

Summary of submissions: Improving the performance of electric vehicle chargers

A green paper seeking input on ways to improve the energy performance of electric vehicle chargers

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Purpose

This document summarises and provides a record of submissions received from the Energy Efficiency and Conservation Authority's Green Paper "Improving the performance of electric vehicle chargers".

This document sets out:

- a. The number and type of submissions received,
- b. The overall themes and key messages from submissions,
- c. Responses received in response to the green paper's consultation questions,
- d. Other matters raised as part of the consultation.

Background

EECA's role is to encourage, promote and support energy efficiency, conservation and the use of renewable energy through regulating energy-using products and providing information and incentives to encourage smart energy choices.

In 2021, MBIE sought submissions on proposals to improve the regulatory regime for energy-efficient products and services including a package of proposals to ensure EECA's purpose remains fit for purpose. This includes requirements related to demand response as an enabling first step.

New Zealand's electricity demand is expected to increase significantly, particularly as New Zealand moves to electrify its transport fleet, and modelling across several government sources expect electric vehicle (EV) uptake to increase rapidly. The increasing number of electric vehicles, and the subsequent number of people charging at home, will play a significant role in increasing electricity demand, presenting risks to the electricity grid including power cuts and reductions in power quality. Electricity Distribution Businesses (EDBs) would need to undertake costly infrastructure upgrades, the costs of which are distributed amongst all connected consumers.

Electric vehicle (EV) chargers that are 'smart' or demand response capable (chargers that can engage with the electricity system and respond to market signals by changing when and how they use electricity) can play an important role in managing intermittent renewable supply and managing peak demand, both of which are essential to improving energy security, affordability and reducing emissions.

New Zealand stands the best chance of realising this potential now if we start planning for an increase in EVs and EV chargers now, while we can influence the types of chargers installed.

What we did

Green paper development

EECA drafted a Green Paper to gather information from industry and other industries about the EECA's role in supporting the uptake of smart and energy-efficient chargers. The green paper included 15 targeted consultation questions that focussed on:

- a. EECA's engagement principles for EVs,
- b. Proposed specifications for smart chargers in New Zealand,
- c. Proposed options to encourage the uptake of smart chargers in New Zealand, and
- d. Other insights that could be provided to EECA to support our thinking on the matter.

The green paper was developed in consultation with key partners including the Ministry of Business, Innovation and Employment and the Electricity Authority, and was shared with other government agencies¹ prior to release. The green paper did not contain any specific proposals, rather, it aimed to stimulate discussion on the topic to better understand the role of government in this space. The full list of consultation questions is included in **Appendix One**.

Consultation period

EECA released the green paper for public consultation between 8 August and 5 September. Submitters were asked to send written responses to the consultation questions or any other feedback to star@eeeca.govt.nz.

Information about the consultation process was communicated through EECA's website, social media channels and emails to EECA's EV charging stakeholder database.

¹ Ministry of Transport, Waka Kotahi (New Zealand Transport Agency), WorkSafe and the Commerce Commission

Overview of submissions

A total of 86 submissions were received. Full submissions are available to download [here](#). If you have any queries, please contact Star@eeca.govt.nz.

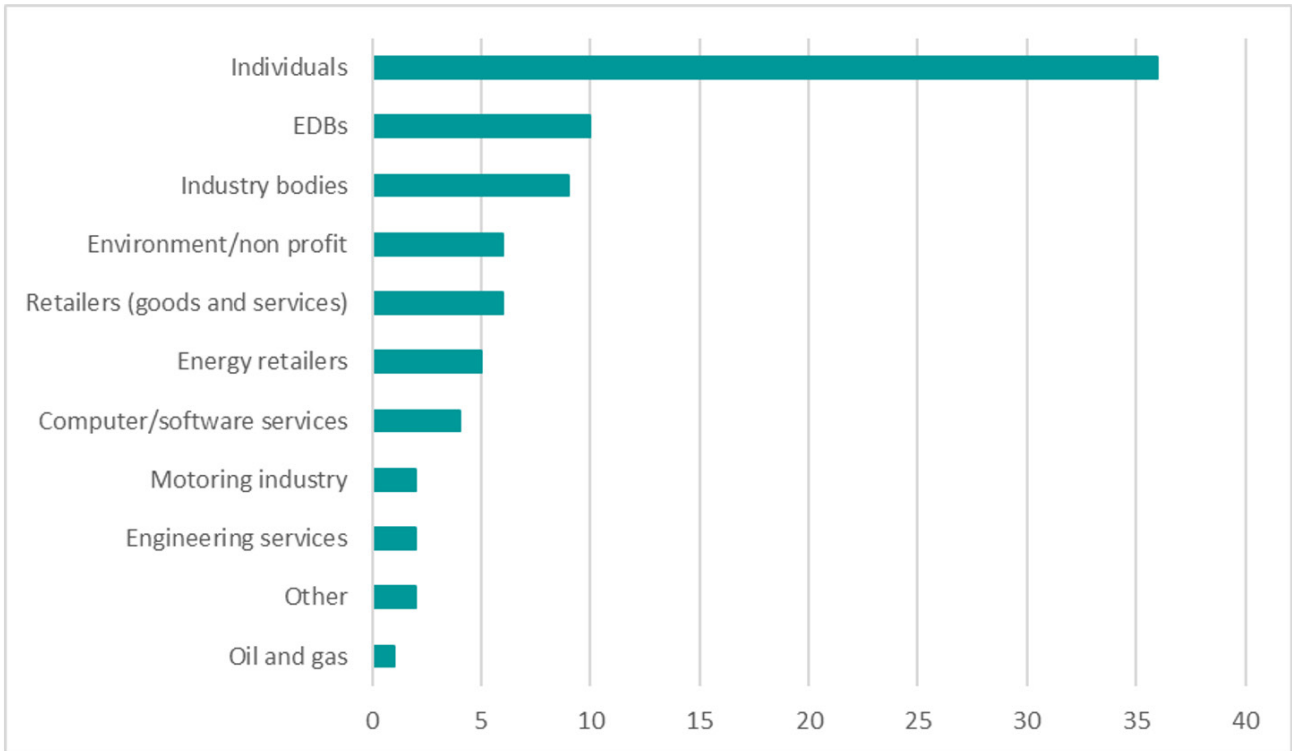


Figure 1: Breakdown of Submissions by category

The largest number of submissions were from individuals (36), followed by EDBs (10) and energy retailers (5). The figure below represents the distribution of EDBs who submitted on the Green Paper.

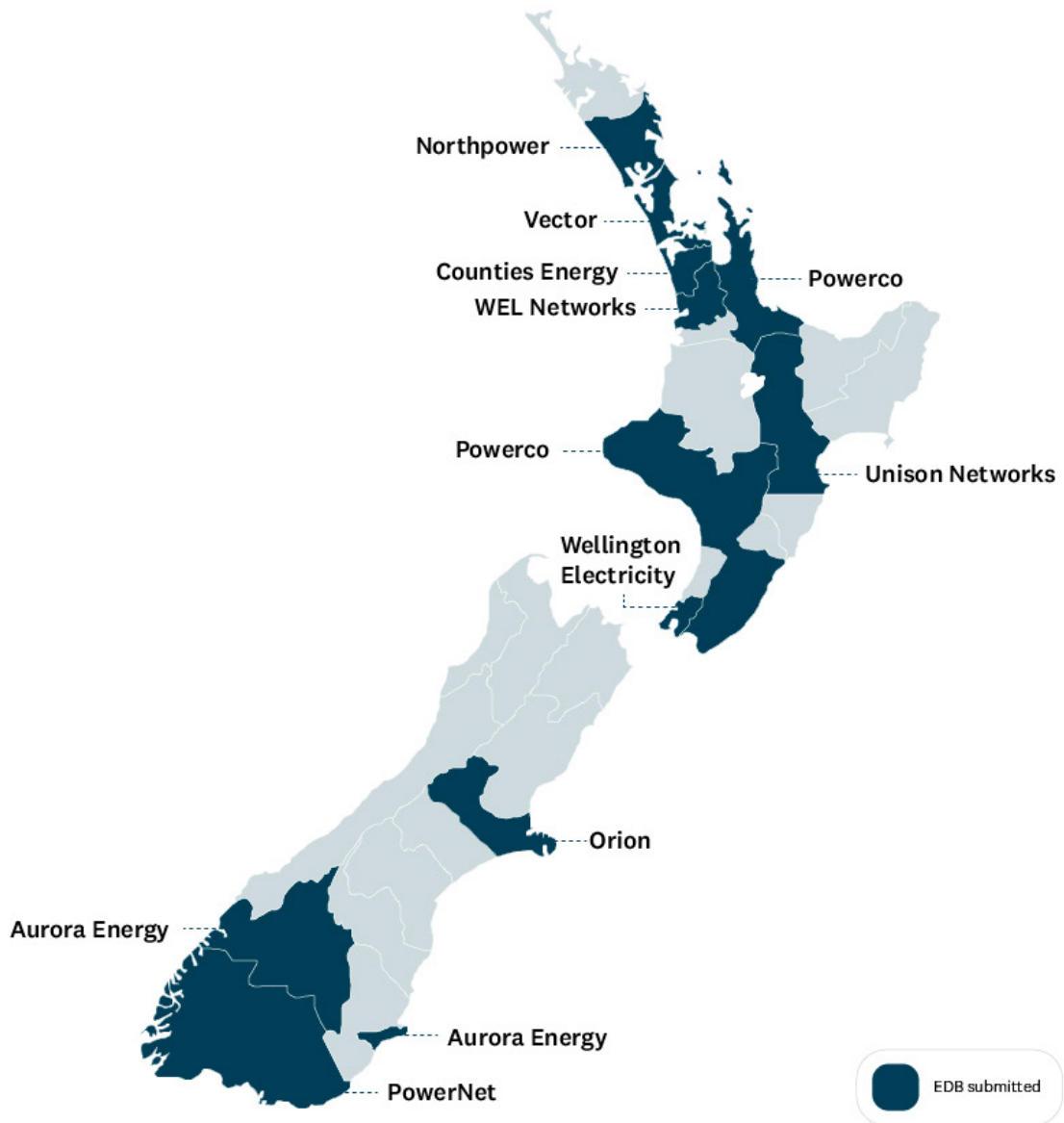


Figure 2: Distribution of EDB submitters

The retailers category represents those who sell energy equipment (such as meters) as well as those who sell other goods such as energy equipment (e.g solar and electric vehicle charging equipment) and other consumer goods.

The industry group category included those with interests in private EV charging, including those across the energy, housing and business sectors.

Overall themes and key messages

The majority of submitters endorsed the need to encourage the uptake of smart chargers

While EECA received a mix of responses about the best method for encouraging EV uptake, the vast majority of submitters, across all submitter categories, agreed that some form of intervention to accelerate smart chargers uptake is needed. Most submitters were highly supportive of EECA's engagement on the topic agreeing with EECA's commentary in the green paper about the importance of smart and energy-efficient chargers.

Some submitters, largely EDBs, have provided estimates on the impact of unmanaged and/or the use of 'dumb' chargers on the network, providing additional insights for EECA and the government to consider. For example, one EDB (Vector) estimated that unmanaged EV charging could increase peak demand experienced on the network by 150% with another EDB (WEL Networks) estimating that by 2040, significant additional infrastructure investment, equivalent to 1.3 times their current asset base, would be required.

Many submitters were also fully aware of the cost savings and wider economic benefits associated with the roll-out of smart-enabled technologies.

New Zealand should consider international contexts and case-studies

A common theme, across all commentary on the consultation questions, was the importance of leveraging international case studies. Submitters noted that many of the issues expressed in the Green Paper are being grappled with elsewhere, and New Zealand should not try to reinvent the wheel when trying to identify solutions. Understanding what has been done globally, and its potential for replicability in New Zealand is a critical first step in determining any suitable intervention to encourage smart charger uptake in New Zealand.

While the UK's approach (referred to in the green paper alongside other international examples) was referenced by many submitters. Submitters felt that there is a range of international case studies and standards that need further consideration/alignment with by New Zealand including in Europe, Australia, United States and Japan.

New Zealand must keep in step with evolving markets

Many submitters noted that the smart EV charging and wider Demand Response/Demand Flexibility (DR/DF) market is still developing globally and that any intervention (particularly for any proposal to introduce a set of smart charging standards) needs to be responsive to international developments. While a timely response to the issues outlined in the paper is needed, many submitters stressed the importance of reducing the likelihood of locking New Zealand out of new technologies and innovation occurring globally. This was reinforced by submitters noting that New Zealand should be encouraged to act as a fast follower with EV charging technologies.

Historically, New Zealand tends to be slower at adopting emerging technologies, so we need to ensure any intervention is designed to be adaptable to ensure New Zealand remains integrated with global markets.

Greater coordination in New Zealand's EV charging sector is needed

Many submitters gave reference to existing work programmes and forums within the private and public sector which are looking at issues, similar to those explored in the green paper, most notably the FlexForum and Are Ake. Submitters commented that cross-Government cooperation would be required to ensure compatible regulations across areas such as safety and energy use managed by different Government bodies. Any intervention, whether that be regulation, education or incentives needs to be designed and implemented collaboratively.

Other submitters felt that greater clarity of roles and responsibilities across Government and industry is needed. A few submissions suggested that a pathway or 'roadmap' for residential EV charging in New Zealand is also needed.

Finally, many submitters noted that EV chargers are just one part of the broader system of Distributed Energy Resources (DER), and any intervention actioned by EECA in this space must align with initiatives looking at supporting New Zealand's flexibility market. Supporting the development of flexibility markets to enable all types of DER, will provide the best outcome for New Zealand.

Overview of submissions by consultation question

Q1. What are your thoughts on EECA's suggested engagement principles for EV chargers?

What would you add or take away?

Is there anything you disagree with?

The green paper outlined a set of engagement principles to help guide EECA's approach to engaging with private EV charging. The vast majority of submitters across all categories agreed with EECA's proposed engagement principles. The themes submitters felt needed greater exploration/representation in the principles are detailed below:

Consumers need to be a central consideration in a smart charger rollout

A key area identified by submitters was the strong focus on network and Government benefits and what they felt to be a lack of consumer representation in the principles. Submitters felt that consumers need to be a central consideration for any intervention undertaken by Government in the EV charging space. Commentary on this topic broadly fell into three key themes:

Consumer buy-in

A number of submitters noted that consumer consent is critical to the effective roll-out of smart and energy-efficient chargers. Consumers need to understand how smart chargers can benefit them in the medium to long term, as most of the commentary is centred around the wider system benefits of smart charging. Providing consumers with clear messaging on the benefits and certainty of New Zealand's proposals for smart charging is key.

Consumer privacy

Another aspect that several submitters felt needed reflection in the principles is consumer privacy. A smart charging roll-out would lead to an increasing number of consumers making data available to allow them to participate in smart charging. Consumers need to understand what data of theirs is required when it will be used and by whom.

Consumer equity and achieving a just transition

Numerous submissions raised the importance of social equity and achieving a Just Transition. The impacts of unmanaged charging will impact all households, both those who own EVs and those who don't, however, the immediate, direct, individual benefits accrued from a smart charging roll-out may largely be felt more within high-income households. Submitters felt that greater consideration of all communities and demographics must be considered as part of any intervention to support smart charger uptake.

Greater consideration of EV charging developments and trends

Submitters felt that the principles needed to place greater consideration on future EV charging trends and developments. EV chargers are expected to have a long life span and it is highly likely the functionalities and services EV chargers can provide will grow significantly as the technology develops further. As detailed in the section above, submitters reiterated that any intervention made by government must leave the door open for potential innovation and/or optimisation services to ensure we can reap the benefits of these growing markets.

Although EECA's most recent data suggests the majority of charging occurs at home, over time, these trends may change as New Zealand's public charging network expands and fast EV charging becomes more prolific. EECA should consider these eventualities as part of any intervention.

Q2. What are your thoughts on the proposed specifications for 'smart' chargers in New Zealand?

What do you see as most and least important?

What functions would you add or exclude, if any, and why?

What information could you supply to EECA to help inform our thinking about this issue?

Basic functions could form the basis of a smart charger standard in New Zealand

In general, submitters felt that the basic functions are a good first step to defining smart chargers, as outlined in the paper². Although there were varying views on which basic functions they felt were more important than others, submitters noted the importance of setting a common set of functions and minimum standards as key if New Zealand is to realise the full benefit of smart chargers.

However, as noted in the section above, these specifications should be mandated in a way that enables them to be adjusted to remain up to date with global developments in EV charging standards. Some submitters also felt that any specifications for New Zealand should be based on international Standards, rather than being developed in New Zealand.

Strong support for Vehicle to Grid technologies

There was significant interest across submissions in support of Vehicle to Grid (V2G) and (V2H). Many submitters were in strong support of requiring smart chargers to have such functionalities and enable consumers to have an integrated home energy system. Submitters felt that the ability to facilitate excess generation back into the grid was important, and is a key mechanism for reducing demand on the grid.

² The ability to turn the charger on and off, and adjust the charge rate for each charger e.g. network operators reduce EV charging during peak demand and increase it at times of high electricity supply (off-peak periods)

Manual override of any functions is important

Some submitters also felt strongly about the importance of retaining consumers' ability to manually override any pre-set functions within smart EV chargers (i.e manually turn the charger back on after automatically being turned off due to heightened demand on the grid). At the same time, others felt that additional levers must be in place to ensure such ability does not create adverse effects. For example, if a large weather event is forecasted prompting individuals to all charge at the same time.

Further commentary from one EDB expressed that in a UK study of 750 motorists, 9 out of 10 agreed that this auto function is important, however, over trials with over 1000 consumers, it was only used for 16% of charging sessions (Orion submission), showing that these functions are rarely actually used.

Q3. Do you support EV charging being open access, and why/why not?

What information could you supply to EECA to help inform our thinking about this issue?

Do you think that 'smart' chargers should address issues of cyber security?

How would you suggest this is done?

The majority of respondents supported open-access EV charging. The importance of cyber security was noted by several respondents, as was the importance of open access as a solution for demand flexibility.

Open access was supported as submitters noted it allows operators to attain data to effectively manage the network without being locked into using one operator forever. Some submitters noted that open access is the key function needed, as this provides the means to implement randomised delays, default off-peak charging and reduced charging at peak load while still allowing consumers to move between providers/operators as they choose. Open-access enables operators to use mandated controls like the above, reducing electricity demand on the grid and protecting the consumers' electrical supply (e.g automatic turn off when the voltage reaches below a certain threshold and restores when the voltage recovers).

Others felt that other aspects such as cyber security and mechanisms to protect the charger in case of a power outage should also be included. Submitters also suggested mechanisms to protect cyber security including the introduction of an authorisation process for EV management and introducing of cyber security Standards and certificates.

Q4. What are your thoughts on EV chargers having to transmit information on their location and use, and the suggested scope of information to be provided?

Who should be able to access this information?

In what form should it be transmitted?

What processes should be in place to safeguard the data?

Is there any other way this data might be captured?

Most submitters agreed with the importance of understanding where EV chargers are located and connected to the network. This enables EDBs to map where demand is coming from to effectively undertake network planning and management.

Utilising ICPs at the time of installation

A key way to do this is by linking the charger with an Installation Control Point (ICP) at the time of installation. There are existing processes in place for registering ICPs for other devices and a similar approach could be adopted for EV chargers. At present, the Electricity Industry Participation Code 2010 requires the consumer to register the installation, however, one submitter recommended that this be placed on the person who installs the charger, rather than the consumer. EECA will pass this feedback on to the Electricity Authority for consideration.

The UK has a qualified installer programme, which enables individuals to become qualified installers of smart charge points to support their regulatory regime on smart chargers. This scheme helps to ensure all charge points are registered at the time of installation, enabling location data to be obtained efficiently.

Consumer privacy is a key consideration

The privacy of individuals data was frequently mentioned, stressing that this data should only be shared between the consumer, network operator and/or any party involved, and protocols must be in place to ensure consumers have comfort that their data is protected and should be limited to those who need to see it.

Smart chargers could hold the same functions as smart meters

Some submitters envisaged that EV chargers will hold similar functions to smart meters, particularly as Multiple Trader Relationships (MTRs) are established. At the same time, other submitters felt that it could also add additional complexities and costs for consumers should MTRs be placed in a Standard at this stage. A few submitters raised the Peer to Peer/MTR work programme underway by Ara Ake, which could be used to inform future smart charging Standards in New Zealand.

Q5. What are your thoughts on a requirement for EV chargers to monitor and record electricity consumed and/or exported during EV charging, and for this information to be made available to the EV owner?

What other information may be valuable to the EV owner?

What format should be used for this information if this requirement is adopted?

Many submitters saw value in having this information available to EV owners, as it could help EV owners understand their charging habits and usage patterns better. This was backed by one EDB which found that this function is highly utilised by their customers with EVs.

It was suggested this could function in a similar way to smart meters but with the added benefit of using open access protocols, meaning consumers can switch between providers and still benefit from access to their data.

Some submitters noted that such functionality, and the ability to provide this data in a way that makes sense to consumers, is still in its early days, so it's important that such function could evolve with developments in the EV charging technology and supporting software.

Q6. What are your thoughts on requiring mandated power quality and control settings for EV chargers?

Most submitters were in support of this function, particularly as it can help to reduce the load produced from EV charging on the grid, particularly during emergency grid situations or unplanned events. This will ensure consumers can maintain a stable electricity supply while protecting the performance of the consumers' equipment.

Some submitters noted that they already utilise this function through other devices in their homes (Solar photovoltaic/Battery system), and support extending this to EV chargers.

A few submitters suggested that the Australia/New Zealand Joint Standard AS/NZS 4777.2:2020 Grid connection of energy systems via inverters, Part 2: Inverter requirements for grid connection inverters could be extended for EV chargers. Another submitter noted that requirements for volt watt control are currently missing from SNZ PAS 6011:2021 Electric vehicle (EV) chargers for residential use and that the publicly available specification (PAS) would need to be amended should this function form part of smart EV charging guidance for New Zealand.

On the other hand, one submitter noted that mandating any control settings could also affect when consumers use their EVs and restrict their choices around charging technologies. This could have a perverse outcome and steer consumers away from smart chargers if they saw more value in maintaining full control than benefiting from the opportunity to reduce their electricity consumption through DR/DF.

Another submitter queried the equity of mandating such a function, as this places restoring grid voltage issues largely on consumers charging their vehicles. Other people using large amounts of power through activities would not have the same responsibilities.

Q7. What are your thoughts on regulating the energy efficiency of onboard EV chargers?

What information could you supply to EECA to inform this issue?

What challenges, if any, do you see in regulating this area?

While some submitters felt that this was necessary, most submitters felt that, at this stage, regulating the energy efficiency of onboard chargers was unnecessary or premature. Submitters provided a range of reasons for this including:

- a. The introduction of mandatory energy efficiency standards could exacerbate the issue of high up-front costs,
- b. The small size of the New Zealand market could steer EV manufacturers away from us, restricting the choice and availability of chargers in New Zealand,
- c. New Zealand's understanding of the topic is low, and further consideration of international Standards or recognised test methodologies is needed ahead of any move to regulate, and
- d. The lack of evidence suggests that vehicle manufacturers are offering New Zealand less efficient onboard chargers as opposed to overseas markets.

Instead, many submitters suggested introducing a star-rating system for consumers to understand the energy efficiency of their chargers, rather than mandating them. Many individual submissions who are EV owners noted that they are unaware of the efficiency of their onboard chargers, and what this means for the distance they can travel.

Q9. What are your thoughts on whether charging cables which contain a 'smart' charging enabling device should be in scope for intervention?

EECA received a mix of responses to this question. Some submitters felt that the power capacity of these cables is too low to make any difference in alleviating demand on the grid and that these cables are not designed to charge vehicles for extended periods.

At the same time, other submitters felt that all charging cables need to be included to maximise the benefits accrued from smart charging and participation in the wider flexibility system. One submitter noted that the UK's regulations include specifications for 'smart' cables and exclude any for non-smart enabled cables, suggesting New Zealand could follow this same approach.

Furthermore, many submitters noted that three-pin cables are still widely used by consumers either for convenience reasons, unawareness or disinterest in alternative charging methods or belief that the cable provides the utility they require. At a more basic level, it was suggested that education for consumers on the difference between three-pin cables and other chargers and how to use charging cables safely is important, as evidenced by SNZ PAS 6011:2021.

Many submitters believe that regardless of the development of the smart charging market, charging cables will remain prevalent in New Zealand's charging mix, thus there may be a separate role for the government in encouraging better charging habits for charging cables.

Q10. What are your thoughts on the 'do nothing' option for EV chargers in New Zealand?

Do you think the market can adequately address this issue without the need for government intervention?

What information could you provide to EECA to inform this issue?

The vast majority of submitters did not support the 'do nothing' option for New Zealand and felt that some form of intervention is needed to safeguard our electricity system and realise the full benefits of a functioning DR/DF market.

Some submitters felt that the current market is too small to provide solutions in the time required because the current incentives offered to consumers to change their charging habits are simply not strong enough to shift behaviours and/or encourage the use of smart chargers.

“The relative risks between ‘do nothing’ and making an intervention are drastically asymmetric. The downside of regulating – potentially a modest increase in the price of EV charging units – is vastly outweighed by the missed opportunity of a more efficient and effective electricity system, which in turn will help to limit increases in the price of electricity to consumers.”

Submission from the Northern Energy Group

This small size of the market, according to some submitters also presents the opportunity for New Zealand to develop an effective and efficient home charging network. Without timely intervention, consumers would continue to install ‘dumb’ chargers which cannot leverage demand response services and may become unsupported in the medium to long term, leading to additional costs for consumers.

This approach could lead to an inconsistency in charging functions amongst consumers, locking consumers out of emerging technologies. A lack of interoperability may also lock consumers into a single provider.

Others felt that while the ‘do nothing’ approach is not preferred, imposing strict regulations on EV chargers is not preferred either, and may pick winners in the technology sector.

Some submitters did prefer the ‘do nothing’ option for New Zealand. This was predominantly due to the following reasons:

- a. The global EV charging market is still premature, and the growth of the market and associated innovation will provide New Zealand with better chargers for lower prices, providing sufficient signals for consumers to opt for smart chargers, and/or
- b. Time-of-use tariffs offered by retailers will provide enough incentive to encourage consumers to charge off-peak, reducing load on the grid and allow consumers to see for themselves the benefits of smart chargers.

Q11. What are your thoughts on the likely effectiveness of information, education and labelling to improve the uptake of ‘smart’ EV chargers?

What information could you provide to support your position?

The majority of submitters were in favour of using information and education to encourage the uptake of EV chargers, largely because it would help EV owners make more informed decisions about their purchases.

Education could be focussed on both the benefits and functionalities of smart chargers as well as the financial benefits of shifting any type of charging to off-peak times. Submitters also noted the importance of having this information in plain English and useful to consumers. One submitter noted that this is something that EECA should lead on and suggested using the Gen Less platform as a means to do so.

As noted in the submissions on Question 9, there is also an opportunity to use education to encourage better charging habits. After all, as outlined by a few submitters, 3-pin charging cables will continue to be used so supporting knowledge sharing on safe charging or using timers for off-peak charging is important. This is particularly relevant for people who may be renting and/or living in shared housing situations.

However, some felt that education needs to be rolled out in combination with other measures. Others felt that the effect of information and education is limited and that economic or regulatory factors (such as price) are more likely to override consumer awareness. Furthermore, the benefits of education campaigns may be difficult to quantify, resulting in a low cost-benefit ratio. Even if individuals are presented with the long-term savings associated with owning a smart charger, these may not be sufficient in increasing uptake, particularly as there is no immediate benefit to consumers.

Q12. What are your thoughts on the use of incentives to encourage the uptake of ‘smart’ EV chargers?

What incentives do you think would be effective and who should provide these?

What other incentives might be valuable beyond financial incentives?

Incentives in various forms were popular amongst submitters across all categories, who felt that they were effective at encouraging off-peak charging and shifting charging habits. Commentary on this consultation question fell into the following themes.

Incentives for off-peak charging

There are off-peak charging plans available from energy retailers, with many individual submitters noting that these are encouraging them to coincide charging periods with when discounted rates are offered, or charge exclusively during off-peak periods, saving around 25% on their energy bills. This was backed by other submissions from environment/non-for-profits who have heard that incentives have effectively encouraged their members to change their charging habits. One submitter noted that ongoing incentives like the above prove to be more effective than one-off incentives³.

At the same time, pricing signals may not reflect the full future value of flexibility, having set off-peak pricing signals does not accurately reflect periods of network congestion, as these usually occur during weather events that are more difficult to forecast. Managing peak load is only needed when these events occur.

Incentives to support smart charger installation

A number of submissions were in support of subsidies or rebates to support the installation of smart chargers. Submitters noted that the upfront cost will continue to be the largest barrier to smart charger uptake, given that there is no upfront benefit for consumers but is distributed across the general public and network.

Many submitters noted price ranges from between \$1000 and \$3000NZD, and a subsidy scheme and/or rebate for smart chargers could support uptake. One smart charging supplier noted that the cost of installation by a qualified electrician represents between 40 to 50% of the total cost of a smart charger. This could lead to consumers attempting to install chargers themselves, which presents safety risks. One submitter also felt that direct subsidies would provide the best cost-benefit ratio for investment.

However, a few submitters suggested that any incentives for smart chargers are not a long-term solution, rather, they should be used as an interim solution either to ensure effective public spending and/or allow time for the market to develop. This was the case in the UK, where incentives were offered for three years driving adoption to between 70 and 100%, where, over that time, the industry was able to develop to ensure charger installation was no longer prohibitive.

Some submitters felt that incentives would need to be multifaceted (for example, smart charger subsidies and off-peak charging plans), while others felt that incentives would be inadequate to create the change needed, even in conjunction with other measures.

³ https://innovation.ukpowernetworks.co.uk/wp-content/uploads/2022/06/UKPN_Project-Shift_2022_Web-PDF-v2.pdf

We received a mix of responses concerning who is best placed to provide incentives. Some submitters believed that incentives should be industry-led, with many noting that electricity retailers are already offering incentives (such as those outlined above) with a few submitters endorsing government-led incentives, which could be funded via revenue from the Emissions Trading Scheme. Some submitters referred to other funding programmes administered by EECA (such as the former Warm Up New Zealand programme⁴ which provided heat-pump subsidies) and felt the same model could be followed. Another suitable incentive delivery entity could be Waka Kotahi.

Others were not supportive of incentives due to equity grounds. For instance, some submitters felt the introduction of subsidies in the near term could solely benefit current EV owners and that this demographic tends to feature high-income households.

Q13. What are your thoughts on regulating the ‘smartness’ of EV chargers in New Zealand?

What do you think of New Zealand adopting the approach being undertaken in the UK?

What information could you provide to support your position?

The proposal to regulate the smartness of EV chargers received a positive response with three-quarters of respondents in favour. Much of the rationale for supporting regulation was in line with responses that did not support the ‘do nothing’ option in Question 10, with many submitters in support of the UK’s approach. A portion of submitters felt that the risks to the system were far too great, and that regulation is the only mechanism strong enough to make a difference.

Submitters felt that should the Government move forward with regulation, there would need to be a strong lead in time, and a clear division of roles and responsibilities (between charge point operators, EDBs and Government) would need to be established. Some submitters believe that any move to regulate would also require an education element to ensure consumers have clear and simple messaging to understand what smart chargers and regulation mean for them. This would include a clear timeline for regulation and what that would mean for charger prices.

Some submitters felt that a balance would need to be achieved whereby New Zealand introduces minimum standards to ensure both the grid and consumers benefit from smart charging and be implemented in a way that ensures those standards can evolve in line with the developing EV charging market and innovation.

⁴ Now the Warmer Kiwi Homes programme (<https://www.eeca.govt.nz/co-funding/insulation-and-heater-grants/warmer-kiwi-homes-programme/>).

Conversely, some submitters felt that there would be an inappropriate risk of market-lock out should New Zealand introduce any regulation for EV chargers in the near term. Others felt that regulation could have potential perverse outcomes, steer people away from using smart chargers and increase the use of inefficient charging cables. One submitter, for example, noted that regulation could fuel the argument that the grid cannot support EVs, driving individuals away from purchasing an EV altogether.

Q14. What are your thoughts on using the PAS for residential EV chargers to underpin regulation/incentives?

What parts would you exclude or change?

Does the PAS cover all the important issues?

What other resources may be useful for New Zealand?

Most submitters supported using the PAS to underpin regulation, in principle. Submitters also noted that the implementation would need to be developed in a way that would enable it to be reviewed and updated as the wider EV charging market and New Zealand's demand response market develops. The PAS would also need to be updated to reflect the functionalities detailed in Question 2.

As emphasised in previous questions, this was a key question where submitters felt New Zealand should leverage international examples. This includes a British Standard Institution Standard being deployed in the UK and AS/NZS 4777.2:2020 Grid connection of energy systems via inverters, Part 2: Inverter requirements. Submitters suggested New Zealand should work with other countries to develop our Standards based on their experience with the above.

It was felt that the PAS, in its current form, maybe too technical or in-depth. Some submitters were unfamiliar with the PAS and did not comment on this question.

Q15. In what other ways might the energy performance of EV charging in New Zealand be improved, that do not require EECA's involvement?

Many submitters used this question as an opportunity to summarise their key points made as part of earlier questions.

The importance of time-of-use charging incentives was reiterated here, with many submitters believing it is the key way to shifting grid load, and the Government's role could be best spent looking at power pricing and its relation to grid loads and supporting EDBs with off-peak pricing plans. Furthermore, the cost and limited benefits are too little incentive for consumers to switch to smart chargers. EECA will pass this feedback on to the Electricity Authority for consideration.

Submitters noted here that there are many other Government bodies (namely the Commerce Commission and Electricity Authority) with a strong interest in this space as well as many industry groups (i.e Flex Forum, OpenADR project) who have strong interests in this topic. Furthermore, there are existing schemes and work programmes in place that need to be considered as part of any solution or at least understand the linkages (such as the Clean Car Discount, the development of the National EV Charging Infrastructure Strategy and the New Zealand Energy Strategy).

Other matters raised as part of the consultation process

Smart functionalities within EVs

A few submitters, largely individuals who own EVs, mentioned that many EVs have smart capabilities within their vehicles already, reducing the need to own and/or mandate smart chargers and functionalities.

A few submitters referenced Nissan Leafs and the Tesla Model 3 and explained that both models have smart functionalities built into the cars' software that can be controlled by the consumer via an app. These functionalities include settings for the vehicle to be charged by a certain time or pre-set a time for the vehicle to stop charging but may not meet the proposed definition of 'smart' having a common set of functions and means of communication, such as OCPP 1.6, that can be used by any potential operators of the device.

Some submitters felt that utilising existing functions, including those mentioned above, could achieve the same outcomes sought through the adoption of smart chargers at a lower cost to Government and are not inclined to purchase a smart charger. This should be considered alongside any intervention as set out in the green paper. Submitters suggested that the push for a smart charging rollout may be less critical given the functions already offered in some EVs on the market today.

Apartment buildings and shared living arrangements

Submitters noted that intervention may need to consider shared living arrangements, as opposed to single-occupied homes.

Submitters felt this was important, particularly as we move to more condensed living arrangements which could facilitate EV charging for a larger number of homes. One submission noted that body corporates also have the authority to mandate smart EV chargers in their buildings if directed by Government. In addition, the Government would also only have to deal with one entity to capture these households enabling a more efficient smart charger rollout.

Any intervention taken would require provisions that cater to the needs of shared living situations. Interventions would be needed not only for the charger itself but also for the building/complex the charger(s) would be situated in, as appropriate infrastructure would need to be placed to enable EV charger installs.

Renting households are also a factor that needs consideration. One submitter noted that around one-third of kiwis are renting and would, much like those living in shared living situations noted above, require permission for any upgrades to properties required to support smart EV charging. Landlords, unless required to, would have little incentive to install a smart charger, particularly because the benefits will be received by the tenants (such as reduced electricity costs) while they are faced with the up-front cost of installing one.

Public and workplace charging

Increasing the availability of public chargers may drive more individuals to use public charging, reducing the need for private charger-specific interventions. One submitter from the motor industry noted that the National Policy Statement on Urban Development 2020 no longer requires developers to provide car parks which could increase the reliance on charging options outside of the home.

Network peaks for business districts are typically during work hours, and using flexibility services to manage charging during these periods could unlock further benefits for grid operators. It would also reduce complexities for both Government and the consumer in terms of defining the different types of chargers, and the subsequent rules that do and do not apply to them.

Conclusion

EECA would like to thank all submitters for the time and effort put into their submissions. The depth and quality of the submissions demonstrate a high level of interest in the topic. EECA will ensure each submission is taken into account when determining the next steps for EECA in this space.

Full submissions are available to download [here](#). If you have any queries, please contact Star@eeeca.govt.nz.

Appendix one: Consultation questions

1. What are your thoughts on EECA's suggested engagement principles for EV chargers?
 - What would you add or take away?
 - Is there anything you disagree with?
2. What are your thoughts on the proposed specifications for 'smart' chargers in New Zealand?
 - What do you see as most and least important?
 - What functions would you add or exclude, if any, why?
 - What information could you supply to EECA to help inform our thinking about this issue?
3. Do you support EV charging being open access and why/why not?
 - What information could you supply to EECA to help inform our thinking about this issue?
 - Do you think that 'smart' chargers should address issues of cyber security?
 - How would you suggest this is done?
4. What are your thoughts on EV chargers having to transmit information on their location and use, and the suggested scope of information to be provided?
 - Who should be able to access this information?
 - In what form should it be transmitted?
 - What processes should be in place to safeguard the data?
 - Is there any other way this data might be captured?
5. What are your thoughts on a requirement for EV chargers to monitor and record electricity consumed and/or exported during EV charging, and for this information to be made available to the EV owner?
 - What other information may be valuable to the EV owner?
 - What format should be used for this information if this requirement is adopted?
6. What are your thoughts on requiring mandated power quality and control settings for EV chargers?

7. What are your thoughts on regulating the energy efficiency of onboard EV chargers?
 - What information could you supply to EECA to inform this issue?
 - What challenges, if any, do you see in regulating in this area?
8. What are your thoughts on labelling aftermarket AC EV chargers?
9. What are your thoughts on whether charging cables which contain a 'smart' charging-enabling device should be in scope for intervention?
10. What are your thoughts on the 'do nothing' option for EV chargers in New Zealand?
 - Do you think the market can adequately address this issue without the need for government intervention?
 - What information could you provide to EECA to inform this issue?
11. What are your thoughts on the likely effectiveness of information, education and labelling to improve the uptake of 'smart' EV chargers?
 - What information could you provide to support your position?
12. What are your thoughts on the use of incentives to encourage the uptake of 'smart' EV chargers?
 - What incentives do you think would be effective and who should provide these?
 - What other incentives might be valuable beyond financial incentives?
13. What are your thoughts on regulating the 'smartness' of EV chargers in New Zealand?
 - What do you think of New Zealand adopting the approach being undertaken in the UK?
 - What information could you provide to support your position?
14. What are your thoughts on using the PAS for residential EV chargers to underpin regulation/ incentives?
 - What parts would you exclude or change?
 - Does the PAS cover all the important issues?
 - What other resources may be useful for New Zealand?
15. In what other ways might the energy performance of EV charging in New Zealand be improved, that do not require EECA's involvement?

Appendix two: Submissions on the green paper

Full submissions are available to download [here](#). If you have any queries, please contact Star@eeca.govt.nz.