deploying cost-effective new technologies such as stationary battery storage where appropriate.

See below for links to different examples of detailed network capacity maps available in the UK:

https://www.westernpower.co.uk/our-network/network-capacity-map-application

https://www.spenergynetworks.co.uk/pages/sp_distribution_heat_maps.aspx

https://www.nienetworks.co.uk/connections/capacity-map

Zenobe understands that such maps are not publicly available in New Zealand. New regulation may be required to facilitate access to such information and ensure that public EV charging infrastructure can be installed cost-effectively for public benefit.

3. ***Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 16)***

A variety of different types of public fast charging will continue to be needed to match different locations and driving purposes. When making decisions about what types of chargers to prioritise, government should consider:

- traffic flows
- residential densities and ability to charge at home
- costs of grid upgrades and alternatives/supplements such as battery storage
- seasonal EV charging demand peaks
- equity issues
- rise of car-share, on demand ride hailing and other vehicle technologies which reduce overall light vehicle demand while increasing vehicle utilisation through shared vehicles with very high vehicle kilometres travelled (VKT)
- urban freight and last mile deliveries
- continuing improvements in EV battery density and cost reductions
- the costs and benefits of ensuring full charging network coverage around the country.

Ultra-fast chargers often require grid reinforcement, which can be expensive. In return for the higher charging speed, drivers pay a higher rate per kWh. Due to the speed of charging, chargers can service multiple vehicles per day, which improves revenues. Conversely, while slower chargers cost less to install, they generate lower daily revenues as they can only charge 2-3 vehicles per day.

We therefore think that the deployment of ultra-fast chargers should be prioritised according to context. One approach might be to prioritise journey charging, deploying ultra-fast chargers at key locations along state highways used for long-distance inter-city travel. Where the cost of upgrading the public grid prohibits the deployment of ultra-fast chargers at these locations, batteries could be used to supplement network capacity. 50KW public fast chargers may be more suitable for more residential areas.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 16)**

An alternative option would be to ensure that each community over a certain population size has at least one public fast EV charger, supplementing domestic or workplace charging. Demand for public fast charging is highest where people live, and travellers will also have access to services such as eateries, shopping and recreation) when charging in these communities. Community fast EV chargers would reduce range anxiety by ensuring that local EV users would have the possibility to quickly charge their vehicles nearby should they forget to charge at home or need to make unexpected journeys.

The approach would also make EV charging more visible in the community. Greater confidence and visibility of fast EV charging will help encourage greater adoption of EVs. The use of stationary battery storage can help provide EV charging in communities where there may be grid constraints. It is likely that this approach can deliver an outcome similar to ensuring chargers are located at closer distances than every 75 km. Any remaining gaps after this approach can be addressed separately and some may also benefit from having stationary battery storage to reduce the costs of connection.

5. **Do you agree with the proposed approach for developing a data-driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 18)**

The available electricity network capacity and associated costs to upgrade needs to be taken into consideration for the public EV charging roadmap. This includes the potential to use stationary battery storage as well as relocatable charging with battery storage to meet seasonal or temporary EV charging demand peaks.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 18)**

As a company that currently manages over 250 electric vehicles worldwide, we have substantial data on EV performance from numerous bus and light commercial vehicle fleet operators. This data enables us to model and predict the performance of electric vehicles under different situations. Our modelling takes into account site power availability, which enables us to factor the need for grid upgrades and / or stationary batteries into our customers' plans. We do not have experience of modelling public charging in New Zealand but are keen to support EECA with charging and EV performance analyses.

Submitter information

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Please check if your submission contains confidential information

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3 Motor vehicle industry representatives

FUSO NZ

Motor Industry Association

Motor Trade Association

Fuso New Zealand submission to the Energy Efficiency and Conservation Authority

State of Charge: Consultation paper on developing a short-term roadmap for the public electric vehicle charging network

November 2021

Introduction

Thank you for the opportunity to submit on the consultation paper on developing a short-term roadmap for the public electric vehicle charging network.

Fuso New Zealand is the second largest seller of trucks in New Zealand and the leading seller of 4.5-9 tonne trucks with advanced safety features.

This year, Fuso has introduced the eCanter 100% electric truck to New Zealand, with 21 eCanters either already operating on New Zealand roads or in build to be operating in the next 3 months at the time of this submission principally for last mile urban freight delivery.

Fuso is very appreciative of the co-funding support EECA has provided towards electric truck demonstration projects to date with our customers.

eCanter trucks

The eCanter comes in two variants:

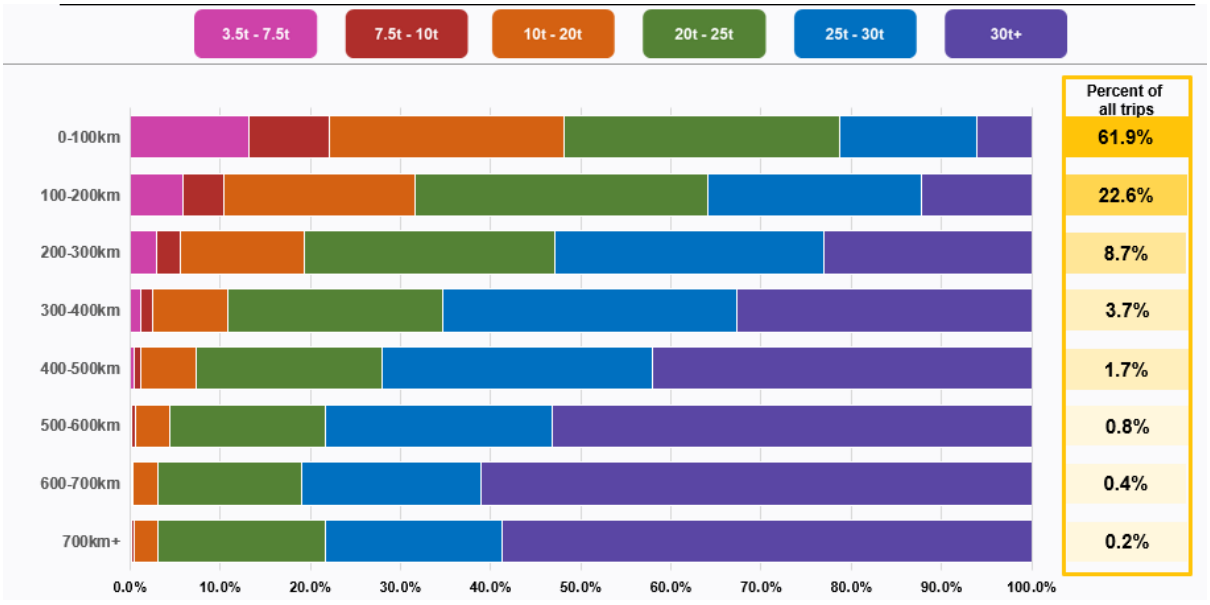
- GVW: 7,500 kg.
- GVW: 6,000 kg which can be driven with a car licence.

Both variants have an 82.8 kWh battery pack, giving a driving range of 100-150 km. While most eCanters will be AC charged at depots overnight, eCanters can also be DC fast charged via the CCS-2 charging port, with charging to 80% from 10% at a 50 kW DC charger, taking around 45 minutes. Alternatively, if a Driver needs a top up for any reason such as diversions or miscalculation the eCanter can be given a quick burst on a faster charger to get her home, do an emergency pick up or drop off or get themselves back to base.

60% of all truck trips are under 100 km

Analysis of EROAD data by NERA for Ara Ake shows that more than 60% of all truck trips are under 100 km, at nearly 85% are under 200 km.

Figure 1: Freight vehicle trips by distance, for different vehicle weight bands

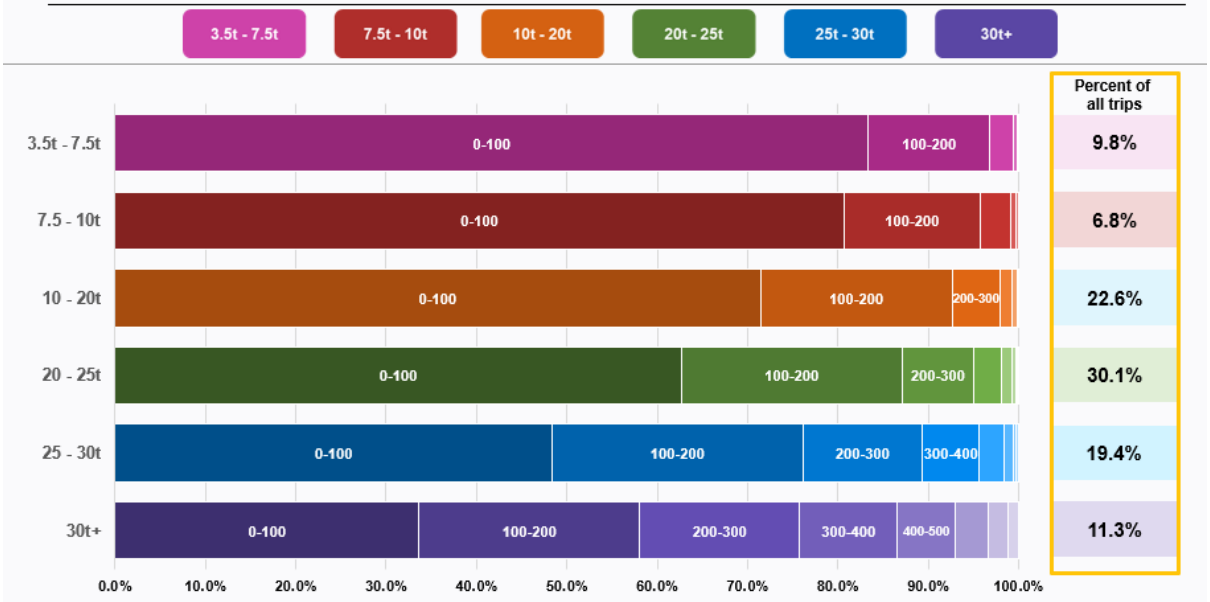


https://www.araake.co.nz/projecgs/projects/ldhf-phase-two/

Figure 1 shows that most freight is delivered relatively locally, usually within urban areas, just as most light vehicle trips are local journeys and within urban areas.

Small trucks 7.5 tonnes and under (the size of the eCanter) account for nearly 10% of all freight vehicle trips with the majority of these trips being under 100 km, as shown in Figure 2 (same data source).

Figure 2: Freight vehicle trips by truck weight band, for different trip distances



Early experience of eCanter use and public DC charging

As part of the Auckland Zero Emission Area project, several freight operators with eCanters have expressed interested in being able to use public DC charging in the Auckland area.

While the operators charge the eCanter trucks overnight at their depots, there are occasions where they may want to undertake deliveries slightly beyond their normal operating area and public DC charging would enable this as the trucks have relatively limited driving range (100-150 km).

Truck operators considering electric trucks are seeking confidence from public charging, given that driving range is not something that they have to think about with diesel trucks and the ability to fill with diesel away from base is normal. They need confidence that should they run low on charge during a day's operation, that there is a public location where they can top-up fast charge before returning to their depot. Some DC chargers already in operation have sufficient parking space to allow a small electric truck to charge, even though the truck might not be able to park between the lines designating the charging bay.

The behaviour of small electric truck operators is very similar to that of light vehicle drivers, and a partial top-up charge in 20 minutes will often be sufficient to get the electric truck back to base. The ability to public charge small electric trucks helps normalise their operation, facilitating early uptake.

Parking bay size for DC fast charging

Some DC fast charging locations can already have sufficient space to allow a small electric truck to charge, even if this is not officially marked out.

The Lines Company, with co-funding from EECA, has installed DC fast charging in Ohakune with one larger parking bay to allow disabled drivers to charge. Figure 3 provides a photo of the site. This size of bay would allow electric trucks such as the eCanter to charge.

Figure 3: Fast DC charger installed by The Lines Company in Ohakune

One larger parking bay at a charging location will also allow easier charging for electric courier vans, minibuses, campervans, families with children, EV cars towing trailers, as well as small electric trucks. Drivers of courier vans often need to rearrange the parcels in their vans to make deliveries more efficient, and this can be done while charging electric vans if there is sufficient space beside their vans to do this. Families and others taking care of small children in car seats and strollers often need additional space around the car to make it easier, and many supermarkets provide larger parking spaces for these users.

Consideration should be given in the short-term charging roadmap to encourage some public fast charging locations to include one larger parking bay to allow disabled drivers, minibuses, campervans, courier vans and small electric trucks to also charge. This could be done, for example, by recognising the provision of a larger charging bay in any competitive funding process.

EECA could also specifically look at encouraging such DC fast charging in locations likely to be useful for electric courier and small urban electric truck operators as well as the general public, such as in the CBD, near Auckland Airport and urban centres in West Auckland and the North Shore.

Where a larger bay is provided it would not need to be restricted to use by certain vehicle types or drivers, just facilitate easier access to charging for such vehicles and disabled drivers through its existence. Commercial drivers in particular will want to quickly move on as soon as they have sufficient charge to complete their journey, freeing the space for other users.

It is important that all DC fast chargers require payment by users, and payment structures which discourage unnecessary dwelling at chargers should be encouraged.

It would be desirable if charging locations with a larger bay could be readily identified through charging apps and in NZTA's EV Roam database.

Public benefits of charging for light electric trucks now

Commercial vehicles including smaller urban trucks and courier vans are high mileage vehicles that typically operate today using diesel fuel. Providing DC fast charging infrastructure gives greater confidence to commercial vehicle operators to electrify their fleets, and consequently earlier adoption of electric trucks and earlier CO_2 emissions reductions.

The CO_2 emissions reductions from each commercial vehicle that is electrified will be significantly greater than for the average private car that is electrified due to the high mileage and high fuel consumption. Encouraging switching from diesel fuelled commercial vehicles to electric commercial vehicles also delivers significant air quality benefits in urban areas as diesel vehicles have a much greater impact on urban air quality than petrol vehicles.

Global MOU on ZE-MHDVs

New Zealand is one of only 15 countries to sign the Global Memorandum of Understanding (MOU) for Zero-Emission Medium and Heavy Duty Vehicles (ZE-MHDVs) at the recent COP26 meeting in Glasgow. ZE-MHDVs are defined as trucks and buses over 3.5 metric tonnes.
https://globaldrivetozero.org/mou/

In signing the MOU, New Zealand has committed to working with the other signatories to enable 100% zero-emission new truck and bus sales by 2040 with an interim goal of 30% zero-emission vehicle sales by 2030, to facilitate achievement of net-zero carbon emissions by 2050.

This is an aggressively positive and achievable target provided that fast policy action is taken by New Zealand to facilitate the uptake of ZE-MHDVs. Freight trucks between 3.5 and 10 tonnes, such as the eCanter, are entering the market here now and their uptake can be accelerated to help meet New Zealand's commitment in the MOU. One way to do this is to incorporate consideration of small electric freight trucks in EECA's roadmap for public EV charging. A separate road map for charging heavier freight vehicles will need to be considered soon.

Response to consultation questions

We wish to provide specific comment on questions 1 and 3 in EECA's consultation document.

Question 1 - Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'
Do you agree with the scope described above? Can you suggest any changes?

Fuso New Zealand thinks that EECA should expand the scope for provision of fast public light EV charging infrastructure in the short-term to also include 3.5-10 tonne electric trucks and larger electric vans. This is because:

- their charging requirements and routes are similar to light vehicles
- the size of these vehicles could be accommodated at many sites for light EV fast charging at relatively minimal additional cost

- these vehicles are entering the market now and not having public fast charging available to provide confidence and utility will slow their uptake
- one larger charging bay at a DC fast charging site will also provide utility for light vehicle owners including disabled drivers, van and campervan drivers and EV drivers with trailers.

Question 3 - Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers?

A variety of different public chargers will be needed to match the variety of different EVs and different driving patterns. Priority should be given to public chargers which deliver utility for high mileage, high fuel consumption vehicles, as these reduce the most CO_2. This includes chargers aimed at today's urban electric trucks such as the eCanter.

We would welcome an opportunity to meet with you

Fuso NZ would welcome an opportunity to provide further information or discuss our submission with EECA.

Kurtis Andrews

Managing Director
Fuso New Zealand

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

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Phone number:	021434097
Organisation:	Motor Industry Association

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Please check if your submission contains confidential information

☐ I would like my submission (or identifiable parts of my submission) to be kept confidential, and **have stated** my reasons and ground under section 9 of the Official Information Act that I believe apply, for consideration by EECA.

Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   We support the scope as written but we dio think there will be a need to consider the demand from heavy EVs in the near future.

2. Regarding EECA's objectives for the public charging network:

   Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

   The MIA supports these objectives.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

   While it is appropriate to focus on high power ultra-fast chargers for journey planning, there is also a need to provide slower DC chargers to accommodate the existing EV fleet that may do some intra-regional travel. The MIA believes the public charging network needs to accomodate, slow, medium and fast charging.

It is also important that this investment is future-proofed to ensure that the charger infrastructure/grid can cope with fast-charging new battery technology like solid-state batteries.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

The MIA supports both reducing the distance between chargers as well as increasing the number of charging heads at existing locations. The latter is very important in order to provide confidence to consumers considering EVs, in order to address concerns that they may need to queue for some time. In essence, the number of charging heads needs to exceed the likely demand.

In addition to priortising journey planning, there is also a role for fast charging at destinations, so that EV owners can fully recharge a long-range EV after arriving at a destination in order to undertake further travel the following day.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

The MIA supports developing a data-driven approach for the EV charger roadmap.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

n/c

If you have any other comments you would like to include, please provide these below.

n/c

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Phone: 04 385 8859

SUBMISSION

26 November 2021

Consultation: Public EV charger roadmap
Evidence, Insights and Innovation
Energy Efficiency and Conservation Authority
PO Box 388, Wellington 6140
New Zealand

By email: publicevcharger.roadmapconsultation@eeca.govt.nz

MTA feedback on public EV charging development

Introduction

The Motor Trade Association (Inc) (MTA) was founded in 1917 and continues to celebrate over 100 years of trust with the NZ motoring community. MTA currently represents more than 3,800 businesses within the New Zealand automotive industry and its allied services. Members of our Association include automotive repairers (both heavy and light vehicle), collision repair, service stations, vehicle importers and distributors and vehicle sales. The automotive industry employs 60,000 New Zealanders and contributes around $3.5 billion to the New Zealand economy.

The contact person in respect of this submission is:

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Title: Sector Manager-Energy & Environment
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Submission

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'. Do you agree with the scope described above? Can you suggest any changes?

MTA agrees that the provision of fast public light EV charging infrastructure should be focussed on the short-term (next five years). In the various Government consultations that have occurred over the past two years or so, MTA has consistently encouraged initiatives that help bolster consumer demand for electric vehicles. Consumer confidence in the availability and convenience of EV charging is critical to shoring up consumer demand.

We have focussed on the benefits of the existing service station site network not simply because MTA members control nearly 950 retail fuel sites. Rather, we see that this retail network has served the New Zealand travelling public for decades and we can see these businesses continuing to deliver fuel in the form of electrons rather than hydrocarbons.

Site placement:

The traditional service station network has been developed over many years and they are generally located in areas to take advantage of traffic volumes and service local communities with a range of convenience goods as well as fuel.

The service station sector is well placed to provide an extensive and accessible EV charging network that is both familiar to motorists (literally "*on the beaten track*") and can offer a range of services, safe and clean facilities for EV drivers while they charge their vehicle.

Payment options and convenience

The current service station sector has a range of payment options using self-service and full-service outdoor payment terminals and will have staff available to assist EV drivers should they need help using the EV charger. These factors would go a long way to reducing range anxiety and would encourage the uptake of EVs at a faster rate.

Most current EV owners will have at some point owned and driven an internal combustion vehicle and as such, will have frequented a traditional service station so will be familiar with their locations and services.

The current distribution of service stations would support greater use of on route journey charging by reducing any range anxiety.

The existing service station network will still be required through the transition period while we move toward a zero-emission fleet[1]. Having the ability to scale up the provision of EV charging in parallel with reducing liquid fuel volumes will encourage the service station sector to invest in additional EV charging capacity.

2. Regarding EECA's objectives for the public charging network:

a. *Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure*
b. *Objective 2: Provide all users with safe and convenient access to charging infrastructure*
c. *Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met*
d. *Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment*
e. *Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers*
f. *Objective 6: Enable innovation in new technology and business models*

[1] Even the most generous of scenarios envisage a fleet comprising more than 50% ICE vehicles in 2035-2040.

Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives.

MTA supports the six objectives listed.

3. Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers?

MTA agrees in part that the government should prioritise its public charging investment in high power ultra-fast chargers. While there are EV models currently available that can use these types of ultra-fast chargers, the bulk of EVs wouldn't. Caution is needed to locate ultra-fast chargers where grid capacity is compatible and where vehicles capable of using these chargers are located.

It is our opinion that in the short to medium term that fast chargers will be used to top up charge (i.e. 50% to 75%) while on route rather than full charge (i.e. 5% to 100%).

As EV ownership and 'normal use' grows, further analysis of charging behaviour will be needed to further optimise the charging network required.

4. Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option?

There are mainly benefits for reducing distance between chargers and prioritising journey charging as both these factors contribute to reducing range anxiety. For the most part, we believe that EV owners will charge their vehicles at home overnight. However, when out-and-about, it is best for them to have the certainty and convenience of liberally distributed fast-chargers.

MTA supports government funding to achieve these goals and suggest that a dedicated fund be set up to encourage service station operators to apply for subsidies to install EV chargers. Creating specific eligibility criteria that supports prioritising journey charging networks might be something worth considering. A similar funding scheme was run by Police in support of reducing incidents of aggravated robberies at service stations through subsidized cost of installing fog emitting devices; this project was well received by the sector.

With the present low ownership levels and incremental growth of the EV fleet, the return on investment in EV chargers just doesn't stack up as a profitable business case. However, having an EV charger at a traditional service station does help the business owner improve their rate of return by focussing on recovering investment costs through the delivery of complimentary goods and services to the EV driver while their vehicle charges.

Looking at the profile of the current EV fleet with a significant number of used import Gen 1 and Gen 2 Nissan Leafs, the battery range capacities of these older vehicles might only be 100 km or less. Having EV chargers at 75 km spacing would almost certainly be a risk to these EV owners.

As the EV fleet grows, the rate of return on investment experienced by the service station operator would encourage further investment in additional EV charging to keep pace with demand.

Increasing the number of charging heads as well as providing for multiple vehicle configuration (car plus trailer etc) is something that needs to be factored in the EV chargers at service stations.

5. Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements?

The use of this sort of technology could be a useful modelling tool but needs to be supplemented by real world consumer behaviour data.

6. Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs?

We understood that EECA would have this sort of data from the analysis of EV chargers funded through the LEVCF. We assume that EECA has followed up with recipients of grants to ensure the funds were properly spent and to gather data on how those funds have contributed to the uptake of EVs and EV charging.

It might be worthwhile engaging with organisations like Kalibrate who have been involved with data analysis and research into EV charging networks.

Thank you for the opportunity to provide comment on the public EV charger roadmap.

Yours sincerely,

Greig Epps
Advocacy & Strategy Manager

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4 Electricity retailers and distributors

Mercury NZ Limited

Meridian

Vector Limited

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	Buddhika Rajapakse
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Organisation:	Mercury NZ Limited

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Please check if your submission contains confidential information

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   We believe that the scope of the analysis proposed could be expanded to cover (typically slower) destination charging and (typically faster) journey charging. Phase 1 could potentially cover journey charging as a priority and Phase 2 could then look to include destination charging as well.

   We believe that both forms of public charging can contribute to alleviating range anxiety and wish to better understand how both can complement each other depending on journey type and as EV battery ranges expand, especially since the costs of providing destination charging are typically much lower than fast journey charging.

   This will in turn help both the public sector and the private sector to optimise "NZ Inc's" investment in charging assets and upstream network infrastructure.

2. Regarding EECA's objectives for the public charging network:

   Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

   Yes we agree with these objectives.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

We acknowledge that delivering ultra-fast chargers faces high economic barriers and so considering government support for this has merit. However, as outlined in our response to question 1, the quantum of public charging investment required for ultra-fast chargers needs to be better understood in the context of all forms of public (and indeed private) charging so that the investment into ultra-fast charging is efficient.

We also submit that whilst public destination charging is likely to be more commercially viable, barriers (both real and perceived in terms of information, electrical/network connections, funding, commercial viability, etc.) to efficient provision may exist and these should not be neglected.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

The risk we see is that the basic spatial approach mainly considers how fast chargers should be laid out, with limited visibility over how these will interact with other forms of charging.

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

Yes, but as per our earlier comments we believe this digital twinning approach provides an excellent opportunity to model journeys of different types to understand how private charging, destination charging and journey charging could complement each other.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

No.

If you have any other comments you would like to include, please provide these below.

No.

22 November 2021

Consultation: Public EV charger roadmap
Evidence, Insights and Innovation
Energy Efficiency and Conservation Authority

By email: publicevcharger.roadmapconsultation@eeca.govt.nz

Developing a short-term roadmap for the public electric vehicle charging network

Thank you for the opportunity to provide feedback on this proposed roadmap. Meridian is encouraged to see EECA's continued support for electric vehicle charging infrastructure. Investment in our nationwide electric vehicle charging infrastructure is critical now to ensure we can achieve our low emission transportation goals and support the growing needs of New Zealanders who are choosing electric vehicles.

Meridian is supportive of the roadmap development and the ongoing evolution of the Low Emissions Vehicle Contestable fund as New Zealand's electric vehicle charging landscape develops. While this roadmap is focused on the short-term (about five years) we see the need for continual review of the Government's role to provide certainty to the private sector and ensure that this emerging market develops in such a way that it may eventually be self-sustaining and no longer rely on EECA funding to deliver benefits to all consumers.

On the whole Meridian is supportive of the approach but sees the following opportunities for further refinement prior to implementation of any roadmap:

- improved access to data and clarity regarding the government's data provision role;
- greater transparency regarding the success criteria for applicants; and
- understanding how the roadmap will encourage new entrants and competition for the provision of charging infrastructure (Objective 5).

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Improved access to data and clarity regarding the government's data provision role

Meridian is supportive of EECA exploring ways to make data sets available to the market to improve infrastructure investment. In this respect we see the basic spatial approach proposed as a positive way to help inform and target applications for co-funding as well as to inform entirely private investments in charging infrastructure. However, we query whether EECA is best placed to develop a sophisticated model such as the data driven or digital twins approaches described in the consultation paper.

Sophisticated government modelling to present a singular view of customer demand and future network needs would come at a cost to taxpayers and would increase risk. If all co-funding and private investment was informed by a single government model, the weaknesses in the model assumptions may over time become the weaknesses in the market itself and result in less optimal outcomes for consumers. Meridian sees strength in a diversity of views and assumptions about customer demand and future needs. This diversity reduces risk and is a critical aspect of any emerging competitive market. Charging providers are already considering how to use data to better understand emerging customer demand and network needs and will make their own modelling assumptions about the future. Meridian does not think taxpayer funding of a singular government model to estimate future charging demand will benefit consumers. Instead, EECA could invest in providing market participants greater access to public data sets and empower them to use this data as they see fit to inform private investment decisions and applications for co-funding.

Greater transparency regarding the success criteria for applicants

It is not clear to what extent the proposed roadmap will guide funding applications and help EECA to determine who the successful funding applicants will be. EECA has a range of competing objectives for the public charging network, and it is not clear how these objectives are prioritised.

To enable more targeted applications for co-funding, it would be useful if EECA published more detail on the criteria to be applied including weighting, aligned to EECA's co-funding strategy and objectives. This would provide greater transparency for the market and taxpayers as well as enable applicants to assess the value of their applications before applying. Any roadmap (whether applying a basic spatial, data driven, or digital twins

approach) should not be the sole basis upon which co-funding applications are determined. The criteria applied should address all six objectives identified by EECA.

Understanding how the roadmap will encourage new entrants and competition for the provision of charging infrastructure (Objective 5)

Meridian supports Objective 5 to encourage new entrants and competition for the provision of charging infrastructure. We support a short-term roadmap but expect that in the long-term electric vehicle penetration will reach sufficient scale such that the market will be able to economically deliver the required charging infrastructure without any need for public funding.

The framing of the roadmap, in places seems to suggest a more permanent and significant role for the Government to allocate resources, pick winners and determine the shape of New Zealand's charging infrastructure. This would especially be the case if the Government chose to invest heavily in sophisticated models of charging demand rather than support the market to develop diverse views of future charging demand.

EECA should begin thinking now about an exit strategy so that it does not make funding decisions that risk perpetuating the need for ongoing taxpayer funding of Aotearoa's charging infrastructure. Public funding should be a bridge to enable a national charging network to develop in its early stages while electric vehicle uptake is low. However, public funding for electric vehicle charging should not exist in perpetuity (just as we do not publicly fund petrol stations today). Meridian considers competitive markets to be the most efficient means of delivering long-term benefit to consumers and the balance between public funding and private investment by market participants should be constantly reassessed by EECA.

Lastly, it is worth noting that the roadmap developed by EECA sits within a wider regulatory framework for electricity networks and roading networks. It is critical that government departments and agencies like MBIE, MOT, NZTA, the Commerce Commission, and the Electricity Authority work together to facilitate the development of an efficient, reliable, and competitive market for electric vehicle charging. EECA alone does not control all the available levers to deliver the best outcomes for consumers. The roadmap will need to work in harmony with other initiatives such as the Electricity Authority's efforts to improve the efficiency of distribution network pricing.

Please contact me if you have any queries regarding this submission.

Yours sincerely

Ben Priest
EV Product Manager

SUBMISSION ON *EECA - STATE OF CHARGE*

vector

Introduction

This is Vector Limited's (Vector) submission on the Energy Efficiency and Conservation Authority (EECA) consultation paper on developing a short-term roadmap for public electric vehicle charging, *State of Charge* (the Consultation Paper), dated October 2021.

We are happy to discuss any aspects of this submission with EECA. Please contact Matt Smith (Policy Advisor, Strategic Planning) at Matt.Smith@vector.co.nz or 09 978 7812 in the first instance.

No part of this submission is confidential, and we are happy for EECA to publish it in its entirety.

26 November 2021

General Comments

Vector agrees that developing a public electric vehicle (EV) charging roadmap for New Zealand will accelerate the electrification of transport and will better enable electricity distribution businesses (EDB) to support the transition to a low-carbon future.

The Climate Change Commission's demonstration pathway includes 46% of New Zealand's light vehicle travel and 36% of the light vehicle fleet being electric by 2035. This is in addition to the imperative to decarbonise industrial process heat. These shifts will increase demand for electricity significantly and quickly.

At the same time, New Zealand will increase its reliance on more intermittent renewable sources of generation and the integration of exporting technologies which enable bi-directional flows of power (vehicle to grid technologies, and solar and battery solutions). Managing this new demand, volatility and complexity will be critical for affordability and reliability – and in turn, for consumer confidence in a just transition.

Much of the impact of these changes will be concentrated on our distribution networks. Like the capillaries of our vascular system, distribution networks become more complex at the edges and are critical in ensuring that our electricity system achieves its mission of connecting all New Zealanders to power.

While the electrification of transportation (and heat) are expected to have significant impacts on low voltage distribution networks, the exact characteristics of those impacts are still unknown. Any effort to mitigate this uncertainty, such as a roadmap for public EV charging locations, presents an opportunity for distribution businesses to better optimise network planning and operations for customer benefits.

Vector supports EECA's efforts to improve the visibility of EV adoption as well as signal future sites for public EV charging infrastructure, which allows distribution businesses to enhance our forward planning processes to efficiently deploy solutions that meet the future capacity needs on our networks.

We agree with the importance of Objective 3 for the public charging infrastructure: ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met. Public EV charging infrastructure could offer the potential to improve system security through load shedding capabilities from their sites during grid emergency situations, much in the same way instantaneous reserves are used by the transmission system operator. Public charging infrastructure should include the capabilities necessary to enable this in the interests of improving system security in the future. These same capabilities could enable optimisation and load management services that the charging owner could offer into future flexibility markets in New Zealand as appropriate.

Vector looks forward to continuing work with EECA as well as electricity regulators, consumers, and other industry participants to ensure that the rollout of public EV charging occurs in an efficient and effective manner – and drives towards creating a new energy future.

EECA Consultation Template

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

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Organisation:	Vector, Ltd.

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Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   We agree that a short-term focus is appropriate, given the rapid changes occurring in both electric vehicle technology and rates of EV adoption in New Zealand.

2. Regarding EECA's objectives for the public charging network:

   Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

   We agree with the objectives and would like to emphasise the importance of Objective 3: "ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met".

   Public EV charging infrastructure could offer the potential to improve system security through load shedding capabilities from their sites during grid emergency situations, much in the same way instantaneous reserves are used by the transmission system operator. Public charging infrastructure should include the capabilities necessary to enable this in the interests of system security in the future. System security could be improved by distribution networks having the option to coordinate with public EV charging providers such that providers can offer load shedding capabilities from their sites in emergencies. These same capabilities could enable optimisation and load management services that the charging owner could offer into future flexibility markets in New Zealand as appropriate. In the first instance we support the recommendation for public chargers to have this capability to enable these potential benefits to be explored further, starting with the needs of consumers and the need to ensure public charging is convenient and available.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

We should let the data inform our decisions regarding the prioritisation of public charging investments, and work towards gaining a better understanding of the factors that impact vehicle charging behaviour, for example: differences in vehicle use between petrol cars, geographic differences (adoption rates, vehicle range impacts from weather and terrain, etc), consumer expectations for re-charging vehicles, and economic/cost factors.

While EECA's *Electric Vehicle Charging Survey*[1] did show that the threat of queuing for charging infrastructure acts as a barrier for EV adoption, the benefits of ultra-fast chargers will only be realised for drivers with EV capable of charging at high rates. Many of the more affordable EVs available in the New Zealand are not able to fully utilise ultra-fast charging. Without a significant education effort for new EV drivers they may end up "blocking" these chargers without realising that they are unable to utilise the ultra-fast charger at its highest value.

Better data around EV capabilities and EV charging behaviour as envisioned in Phase 2 will help clarify the needs moving forward. In our EV Smart Charging Trial we have learned that today's EV drivers use an EV just like any other car and often do not have access to another car. EV drivers also clearly indicated that the home is becoming the petrol station of the future, so support for enabling at-home (or near home) charging for all EV owners, including those that live in apartments or homes without off-street parking, is important.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

The consultation document proposes that "one of these options should be the basis for developing the basic spatial roadmap" in Phase 1. because "this basic spatial approach is not sophisticated enough to … add this functionality … due to the fundamentally manual nature of identifying charging locations using this approach". We believe that GIS tools offer a range of options to explore optimal charger deployment during Phase 1 of the roadmap development, which could lead to incorporating more than just one of the options as the basis of the basic spatial approach. The costs of exploring more comprehensive use of GIS tools for Phase 1 likely outweighs the costs of deploying charging infrastructure in the wrong locations, so we strongly support a deeper look at the capabilities within GIS.

We see the following risks and benefits for the different options from the perspective of an EDB:

Reducing the distance between chargers

Risks:

- potentially high costs to perform many small electricity system infrastructure upgrades

[1] https://www.eeca.govt.nz/insights/eeca-insights/electric-vehicle-charging-survey/

- Increasing range of EVs likely means this is decreasing in importance

Increasing the number of charging heads at existing locations

Benefits:

- possibly more cost-efficient upgrades to electricity system infrastructure

Prioritising journey charging

Risks:

- motorways could have large areas with limited electrical capacity nearby
- Evidence needed to show whether journey charging is still a barrier with 300-400km range becoming new norm

Benefits:

- can be targeted to complement at-home and slow charging

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

We agree with the proposed plan to develop a data driven EV charging roadmap. Having an open exchange between EECA, EV charging providers, and EDBs will allow EDBs to signal the areas on the network that can and can't be efficiently upgraded for new EV charging infrastructure. This exchange of information will also lead to better forecasting for EDBs and improve our planning processes leading to more efficient deployment of electricity infrastructure.

As part of our ongoing digitalisation efforts, we are actively working to make more information about our electricity network available through our public OpenData portal[2]. The portal currently shows Vector's electricity system assets via GIS and is planned to be further enhanced in 2022 with capacity and network planning information. We hope in the future this makes the information related to network planning, currently found in our Asset Management Plans[3], more useful and updated more frequently.

Project Tapestry is a Moonshot being championed by X, The Moonshot Factory with Vector and other global partners[4] which will take visibility of the network to the next level.[5]. This will enable virtualisation and simulation of electricity networks, better enabling the integration of distributed energy resources such as rooftop solar, batteries and electric vehicle charging. Whilst still in its early stages, the visibility offered by Tapestry could add significant value in informing an efficient public charging roadmap in the future.

[2] https://data.vector.co.nz/

[3] https://www.vector.co.nz/about-us/regulatory/disclosures-electricity/asset-management-plan

[4] Government Welcomes Collaboration between Vector and X. Press Release. 28 September 2021. https://www.beehive.govt.nz/release/government-welcomes-collaboration-between-vector-and-x;

[5] https://www.vector.co.nz/news/vector-collaborates-with-x

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

Vector has focussed our recent trials on home EV charging, with our smart EV charging trial[6] receiving funding from the Low Emission Vehicle Contestable Fund to support a second phase. We have also begun investigating heavy transport charging stations in collaboration with Auckland Transport for enabling electric busses[7] and electric ferries. We have also collaborated on preliminary investigations with a petroleum company to understand the implications of supporting EVs with co-located fast charging at existing petrol stations.

We see these types of requests as becoming more common and, as noted in our response to question 5, we have plans to make some of the base level information available on our OpenData portal so that investors, charging providers, and others are able to do preliminary studies with insight into constraints or planned development on our network without needing to make an official connection request.

Vector installed 16 public fast chargers in 2016, and while we already share data from those chargers through NZTA's EVRoam platform, we are open to discussions with EECA to review any additional data that may be available from those public fast-charging stations that could directly support the development of the EV Charging roadmap.

Vector has developed significant in-house capabilities in data analytics, as evidenced by our recent publication, *Towards customer-centric energy utilities - A granular data-driven bottom-up approach to understanding energy customer trends* in The Electricity Journal.[8] This details the development of Vector's granular customer model that underpins our network demand modelling used in our network planning process. The core value of our granular Auckland customer model was unlocked by linking data sets from different sources, as seen in Figure 1, to half-hourly smart meter data. The outputs from Vector's technology pilot studies (e.g. load management, EV charging etc) and the outcomes of behavioural research that we have undertaken is critical to keeping the model current and relevant to support our planning process.

[6] https://www.ena.org.nz/resources/publications/document/826

[7] https://at.govt.nz/media/1985010/aucklands-low-emission-bus-roadmap-version-2-october-2020.pdf

[8] Steve Heinen, Pieter Richards, *Towards customer-centric energy utilities - A granular data-driven bottom-up approach to understanding energy customer trends*, The Electricity Journal, Volume 33, Issue 9, 2020.

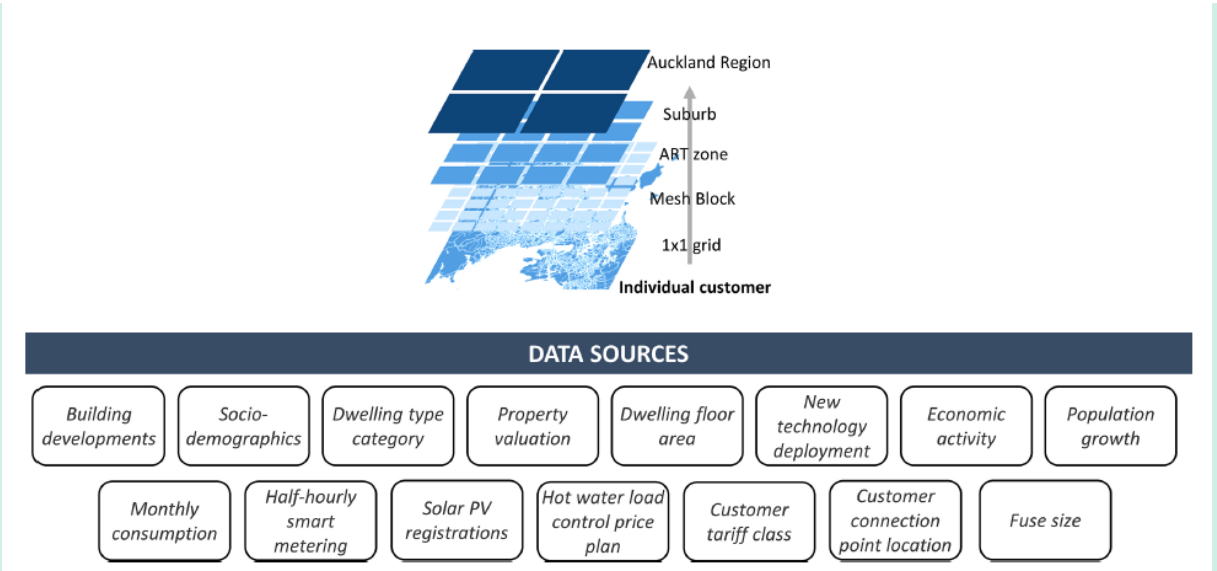

Figure 1 - Data sources and geospatial layers in Vector's Granular Customer Model

If you have any other comments you would like to include, please provide these below.

We are happy to meet with the team at EECA to see how we can support the development of the EV Charging Roadmap and discuss GIS tools or other data analytics we have discussed in our response. Given the impact on distribution networks expected from the electrification of transport, we have an evolving work programme to understand how drivers will use and charge electric vehicles. We welcome working with the public and private sector on research questions and are open to more formal engagements with like-minded industry and government bodies to support the electrification of transport.

5 Community groups

Bay of Plenty EV Owners Facebook Group

The Nelson Transport Strategy Group (NELSUST) Ltd.

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

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Phone number:	021 0789 538
Organisation:	Bay of Plenty EV Owners FB Group

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   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   [Insert response here]

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   [Insert response here]

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

   Yes I agree the future is in multi Ultra Fast charger sites but slo please do not forget smaller remote sites like say Katikati, Ngatea, Bemnnydale or Whangamomona that desperately need EV charges but would not justify the investment,... or maybe not have to electricity supply either. Sites like this, a 50kW (or a pair) would more than do for the foreseeable future

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

   From a personal situation I see that map are looking at the rtout from Auckland to Taura

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

   [Insert response here]

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

   [Insert response here]

If you have any other comments you would like to include, please provide these below.

[Insert response here]

SUBMISSION to EECA

On Public EV Charging in NZ

From:
The Nelson Transport Strategy Group, (NELSUST) Inc.

www.nelsust.co.nz
c/-10 Ralphine Way
Maitai Valley
Nelson 7010
Peter Olorenshaw Convenor
tel: 546 6176, 027 628 1686
email: petero@inspire.net.nz

PUBLIC INFORMATION STATEMENT:
We are happy that our submission is included in reports available to the public.

INFORMATION ABOUT NELSUST:
We are an incorporated society of 300 people who are focussed on sustainable transport. This submission is the result of committee discussions about EV charging.

1.Introduction

Pleased to see this consultation

1.1 Average Charging Distance Poor metric for adequate provision of charger spacing. What is important is maximum distance. When you have a 2012 Nissan Leaf with an effective 90km range on the open road as the writers daughter has, what use is an average figure of 75km distance between chargers when this hides that some will be 120km apart? You will be stuck on the side of the road, out of charge. You must change this to a maximum of 75km apart on all state highways. Here in Nelson our major destination is Christchurch yet the distances between the current (single) 50 kW "fast" charger at Murchison and the next "fast" charger at Culverden, the other side of the Lewis pass is 192km. This is simply not doable in a vehicle without a large battery. If we are going to get to the EV penetration that the CCC suggests is necessary for their emissions pathway, we can't have such massive gaps in the charging network. It is iniquitous to not cater for those with more limited budgets with older smaller batteries EVs to be shut out of major routes like this. We are aware the Grid needs to be upgraded, or a stationary battery installed, trickle charged overnight to enable fast charges to be installed at Springs Junction and Boyle village too ideally.

1.2 Equity of Access Demands Widespread Chargers Your focus on most chargers where most motor vehicles is not equitable. Those who live in rural areas will be very poorly served by this model. This government has a focus on wellbeing, on equity, on leaving no-one behind. Your proposals are a poor fit with this.

1.3 Significant change charging Later model EVs We are concerned that you recognise the significant changes that have occurred with newer longer range EVs. Where a 50kW "fast" charger can fill up a 24kWh Nissan Leaf in 1/2 an hour, many new EVs are coming out with 60kWh batteries and above. A number of times now the writer has pulled up at a "fast" 50kW charger to have the heart sin when it becomes clear that it is a Tesla or a Jaguar there on the charger already and with their big batteries are likely to be there on the charger for an hour (50kW charging, 70kWh battery, they are going to be there for more than an hour with a depleted battery). Two things come from this:

1. If you put in a fast charger do what Tesla does in put in at least 4 so you can generally be guaranteed that there will be a free charger for you to use.
2. Put in faster chargers that are more suitable to the bigger batteries cars from now on: You shouldn't be putting in anything less than 300kW chargers so people with big batteries cars don't have to wait an inordinately long time. While any charger is better than no charger, its still a pretty retrograde step having to wait an hour to charge up. If we are going to get the increase in

EV use the CCC aspires to, charging times need to be convenient and not so different to a fossil vehicle. While taking a 1/2 hour break every 400km might be completely acceptable, having to have a wait of over an hour every 400km will not find acceptability with many people. The chargers need to be 300kW really.

1.4 Cost of Charging - The cost of some fast chargers really seems to border on price gouging. It should be related to the cost of supply including time of use pricing to help flatten out the grid peaks.

1.5 Cater for Heavy EVs too We think you need to cater for Heavy EVs too. Their needs are significantly different - ultra fast chargers necessary, being able to manoeuvre a large truck into position to charge etc.

END

6 Government

KiwiRail

Two additional submissions from a government entity have been withheld at their request.

10 December 2021

Energy Efficiency and Conservation Authority (EECA)
Level 10 AIG Building, 41 Shortland Street
Auckland, New Zealand

Tēnā koe Basil Issa

KiwiRail submission: 'State of charge' consultation document

This letter outlines the KiwiRail response to the recent EECA consultation paper, State of charge, on developing a short-term roadmap for the public electric vehicle charging network. We appreciate the date for submissions has now passed and provide this feedback for the awareness of EECA in respect of our position.

KiwiRail is committed to supporting New Zealand's goal of achieving a net zero carbon economy by 2050. As a commercial enterprise operating throughout New Zealand, we have a unique role to play in enabling ongoing improvement in the emissions performance of the rail sector and subsequently the transport sector.

We broadly support the six objectives for the public charging network and believe KiwiRail would be able to help meet some of these objectives. Our property portfolio runs the length of New Zealand and is ideally positioned to provide low emissions transport infrastructure (EV charging). We want to raise the following key points for your consideration:

- KiwiRail is one of New Zealand's largest landowners. Our property is often situated close to the State Highway network (including the Interisland ferry terminals) and local roads, presenting an opportunity to provide EV charging sites for the public.
- We have around 700 active installation control points (ICPs) across the country ranging in different supplies (i.e., signals, level crossings, stations, facilities etc.) and capacities, with over 100 touching grid exit points (GXPs) – which we understand to be nearly half of New Zealand's total GXP's. Further investigation would identify the number of locations suited to providing EV charging.
- Currently there is a gap in the EV charging infrastructure for journey charging, particularly when driving long distance from e.g., Auckland to Wellington or Christchurch to Dunedin. KiwiRail could make sites available along these key routes to establish commercial destination charging and/or journey charging. KiwiRail is also planning for EV charging on the new Interisland ferries expected for arrival in 2025/26. This will enable the growth of electric campervans and rental vehicles, which in turn will support New Zealand's reputation for a clean, green tourism experience.
- The national rail network extends the length of New Zealand, is in every region, reaches every major city and is in most towns in New Zealand. KiwiRail has a long-term lease on the network which enables us to operate the railway while realising the full commercial benefit of the land. KiwiRail land will be ideally suited to

charging infrastructure and we offer the benefit of dealing with one party to access nation-wide sites.

- KiwiRail's land holdings could also cater for other future low emissions infrastructure if required, such as hydrogen refuelling.

In summary, KiwiRail would be open to providing locations for public fast EV charging infrastructure and feel our unique property portfolio is well positioned to be a priority location for investment. We are open to exploring partnership opportunities in getting sites established.

We would be happy to speak with officials directly regarding this submission.

Ngā mihi nui

Louise Pengelly

Group Manager Strategy and Transformation

7 Other

Blackcurrent and Arcanum

Foodstuffs NZ Ltd

Resilienz Ltd

One additional submission from another organisation has been withheld at its request.

Submitter information

EECA would appreciate if you would provide some information about yourself. If you choose to provide information in the section below, it will be used to help EECA understand how different sectors view the public EV charging roadmap proposal. Any information you provide will be stored securely.

Your name, email address, phone number and organisation

Name:	Matt Strik
Email address:	matt@blackcurrent.io
Phone number:	027 209 0209
Organisation:	Blackcurrent and Arcanum As required under the instruction for submission the following is a brief overview of Blackcurrent and Arcanum. **Blackcurrent** is an innovative product-led, customer focussed and data driven company. Having identified a gap in the energy market we have built a product offering that is unique, simple and innovative. Unique because we are independent with no vested interest in how energy is generated, distributed or consumed, we are on a mission to simplify and innovate by putting the knowledge and power in the hands of our customer. Our vision is an electrified, decarbonised future that optimises existing distribution capacity and promotes local generation and storage to match growing demand. We see data as the key to deliver on the following aims: • Enable customers to take control of their world; to use power in cleaner, more flexible and more efficient ways. • Accelerate electrification and decarbonisation. • Promote local generation and storage to match growing demand and complement existing capacity

- Optimise use of existing distribution capacity and infrastructure – this benefits end users and network companies

Wellington based Arcanum is a platform that help's SaaS companies rapidly and cost effectively add 'out of the box' AI/ML powered features and insights into existing software. Arcanum also has a service offering for the development of new AI/ML capabilities for integration into existing software or as part of an insights/business intelligence program. Arcanum has proven capability across structured data, time series data, document/text processing and video/image processing.

The executive teams of Blackcurrent and Arcanum have approved this joint submission.

☐ The Privacy Act 1993 applies to submissions. Please tick the box if you do **not** wish your name or other personal information to be included in any information about submissions that EECA may publish.

☐ EECA may upload submissions and potentially a summary of submissions to the website, **www.eeca.govt.nz**. If you do **not** want your submission or a summary of your submission to be placed on this websites, please tick the box and type an explanation below:

We are happy for our submission and related personal information to be published by EECA

Please check if your submission contains confidential information

☐ I would like my submission (or identifiable parts of my submission) to be kept confidential, and **have stated** my reasons and ground under section 9 of the Official Information Act that I believe apply, for consideration by EECA.

Consultation questions

1. Regarding the scope of this document 'the provision of fast public light EV charging infrastructure in the short-term (about five years)'

   Do you agree with the scope described above? Can you suggest any changes? (Page 7)

   In principle we **AGREE** with the scope described in the document noting the following:

   - On the 5 year period for the plan
     - We agree with the need for a substantial timeframe, however would take this further and advocate for the implementation of persistent solutions which will deliver ongoing insight to track uptake, changes, usage as EV demands change over time – up to and beyond the intended 5 years.
     - Another consideration for the 5 year timeframe is the likelihood of a customer taking two steps to transition to full EV; with a first-step being adoption of a plug-in hybrid vehicle. Understanding the likelihood of this, and the relative impacts could influence the model. As an example rural vs urban consumers could have different preferences based on charging infrastructure available in their local area.
   - Public Journey Charging
     - It is important to account for how NZ drivers currently manage long journeys. While the majority adhere to main highways, there are also large numbers who actively seek alternative (back) routes to avoid traffic or just keep things interesting. In this regard it is important that these behaviours are accounted for, as the lack of charging infrastructure on these routes will impact range anxiety and potentially push more traffic volume onto main highways.
     - Qualitative data about how people travel is also important – most people won't continue driving until their petrol tank is empty, so we shouldn't expect this ingrained behaviour to change for EV's, and instead look at how people travel and expectations on the types and duration of stops at different times, e.g.
       - travel ~1.5-2hrs or ~200ks and stop for a quick coffee break lasting 10-20mins.
       - Go again – stop for lunch, then complete journey

       Charging infrastructure then needs to be located with chargers that deliver a suitable recharge in the preferred time frame near appropriate rest/recharge facilities and amenities such as cafes, playground and rest areas etc. Options being key

- Why fast chargers? We agree with this scope item and suggest timeframes and behaviours above should be quantified to support the identification of the required size charger – however expect this to be closer to the 300kW or 10min charge

- Light EVs – the roadmap and supporting data need to consider larger capacity vehicles and the inevitable introduction of larger SUVs and utility vehicles that will likely come with increased capacities as availability of these in NZ will no doubt drive uptake. While these could be seen as light commercial, the realty is these types of vehicles are the preferred option by a large number of kiwis today.
    - Other considerations – towing vehicles eg taking the boat from Auckland to Whitianga or Wellington to Taupo
    - As more light commercial EVs and even heavy EVs become available, then these will also require charging infrastructure with supporting facilities – these could well or even should be placed alongside the general public infrastructure to optimise use
- Why Short term? We agree that an initial 5 year period is a great start, but suggest that this needs to set a foundation that change will be measured against for the following 5-10 years to allow for ongoing changes to be monitored and the plan adjusted. As such persistent solutions would be a preference

2. Regarding EECA's objectives for the public charging network:

   Objective 1: Support EV uptake and provide consumers with confidence in the availability of public electric vehicle charging infrastructure

   Objective 2: Provide all users with safe and convenient access to charging infrastructure

   Objective 3: Ensure charging infrastructure standards such as interoperability, connectivity and energy efficiency are adequately met

   Objective 4: Provide the government and industry information and guidance to better inform planning and optimal investment

   Objective 5: Encourage new entrants and competition for provision of charging infrastructure and service providers

   Objective 6: Enable innovation in new technology and business models

   Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives. (Page 9)

Overall we **AGREE** with the objectives noting the following:

- Objective 1 – In order to give consumers confidence, data needs to take into consideration the drivers' current travel behaviour and preferences. The subsequent roadmap should then enable the provision of infrastructure in the locations they are used to traveling through, and to, with charging durations that add as little additional time as possible to the overall journey.
- Objective 4 – it is essential to include local network company infrastructure and constraints in the data set. Once the preferred sites are identified, it is necessary to understand:
    - the capacity that is available locally to enable the required chargers, or
    - that alternative capacity options such as generation (e.g. solar) or storage (e.g. batteries) can be considered to supplement existing network infrastructure.

  This data is not readily accessible based on the limited- to no-monitoring of low voltage transformers across the various local network companies.
- Objective 5 – similar to the previous point, understanding the capacity impacts associated with the introduction of fast DC charges needs to be well understood to ensure the integrity of electricity supply to both the intended location and surrounding area. It is possible to have too much of a good thing if this is not well planned.

3. **Do you think that the government should prioritise its public charging investment in high power ultra-fast chargers? (Page 14)**

In short – **YES**.

Ultra-fast chargers are most likely to fulfil the expectation of consumers who have used their carbon-fuelled vehicles in a particular way for a long time. These entrenched behaviours are a significant factor in range anxiety and perceived recharging inconvenience that should also be considered in the scope of this project and the subsequent charger network design.

4. **Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option? (Page 14)**

With the regards of the three proposed options for identifying charger locations, we prefer the **third option** – prioritising journey charging – as this has best alignment with current travel behaviours.

- As stated previously, taking a customer point of view to this exercise will have an influence of where chargers should be placed.
- The other overlay necessary to factor in is the availability, or lack of capacity in the area to support charging infrastructure, and the timeframes and cost for additional network capacity to be made available as required – some of which may require significant upstream infrastructure investment and planning & implementation delays.
- Understanding both costs and timeframes are necessary to allow alternative capacity options to be considered as local generation and storage could be economically viable and realistically achievable.
- If decarbonisation impacts are to be considered, then the model should also recognise that increased electrification of transport may rely heavily on increased use of coal to generate electricity in the short term.
- Using existing service centres is a solid option as infrastructure is already in place to cater for people waiting (drinks, food, bathrooms etc). These sites should be monitored to understand available capacity needed for charging infrastructure.
- People will want to do something while they wait, so if reducing distance between chargers it would still be beneficial to focus on areas with existing infrastructure to cater for these needs (more likely around urban areas and existing service centres or truck stops)

Risks

- Increasing the number of charging heads will require additional capacity (recommendation: should monitor sites to understand current capacity & demand & usage charging profiles)
- Prioritising Journey charging is unlikely to meet the needs of light commercial vehicles as these will require higher density of chargers around urban areas. Also there is likely to be optimal electricity infrastructure options closer to urban areas to allow for chargers to be installed without expensive infrastructure upgrade costs

5. **Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements? (Page 16)**

Yes, we agree with the data-driven approach. A suggested improvement is that the data sets for the economics of chargers also includes the cost of the electricity network infrastructure capacity upgrade required – optimal locations may need to deprioritised if network infrastructure upgrade costs are in the millions per site. Part of the data set used should be current capacity utilisation at and around potential sites to optimise selection.

6. **Has your organisation undertaken any work in this area (modelling of EV charger locations) or do you have data sources that could be used as inputs? (Page 16)**

Blackcurrent has completed whole-of-site assessment to enable the successful introduction of EVs without impacting the existing operation of the site for its customers. This assessment can be applied to EV charging network planning as the specifics of the individual sites is vital to fulfil the plan.

Use of the Blackcurrent & Arcanum data & analytics services will initial provide data on capacity in the target areas, in the context of what is being consumed and when vs the available pool. Once the profile is established changes, such as introduction of new chargers, can be measured and fed back to refine the plan. We see this as being a crucial input to ensure the plan continues to evolve over its 5 year lifecycle, and also provides a solid baseline for the following 5 – 10 years.

If you have any other comments you would like to include, please provide these below.

We have no further comments at this stage

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25 November 2021

Public EV charger roadmap
Evidence, Insights and Innovation
Energy Efficiency and Conservation Authority
Wellington

Sent by email: publicevcharger.roadmapconsultation@eeca.govt.nz

Dear Sir/Madam

Submission on Consultation paper on developing a short-term roadmap for the public electric vehicle charging network

1. This submission is made by Foodstuffs (NZ) Limited on behalf of Foodstuffs North Island Limited (FSNI) and Foodstuffs South Island Limited (FSSI), which are 100 per cent New Zealand owned retailer co-operatives. The regional co-operatives jointly own Foodstuffs (NZ) Limited (Foodstuffs) which represents the co-operatives interests in national policy and input on public policy matters.

2. The Foodstuffs co-operatives own and develop retail stores which are franchised to co-operative members. Our retail brands include PAK'nSAVE, New World, Four Square, Raeward Fresh, On-the-Spot, Henry's Beer Wine and Spirits, and Liquorland. Foodstuffs also has large transport operations, primarily servicing secondary freight to member stores

3. Foodstuffs welcomes the opportunity to submit on the Energy Efficiency and Conservation Authority (ECCA) paper *State of charge: Consultation paper on developing a short-term roadmap for the public electric vehicle charging network* (Consultation Paper).

4. Foodstuffs intends to transition its light vehicle fleet to electric vehicles as part of its own emissions reduction plan. We host ChargeNet chargers across 92 supermarket sites nationally and also have charging facilities for our employees to use at a number of our business sites.

5. Foodstuffs supports ECCA's proposal to develop a roadmap of the future rollout of the public EV charging network to reflect how the Government (and ECCA specifically) is planning to approach its investment in fast public light EV charging infrastructure over the next five years. Foodstuffs is of the view that a significant focus to help New Zealand reduce its transport emissions should be on the electrification of light vehicles, given these vehicles already exist in the marketplace today.

6. The Ministry for the Environment consultation, *Te hau mārohi ki anamata: Transitioning to a low-emissions and climate-resilient future: Have your say and shape the emissions reduction plan,* proposes to increase zero-emission vehicles to 30% of the light fleet by 2035. We support this target for the Emissions Reduction Plan and believe that it could be more ambitious as there are already a number of tools available, such as the Clean Vehicle Discount Scheme, to encourage New Zealanders to take steps to reduce transport emissions. However, good availability of journey charging points for light electric vehicle (EV) users is necessary to mitigate against range anxiety and to encourage EV uptake. Therefore, we support ECCA's work in this regard.

7. It is noted that ECCA's public charging roadmap work is to align the work that Te Manatu Waka/the Ministry of Transport is doing in conjunction with Waka Kotahi /New Zealand Transport Agency, the Ministry of Business, Innovation and Employment to develop a longer-term national electric vehicle charging infrastructure plan. We support the development of a national plan as it will be essential to give the public and businesses the confidence to invest in EV vehicles.

8. Until the longer-term national electric vehicle charging infrastructure plan is developed, the ECCA roadmap will help provide confidence not just to members of the public, but also to businesses, as they transition their fleets to electric and plug-in hybrid electric vehicles.

9. The Consultation Paper states that heavy EVs are not within the scope of the roadmap as consideration of the future heavy EV charging network will take longer, considering the limited number of electric heavy vehicles available on the market and the potential development of other low emissions technologies such as biofuels and hydrogen. However, we welcome the proposal that the new infrastructure could include the potential to accommodate heavy vehicles in the future.

10. We broadly support the six objectives detailed in the Consultation Paper that will inform the roadmap. We also support the commentary that there may be an increasing need for high power ultra-fast charges with multiple charging heads as demand increases.

11. Foodstuffs takes this opportunity to acknowledge the work EECA has done to help reduce transport emissions through EECA's support of the rollout of public charging EV infrastructure.

Yours sincerely

Sarah Tuohy
Public Policy Manager

SUBMISSION ON "STATE OF CHARGE" CONSULTATION ON AN ELECTRIC VEHICLE CHARGING ROADMAP 2021 11 26

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INTRODUCTION

We offer our general endorsement and support

We compliment both EECA and the government on their various initiatives in promoting the transition to an electrified light vehicle fleet, and we welcome this further consultation.

We note in particular the level of success of the strategy, in conjunction with private service providers, of installing rapid chargers at 75 km intervals on the state highway network.

We are also in agreement with many of the approaches outlined in the consultation.

But we are deeply concerned over a serious blind spot.

For some time Resilienz has held major concerns over the failure of the public charging network to cater well for a just transition[1], and these concerns have been heightened by aspects both of the consultation document itself and of EECA's October 2021 "*Electric Vehicle Charging Survey"*.

We cannot escape the conclusion that, for a variety of reasons, there is a significant blind spot in regard to pursuing a just transition in the conceptual and practical development of the public EV charging infrastructure.

Given the critical importance to our climate strategies of successfully decarbonising the vehicle fleet (expressed clearly in the opening paragraph of the consultation document as *"…essential if we want to meet our emissions reduction targets…*"), and the widely proclaimed need to ensure such strategies provide for a just transition, **it is of strategic importance to address this blind spot**. **Otherwise our system is at serious risk of building in impediments to the very change it is trying to promote**.

While our concerns centre on the cost structure of public charging, it would be a serious oversight to think that the development of a shorter-term roadmap for journey chargers can or should be independent of that issue.

[1] Resilienz Ltd. is conducting an investigation into the cost structure of public EV chargers. The attached draft report "DRAFT DISCUSSION PAPER ON THE COST OF PUBLIC E.V. CHARGING: A POTENTIAL IMPEDIMENT TO RAPIDLY DECARBONISING ROAD TRANSPORT" is of a pilot study that was completed in June 2021. We are currently conducting further investigation, including further trials, and engagement with players in the sector such as EECA, ChargeNet, and Flip the Fleet.

THE "BLIND SPOT".

Our concern has been brought into focus by the intersection of the time-plus-power cost structure of typical public chargers with the typical range and battery characteristics of older EVs (likely to be owned by lower socio-economic sectors of society). The accompanying Resilienz pilot study goes into this in more, albeit preliminary, detail.

The main reasons this concern has been heightened by the current round of EECA documents mentioned above are:

1. Notwithstanding the survey clearly addressing "older EVs" in their own right, in many ways the consultation itself has bypassed the views and needs of the social sector likely to be worst affected (as very few will be current EV owners);
2. To the extent that the survey might represent their views (as owners of older EVs) the findings of the survey are largely negative.
3. That the suggested responses in the consultation document (e.g. home-based EV charge points; and ultra-fast chargers) likely have relatively limited relevance to the social group of concern.
4. There is only limited recognition of the disproportionately escalated financial and logistic problems faced by people who drive shorter-range EVs on "journeys" – leaving open the perhaps unkind inference that EECA's main concern is ensuring that such journeys are tailored to the needs of the better-off (which by implication own newer, longer-range EVs).
5. That responses have in various places recognised the issue of queues as being of greatest concern in the survey, but there is little reaction to cost even though that is of second greatest concern.
6. While recognising that queuing at chargers is clearly of real concern, the recently introduced solution by ChargeNet of "idle charging" only exacerbates the problem for poorer people (e.g. the need to charge more often and more fully).
7. It is salutary that, even with the demographic covered in the survey, 78% of owners of older vehicles felt constrained not to go on longer journeys. The info box on p. 15 is clear on that, and this echoes comments made to Resilienz in the course of our research.

We thus see it as fundamental that all strategies, including this shorter-term, journeys-focussed one, strongly address the inherent and escalating social inequity becoming ever more deeply embedded in the emerging public charging infrastructure.

CONSULTATION QUESTIONS

3.0 SCOPE

CONSULTATION QUESTION

1. Do you agree with the scope described above in sections 3.1, 3.2, 3.3, and 3.4? Can you suggest any changes?

3.1 Why public charging?

We agree with the general scope of this question although feel that the distinction between journey and destination charging is to some degree arbitrary (e.g. the writer recently drove a "journey" from Nelson to Christchurch in an ENV200 with only a 24 kWh battery, and charged respectively at Havelock, Blenheim. Ward, Kaikoura, Cheviot and Amberley. Arguably only Ward and Cheviot would not also be considered "destination" chargers although all of them formed a key element in my own journey.)

3.2 Why fast chargers?

While agreeing with the general thrust of providing faster chargers with multiple heads, we do not agree with the overall dismissal of lower-power (AC) chargers. In the context of lower-range vehicles, the ability to top up (even slightly) at intermediate points can not only be valuable but also make the difference between someone being willing to commit to a journey or not.

Given that such chargers are generally notably cheaper to install, and that they can also perform useful local functions (e.g. at a rural school or popular local reserve), their role in journey route planning, and especially for shorter-range EVs, should not be underestimated. (To give an example, on the occasion I recently visited the Christchurch Adventure Park, all destination chargers were in use).

We also note that the provision of chargers adjacent to rural cafes and the like has considerable benefits for both the café and the travellers. The situation at Ward is a case in point.

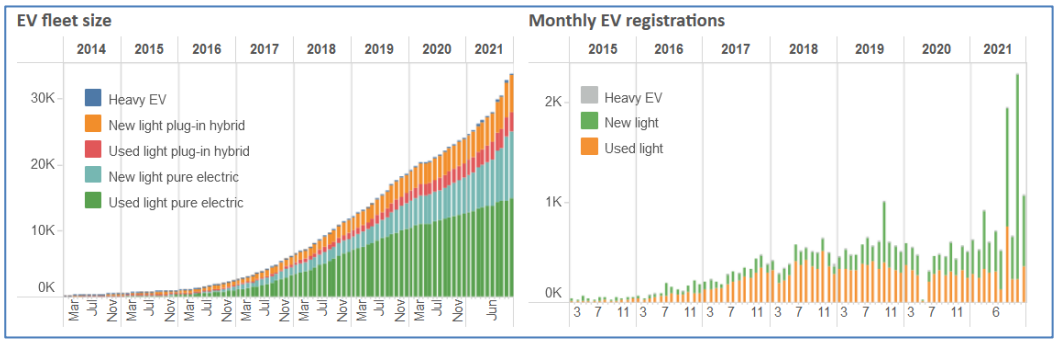
3.3 Why light EVs?

While catering for light EVs is clearly an important part of decarbonising transport we do not find that the data provide gives a clear enough basis to comment on the adequacy of the scope.

For example, with regard to Figure 2, there is commentary neither on the relative merits or validity of the three curves shown (although presumably the CCC one should be taken as the

most authoritative in relation to meeting emissions targets), nor on the relationship between the growth curves shown and the likelihood they can be achieved (such as the remarkable 35% increase per annum the CCC curve seems based on.)

The right hand chart in the graphics below (from https://www.transport.govt.nz/statistics-and-insights/fleet-statistics/sheet/monthly-ev-statistics) shows average EV registrations currently sitting at say about 600/month, whereas the CCC curve above requires about 10,000/month by 2027. (Although hopefully the few much higher months augur well for the future in that regard.)



We are also not in favour of fully disregarding potential needs of the heavy vehicle fleet, and are strongly of the view that this should at least be considered strategically when evaluating light vehicle charging installations.

For example a classic strategic gap in the upper South Island is at Springs Junction in the Lewis Pass area. The current impediment to installing a rapid charger at this “obvious” location is the lack of an adequate mains power supply to the settlement. If a decision was made to upgrade the power supply (which we would endorse), it would clearly be prudent to at least consider the implications of catering for the future load for charging heavier vehicles.

3.4 Why short-term?

While we agree generally with the need to include a short-term view, we do have some very serious reservations about adopting that in as limited a fashion as seems implied in the document.

This consultation is to support a fundamentally important climate strategy with long-term implications which have exceptionally high (existential) stakes, and we cannot afford to do less than maximise our effectiveness. Given that infrastructure decisions have notoriously long-term consequences (e.g. the route of many parts of the London Underground were determined by roading decisions made by the Romans 2000 years previously) it is thus imperative not to make short-term decisions in isolation from longer-term considerations. (We acknowledge that Objective 4 encompasses this to some extent).

Another important reservation is that the abovementioned blind spot is centred on pursuing a just transition, but that issue will not become evidence for some time (because its emergence will in large part be a function of the progressive availability of cheaper EVs in the second-hand market).

As it seems likely that the short-term planning may result in infrastructure with long-term implications, we emphasise that the conceptual stage of the short term planning should encompass a much longer perspective. This is especially so as the opinions of those future EV users will not have been captured in the recent survey.

We also reiterate that matters like upgrading power supplies, as outlined above, should not be viewed as, or constrained by, short-term issues just because of, say, uncertainty over future heavy vehicle charging strategies.

4 OBJECTIVES

CONSULTATION QUESTION

2. Do you agree with objectives 1 to 6? Please provide comment on if we have missed anything or if you consider there are higher priority objectives.

Objective 1 Support EV uptake

We strongly endorse this objective but note again that the focus on addressing queuing seems to be partially obscuring other important issues such as location and cost. Thus this objective needs to be widened so that resultant strategies address the critical needs of people who can't even reach the next charger, or struggle to afford the cost if they can reach it, as well as reducing inconvenience for existing users.

Objective 2. Provide safe convenient [equitable] charging access

We have added "equitable" in the objective because it is mentioned in the text, deserves prominence, and needs a wider interpretation than the geographic sense in which it is discussed.

We agree with subsidising chargers in low-volume areas to provide geographical equity, to enable strategic chargers where set-up costs are otherwise prohibitive, and also to optimise the social equity of the resultant network.

We also have serious concern at the prospect that the public purse subsidises the less-profitable locations while it seems from our preliminary analysis that charging at the more highly used ones virtually amounts to profiteering, and quite possibly compromises a major decarbonisation initiative in the process.

"Affordability" is mentioned as part of this objective and, while strongly endorsing what we believe this means, we note that there is no framing context by which to judge the soundness of that reference.

Objective 3 Ensure sound technical performance

We strongly support this objective

Objective 4 Ensure sound technical performance

We strongly support this objective.

Objective 5 Encourage competition

While broadly sympathetic with this objective, it is crucial to frame the issue as far more important than the "commercial considerations" that the document seems to accept should prevail, and far more important than "making it easier for charging providers to participate".

The entire decarbonisation of our transport fleet is a key strategy in trying to avert the most catastrophic effects of the climate crisis. If participating companies are unwilling to act in that spirit then the respective players should not even be part of this process.

With that fundamental proviso, we endorse the thrust of this objective, but highlight that cooperation likely has a more important role to play than competition in tackling the climate crisis.

Objective 6 Enable innovation

We strongly endorse the general thrust of this objective.

However we consider the framing of the way innovation should be targetted is needlessly narrow, does not include some of the matters we have raised as important, and is, ironically, thus restricting innovation to some degree**.**

5. EV CHARGING ROADMAP

CONSULTATION QUESTIONS

3. Do you think that the Government should prioritise its public charging investment in high power ultra-fast chargers?
4. Are there risks or benefits that you can see regarding the three options for the basic spatial approach (reducing distance between chargers, increasing the number of charging heads at existing locations or prioritising journey charging)? Can you suggest an alternative option?

3. Focus on high-power ultra-fast chargers

While we see the need for these, recognise their increasing relevance for longer-range vehicles, and are aware of the benefits in strategic locations, we do not encourage such a strong focus in this area.

We are of the view that there should be a stronger emphasis on balancing charging speed with the number of outlets, and the social equity of charger cost and location.

To some degree a strong focus on ultra-fast chargers is geared to the more affluent and business-oriented users, and this should not come at the expense of measures that promote wider uptake of EVs and a just transition, which will also promote the replacement of older, less-efficient ICE vehicles with EVs.

4. Three options of the spatial approach

We consider the main priority should be to set a realistic minimum distance between chargers on main routes and then focus on multiple-head chargers as a means of reducing waiting times.

We consider the already-used 75km is not an unreasonable minimum distance. We also highlight that charging infrastructure on some less-used routes may still be a key top accessing entire regions with EVs. The West Coast of the South Island is a clear case. Additionally, providing alternative routes with good charging facilities could become a key facet of national resilience in the event of a major event (the Kaikoura earthquake being a clear illustration). This will become even more critical as the country progressively switches to pure EVs with fewer hybrids.

In tandem with this we encourage consideration of a distinction between rapid chargers and lower-speed AC chargers with a likely approach of locating AC chargers in locations where distances may augur against low-range vehicles and/or at natural destinations where “top up” charging can occur in tandem with other activities (e.g. a visit to a popular reserve).

In this regard we again stress the need to be fully cognisant of the escalating cost and logistics of journeys in lower-range EVs (see item 4 under “Blind Spot). We also note that “Commando” campground chargers, while fairly plentiful, require an additional cable that is likely to cost around $1000, which can be a real deterrent to lower income families (unless a Commando adapter is used with a normal household cable, in which case it must be accepted that the charge rate is then only that of a normal 10 Amp socket).

While we consider there should be some emphasis on filling the gaps on the journey routes (and we note in Figure 5 the pronounced difference in current charging availability in the East Cape region in contrast with the West Coast of the South Island) we also refer to our prior comment that in many cases – e.g. where there are small towns en route – differentiating between journey and destination chargers is of little consequence.

CONSULTATION QUESTIONS

5. Do you agree with the proposed approach for developing a data driven or digital twins based public EV charging roadmap? Can you suggest any improvements?
6. Has your organisation undertaken any work in this area or do you have data sources that could be used as inputs?

5. Digital twin approach

No comment

6. Do we undertake work in this area?

While not specifically in the area being referred to, our work on public charging costs, such as the attached draft being supplemented by trials of journey charging, has relevance for some of the broader connotations. We would be pleased to discuss this further if of interest.