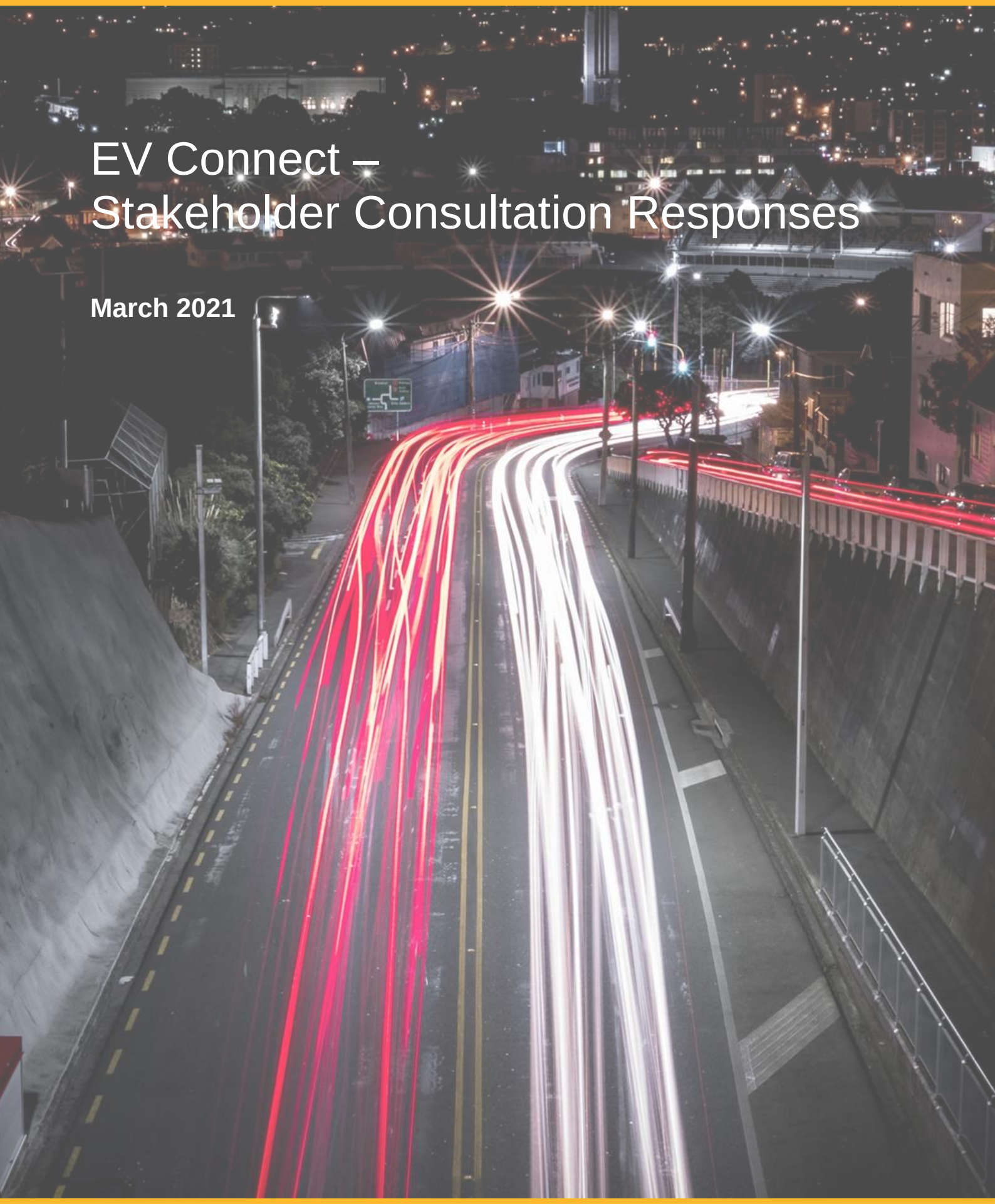
wellington electricity



EV Connect – Stakeholder Consultation Responses

March 2021

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GreenSync

Contents

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1 EV Connect consultation overview

Our EV Connect project and industry consultation opens the conversation to engage consumers about how we, together, can deliver more energy through the existing network. The purpose of doing this is to support Electric Vehicle (EV) adoption while maintaining network security. This will provide benefits across the electricity supply chain, for all consumers. To deliver a high level of service at a reduced cost to consumers – we think – will require greater coordination and collaboration across the electricity supply chain.

Wellington Electricity Lines Limited (WELL) has support from the Energy Efficiency and Conservation Authority (EECA) for the EV Connect Project. The project is enabling us to garner insights, test pilot technologies and identify options to continue to equitably support EV-owning customers and non-EV-owning customers in our network.

Recognising the value of this conversation with stakeholders, we incorporated a consultation phase into the EV Connect project during 2020. Consultation input and engagement with stakeholders also informs the final output from the project - a 'Roadmap' on how to further enable the uptake and accommodation of increased EVs and EV charging infrastructure in New Zealand.

While attention is specifically on EVs under this project, there are clear implications and relevance to wider categories of distributed energy resources (DER) like solar PV, batteries, hot water systems and other appliances. This was brought strongly to light through consultations with stakeholders who often noted that an initiative or approach that could apply to EVs or EV charging assets could also extend to or from arrangements for other types of DER.

During the consultation phase, we released a paper, held a workshop and received stakeholder feedback between October and December 2020. Our EV Connect paper can be found on our website at: https://www.welectricity.co.nz/about-us/major-projects/ev-connect/. Through these activities, questions were posed around 6 key themes:

- International policy context as relevant to EVs in New Zealand
- Network operational needs, connection policies, tariffs, incentives
- Opportunities to enable a national EV Registry
- Dynamic Connection Agreements
- Network and policy approaches to EV standards and protocols
- NZ market and regulatory structures

This document summarises the feedback from stakeholders throughout this period.

2 Stakeholders, consultations and feedback

Feedback was gathered via a half day workshop with 50 stakeholders held on 20 October 2020 from these organisations and via 13 written submissions received following the workshop:

- Aurora Energy
- Orion
- Vector

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- Unison Networks
- Electra
- Powerco
- Network Tasman
- Meridian
- Flick
- Independent Electrical Generators Association
- Major Energy Users Group
- Drive Electric
- Our Energy
- Ministry of Business, Innovation and Employment
- Transpower
- Electricity Authority
- Electricity Engineers Association
- Electricity Networks Association
- Commerce Commission
- New Zealand Transport Authority
- Energy Safety
- Energy Efficiency & Conservation Authority

As the areas of focus and comments in the submissions and feedback from participants in the workshop overlapped, we have summarised both in the following three sections.

3 Stakeholder consensus

The following areas saw the majority of stakeholders in agreement. We've noted the area in bold, the organisations who explicitly supported and provided summarised and selected narrative from the submissions and comments received at the workshop. These areas provide clear themes and direction that we can use to build the next steps – the EV Connect Roadmap.

National, strong leadership is needed to develop strategies; coordinate input from regulation and policy makers and industry; develop regulation, commercial, technical frameworks.

- Supported by Aurora Energy, Orion, Our Energy, Independent Electricity Generators Association, Unison Networks, Electra, Network Tasman.

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- The majority of stakeholders were aligned around issues of national leadership and coordination on the approach to EVs. Comments on coordination and leadership included that:
    - the Electricity Authority, the joint EA/Commerce Commission workstream on emerging tech should be involved in leading and developing these strategies
    - further work should recognise and incorporate existing work streams such as the Distribution Network Pricing Group work on cost-reflective pricing; the Electricity Authority's Innovation and Participation Advisory Group (IPAG) and Market Development Advisory Group (MDAG); Concept Consulting's work stream on policy choice to support EV uptake and the ENA Network Transformation Roadmap.
- New Zealand decision-makers need to improve how they involve consumer representatives and the technology sector
- EVs should not be looked at in isolation – WELL/New Zealand needs to take a technology agonistic approach as other technology may also become significant users of demand
- there is a critical role for consumer awareness and education in relation to options and services that are evolving from increased uptake of EVs
- the role of installers/product resellers in engaging with (and educating) customers should be addressed in any change and rollout/implementation of initiatives.
- Several stakeholders noted that a regulatory support framework is needed to address safety; security; reliability; economic efficiency; customer outcomes; and sustainability/environment. Such a regulatory support framework for EVs could/should be developed that addresses:
    - distributed generation connection processes being extended to EVs/EV chargers over a certain size
    - network planning arrangements
    - peak demand, demand response and charging interactions (especially for large chargers)
    - fleet management and multiple EV charging locations
- There may be a role for a 'regulatory sand-box' to enable market-based trials (at scale) to inform regulation, pricing and policy development. Similar approaches have been adopted in the UK (2017)[1] and Australia (2019)[2].

National EVs and EV chargers data registry and data sharing is a good idea.

- Supported by Aurora Energy, Orion, Vector, Electra, Powerco, Drive Electric, Network Tasman

[1] Now updated to the Innovation Sandbox Service. For further info see: https://www.ofgem.gov.uk/publications-and-updates/innovation-sandbox-service-overview
[2] Australia is still in the process of implementation, but background and general information can be found here: https://www.aemc.gov.au/market-reviews-advice/electricity-network-economic-regulatory-framework-review-2019

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- Stakeholders were generally supportive of the idea to develop a national EV registry but diverged on the implementation and extent to which this might be done in the near-term. Most stakeholders agreed that such a register is essential to understand the location of EV chargers and charger capacity. Identifying which entity does this is an important step.
- Several stakeholders noted that there may need to be a threshold applied for capture of EV chargers of ≥7kW or mode 3 and 4 for charging units.
- A number of stakeholders also said that more work is needed to determine the most efficient way to implement this. One stakeholder noted that such a database may exist, so implementation could include expanding on/leverage this.

Dynamic Connection Agreements (DCAs) that enable dynamic management of EV chargers and/or other distributed energy resources are a good idea.

- Supported by Aurora Energy, Orion, Our Energy, Meridian, MEUG, Vector, Unison Networks, Electra, Powerco, Drive Electric
- Stakeholders supported further development of dynamic connection agreements (DCAs) for EV charging with some emphasising the need to ensure customers are free to choose whether they apply a DCA. Additional commentary on this theme included:
    - we should not make assumptions about consumer preferences, and willingness to provide management rights to a third party
    - we need to understand what consumers want and what the managed parameters would need to work within such as:
    - when immediate charging is needed; or
    - when a trip is coming up and charging can/will be scheduled.

Standard protocols for EV technologies – Open Charge Point Protocol (OCPP) is a good idea.

- Supported by Aurora Energy, Orion, Our Energy, MEUG, Vector, Electra, Powerco, Drive Electric
- Stakeholders largely agreed that there should be a consistent national approach to EV standards and protocols. However, some cautioned that given the rapid rate of change and technology advancements, care must be taken in prescribing a specific protocol. A number of stakeholders suggested that this is an area where regulatory leadership could drive a consistent approach. Others noted that regulators should step in if industry consensus is not found.
- A number of stakeholders emphasised that EV charging technologies should have the same notification requirements and device-level performance standards as distributed generation assets. Changes coming to AS/NZS 4777.2:2020 is expected to include specifications for vehicle to home (V2H) and vehicle to grid (V2G).
- In general, stakeholders noted that services from EVs and EV charges could provide significant resilience and reliability benefits for consumers and networks.
- Several stakeholders noted that OCPP is becoming the global de-facto standard. Emphasising support/preference for it in New Zealand would provide a baseline upon which

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individual OEM's can then overlay premium or proprietary protocols. Several Electricity Distribution Business (EDB's) have already built commercial products using this standard. A formal agreement by all EDB's and charger OEM's to adopt OCPP may be a useful first step.

- One stakeholder noted that as long as a third party can interact with the network and the DER, it may not be necessary to mandate protocols – or they could be limited. Mandated standards in other places have been unutilised or superseded by alternatives, so real care is needed when 'adopting' a standard.
- Another stakeholder noted that EDBs should probably be indifferent to specific technologies, as long as they meet minimum technical functionality and communication protocols. Inter-operability should become a required/minimum feature of any service or device, going forward.
- A number of stakeholders thought the decisions should aim for 'least-regrets' approach to protocols. In this context, a platform which communicates with different systems via 'bridges' – as per the approach of WELL's EV Connect project partner, GreenSync – appears sensible. Avoiding the potential for costly retro-fits, or non-availability of some smart chargers to a demand management system.
- To progress discussion, a technical working group could/should consider issues including:
    - whether the rules are optional (with pricing incentives) or compulsory
    - forecasting the need (and network demand)
    - establishing who will be responsible for managing and enforcing technology standards
    - when standards should be introduced, noting that we don't want to bring in restrictions after customers make an investment
    - a process/pathway to keep up with technology changes (maintain flexibility in any related rules).

Low voltage visibility and monitoring of EV (or other DER) is a good idea.

- This was supported by Vector, Meridian, Orion, Aurora Energy, Electra, Powerco
- Stakeholders generally agreed that this is a good idea. The general comments we received emphasised the importance of networks having visibility of EVs, and other DER, because this information helps them to ensure the reliability of the network.

Network tariffs/incentives (or a package of both) can be used to influence customer behaviour.

- This idea was endorsed by Orion, Flick Electric, Electra
- Other stakeholders noted that influencing customer behaviour is not only driven by these elements. Several pointed, also, to the vital role of education, awareness, communication and product/technology capabilities (i.e. automation) in influencing customer behaviour.

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- On specific tariff structures, some stakeholders pointed out that time-of-use (ToU) arrangements may not be the best pricing method and pointed to alternative cost-reflective price signals as a potential avenue for better signals. Others noted that:
    - tariffs need to be easy to use
    - more needs to be known around what customers value and how customers prefer to manage that value
    - real time use will help customer engagement – making a person's interaction more meaningful because they can see the impact immediately.
- One group of stakeholders noted that in order to answer this fully, further trials will be required to establish and meet the needs of consumers, building on the above comment about 'more needs to be known' around what customers value and prefer.

Responsibility for network quality of supply should remain with distribution businesses, but there is (also) a role for the market to help enable and facilitate.

- Supported by Aurora, Orion, Unison, Electra, Network Tasman
- Among distribution businesses, agreement was consistent on the need to ensure responsibility for network quality of supply remains with them but also that future market structures include a path for them to purchase services to assist in doing so.
- Several stakeholders noted that contestable (market) services should be over-ruled where there is a physical network impact. Relatedly, stakeholders noted that clear and enforceable network standards will be essential in ensuring that the operation of DER does not have negative consequences for network quality and reliability.
- A number of stakeholders noted that the regulatory framework should better enable distribution businesses to purchase services or offer prices for assistance in managing quality of supply.
- Looking outside the box of this idea, one stakeholder noted that there are other (existing tools) available to maintain a stable network:
    - education
    - pricing (tariffs/incentives)
    - maintaining hot water "ripple" control – an important foil to EV charging – or offering managed charging to other appliances

A coordinated approach is needed on New Zealand's energy market structures and market reform

- Supported by Aurora, Orion, Our Energy, Meridian, Vector, IEGA, Unison, Electra, Drive Electric
- Stakeholders agreed that there needs to be a clear designation for governance over the development and coordination of work on market structures. However, views on what should be included within a coordinated approach differed.

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- Ideas and suggestions on what might be pursued / coordinated was broad and varied and included:
    - the focus needs to be oriented to what's desired by and is best for the customer
    - development needs to be led by a central regulator/facilitator who identifies rules/frameworks to best utilise energy market assets
    - collaboration that includes car manufacturers, consumers, 3rd party charging providers and aggregators, retailers and others such as the NZTA
    - a focus on changes that would most effectively drive innovation around EVs and other distributed energy resources such as:
        - increasing EV uptake (via incentives/programs/initiatives/policy settings)
        - retailers offering demand flexibility
        - visibility of LV networks and demand data being shared/available/published
        - reviewing the regulatory funding in light of the Zero Carbon Act
        - removing the low fixed charge (LFC) given its distortionary effect on the economics of EVs/EV charging
        - recognition that the Incremental Rolling Incentive Scheme (IRIS) penalises overspending on OPEX or CAPEX. Flexibility is needed within the next 5-year regulatory cycle – this is the timeframe in which networks will need to invest to allow DERs to operate.

Network operators should start implementing dynamic technology

- Supported by Orion, Our Energy, Meridian, Vector, Unison Networks, Electra, Powerco, Drive Electric
- Most stakeholders supported implementing dynamic technology. Limited additional commentary was provided.

4 Stakeholder divergence

Stakeholder views diverged on a number of questions canvassed in the consultation paper. In the main, the divergence was around the 'second order' questions on implementation approaches. We've noted the idea in bold and provided summarised, selected narrative from the submissions and comments received at the workshop. These areas provide an indication of areas that need further stakeholder engagement and collaboration.

NZTA should provide EV location data to Distribution Businesses.

- Supported by Aurora Energy, Orion, Network Tasman
- The NZTA providing vehicle location data to distribution businesses was supported by only a few businesses with most stakeholders noting they 'weren't sure' or that they 'needed to be persuaded of the merits'.
- Some noted that data could be provided directly from a technology source (the charger or smart meter) to the distribution business and that this capability 'will be there before EV penetration is a problem'.

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- Others noted that the NZTA should be seen as an interim solution and implemented only if implementation was feasible and simple. Some stakeholders noted that as long as privacy concerns are managed, a Central Registry should be pursued.
- Those who were supportive of the NZTA taking on this role proposed that:
    - a registry requirement for (new) systems of a certain size be established
    - a registry 'opt in' or price signals (incentives) for smaller chargers/customer groups be enabled
    - data capture should include the size and location of the EV charger and the EV battery.
    - Further questions were also raised such as:
        - whether smart meters can detect the EV signature?
        - which data is most useful to EDB operational functions?
        - how data is/would be provided/shared between retailers and distributors?
        - how could the deX technology support peak smoothing?

Dynamic Connection Agreements implementation, thresholds and customer choice

- Supported by Aurora Energy, Orion, Powerco, Drive Electric
- Stakeholder views were mixed with regard to the threshold point at which DCAs should be made available. Several stakeholders noted they should initially be deployed to larger groups – i.e. Independent Power Producers (IPP), Aggregators and virtual power plant (VPP) operators – before being rolled out to smaller customers.
- On tariffs for EVs/EV chargers and the merits of incorporating this as a package with DCAs and dynamic management, stakeholders were generally supportive. Some respondents noted that these developments should be extended to all DER, not just EVs or EV chargers specifically.
- A number of stakeholders noted that development and implementation of DCAs could be further supported by:
    - modelling to determine the threshold level and value for customer groups, with care taken to understand how value would be calculated – i.e. a short-term point of view reflecting current network capacity or a long-term view (as is done for pricing)
    - implementation via the retailer
    - making residential DCAs opt-in for customers – customers should have a choice
    - enabling DCAs as the default option for larger customers and/or extending DCA arrangements to larger customer groups (IPP, Aggregators and VPP operators)
    - extending DCAs to other types of DER
    - incorporating price signals (tariffs/incentives) to a DCA package for customers.

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- Reminding us that there is 'no silver bullet' a stakeholder noted that "beyond a relatively low penetration of DER, it will not be possible to manage quality standards by communicating with DER devices – infrastructure development will [still] be needed".

Can electricity distribution businesses give up market certainty for regulatory flexibility?

- A number of businesses responded positively to this question including Aurora, Vector, Unison Networks and Meridien Energy.
- One stakeholder noted that although they agreed with this, there needs to be a "shared risk approach between distribution businesses and customers". Another stakeholder noted that in this context, *"Part 4 must be adapted".* These stakeholders see that an agile electricity system which can respond to changes in future demand will require investments in new capabilities. This necessarily demands some regulatory flexibility.
- Several networks were less confident in the near term but agreed that this is "likely to be needed" in future.
- Contrastingly, a small number of networks disagreed noting that the current framework already has flexibility, or that government levies should be used to fund specific programs/activities.

Changes should be made to the regulatory framework funding arrangements

- This topic raised the possibility of changes to how distribution networks are funded (for example, changes to 54Q energy efficiency incentives, use of re-openers and use of subsidies) and was supported by Meridian Energy, Vector, Powerco and Network Tasman.
- Several stakeholders supported changes being made to the Section 54Q of the Commerce Act 1986. Many stakeholders said the re-opener thresholds are too high to be of practical use in supporting DER.
- In relation to subsidies, one stakeholder noted that it was 'too early to make assumptions about subsidies' even though the Part 4 approach is "not enough".
- Other stakeholder views ranged from "subsidies are not needed, the market should decide", to "care should be taken with subsidies" to "subsidies should be used to incentivise smart chargers".

5 Stakeholder uncertainty

Stakeholders were not sure about a number of propositions in the consultation paper and discussed in the workshop. In the main, these related to market structures and potential changes to markets. We've noted the idea in bold and included summarised comments received at the workshop and in submissions. Feedback indicated that further thinking is needed in these areas. These topics could indicate an extra development step in the roadmap.

How do we manage competing interests in the New Zealand energy market?

- Stakeholders held wide ranging views on managing competing interests, with customer, network and retailer perspectives driving views and comments such as:

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- network security is a priority
- we should start by agreeing a hierarchy of needs
- we can/should trial a range of possibilities
- there are many opportunities to learn from overseas experience
- regardless of the regulatory setting/policy choices, customers will choose the option that suits them
- information sharing between customers, retailers, and networks is vital
- distribution businesses need to have an understanding of potential EV impact on their networks
- enabling regulation should be industry led and focus on voltage and harmonics to balance benefits.

What changes would most effectively drive innovation around EVs/DER in New Zealand?

- Stakeholders held a range of views about what would drive innovation around EVs/DERs such as:
  - policies/programs/energy products to increase EV uptake
  - competition will drive retailers to offer demand flexibility to their customers
  - visibility of LV networks and demand data is a critical element for any innovation on EVs/DERs
  - a review of EDB allowances in light of the NZ Zero Carbon Act is worthwhile
  - removal of the low fixed charge (LFC) because it creates a distortionary effect.

What is required to progress energy market reform and necessary structural changes?

- Stakeholder responses on requirements to progress drew a range of comments such as:
  - effective leadership on regulatory policy
  - targeted research via trails to electrify the transport fleet
  - the [NZ] ENA Transformation Roadmap lays out a path to orchestration of DER, but it is the regulatory environment and adoption rates that will drive how fast we move
  - there is time to develop and grow our understanding of the potential options to successfully optimise EV charging, with some low-regrets options to be implemented in the short-term
  - an effective outcome may still involve constraining distributed energy resources (EVs/EV chargers/other DER) – now and again - to maintain stability if it is in consumer's long-term interests i.e. lowest cost relative to the alternative
  - there is merit in developing a general set of thresholds or tipping points that require or justify action – to reflect different EDB circumstances.

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Should New Zealand accelerate progress towards the DSO/DMO model?

- A small number of stakeholders supported accelerating progress on Distribution System Operator (DSO)/Distribution Market Operator (DMO) model in New Zealand.
- A number noted, contrastingly, that there are existing and near-term market issues to solve first. For example, the current demand response system doesn't consider the impact on networks. These stakeholders expressed a desire to more effectively coordinate across industry.
- A further group of stakeholders noted that a DSO could potentially play a key role in managing competing priorities.
- Several stakeholders emphasised the role of markets noting that if we "put a correct price on energy, we should let the market solve". In this vein, distribution businesses, too, will value the excess energy the highest and will therefore clear at the highest price. However, this assumes that distribution businesses have allowances to purchase the energy at the required price. Such an evolution could be pursued via the development of the DSO/DMO model. How that comes about was unclear to many with some stakeholders believing that 'organic collaboration' is sufficient.
- Just what a DSO/DMO model might look like drew various stakeholder comments such as:
    - A hierarchy of controls is required
    - The network(s) needs to be involved in the management
    - The view that voltage limits should be widened as no longer relevant
    - Price to change behaviour (Transpower model).

Demand response and other flexibility service markets should be developed and progressively include opportunities for aggregated EV coordination

- Supported by Aurora, Orion, Our Energy, Electra
- A number of stakeholders support was indicated on this point, but not enough commentary was provided to draw a clear conclusion.

6 Translating the feedback into a roadmap

The feedback provides key, foundational input to the EV Connect Roadmap.

Table 1 (below) summarises the level of support for each of the consultation questions and suggests a Roadmap action/work stream that would support the feedback. The table indicates relative support using green for consensus, orange for diverging views and white for uncertainty. If the feedback provided drew consensus, the action notes what steps need to be taken to progress. If consensus was not reached, the action notes activities that would be further developed to build that consensus in the Roadmap. The suggested actions provided are intentionally high level and will be refined as the Roadmap is developed and stakeholders are progressively engaged.

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Table 1: Feedback summary and Roadmap actions

Consultation question	Level of support	Roadmap items to consider
Implementing a co-ordinated programme to support the introduction of EVs and other DERs		
National, strong leadership is needed to develop strategies; coordinate input from regulation and policy makers and industry; develop regulation, commercial, technical frameworks.	●	Provide regulators with an industry direction (EV Connect Roadmap).
A coordinated approach is needed on New Zealand's energy market structures and market reform	●	Lobby for government assistance to co-lead (with industry) the changes needed.
		Ensure all stakeholder groups are represented – including car manufacturers, consumers, 3rd party charge providers, aggregators etc.
		Consumers/engage with consumers to understand what services they want and the value of those services.
What changes would most effectively drive innovation around EVs/DER in New Zealand?	○	Assess the many views and ideas provided – select options to proceed with.
What is required to progress energy market reform and necessary structural changes?	○	Assess the many views and ideas provided – select options to proceed with.
Implementing a DSO/DMO model and service market		
Should New Zealand accelerate progress towards the DSO/DMO model?	○	Stakeholders supported the development of the DSO/DMO but there was much debate about how it would operate, when it would be needed and the bounties of its responsibility. The Roadmap will establish for consultation: • hierarchy of security • scope • who is best to operate an operating framework
Demand response and other flexibility service markets should be developed and progressively include opportunities for aggregated EV coordination	○	Develop flexible service options as part of developing the DCA. Trial potential services with consumers and retailers.
How do we manage competing interests in the New Zealand energy market?	○	Assess the many views and ideas provided – select options to proceed with. Compelling suggestions included: • network security is a priority • agreeing a hierarchy of needs reflect customer choice
Data registry		
National EVs and EV chargers data registry and data sharing is a good idea.	●	Introduce a shared EV and charger data registry.
		Define information /data to be held on register.
NZTA should provide EV location data to Distribution Businesses.	●	Consider and consult on possible alternative entities to hold and operate a registry.
Dynamic Connection Agreements		

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Consultation question	Level of support	Roadmap items to consider
Dynamic Connection Agreements (DCAs) that enable dynamic management of EV chargers and/or other distributed energy resources are a good idea.	●	Introduce dynamic connection agreement – develop and circulate template for feedback
Network operators should start implementing dynamic technology	●	As above
Dynamic Connection Agreements implementation, thresholds and customer choice	●	Engage consumers and retailers - develop services/DCA operating parameters that customers can choose at a price they want to pay.
Standard protocols for EV		
Standard protocols for EV technologies – Open Charge Point Protocol (OCPP) is a good idea.	●	Develop standard protocols for EV technology that can be presented to the EA
		Review standards for other jurisdictions and assess their appropriateness – including whether they would restrict future technologies from being used. Consider OCPP as the starting standard
Low voltage network development		
Low voltage visibility and monitoring of EV (or other DER) is a good idea.	●	Develop visibility and monitoring on the low voltage network. Leverage the ENAs work on LV monitoring business case and support the investments inclusion into regulatory allowances
Service pricing		
Network tariffs/incentives (or a package of both) can be used to influence customer behaviour.	●	Continue to develop tariffs and incentives that reflect the value of services offered
		Consider tools to support consumers to benefits from tariffs and incentives – education, awareness, and technology
		Consider further trials to develop an understanding of what consumers value and how they prefer to manage their energy use
Service quality		
Responsibility for network quality of supply should remain with distribution businesses, but there is (also) a role for the market to help enable and facilitate.	●	Responsibility of supply security remains with Distributors (rather passed to a market)
		Develop clear and enforceable network standards to ensure network security
Regulatory framework/funding		
Can electricity distribution businesses give up market certainty for regulatory flexibility?	●	Review the regulatory funding mechanisms once the services that will be offered in the DCA have been defined. Consider how a network would fund purchasing DCA services.
Changes should be made to the regulatory framework funding arrangements	●	Develop a framework for a service market. Consider: • Changes needed to the regulatory framework to allow distribution networks to purchase services to assist in managing the quality of supply • How networks will price the value of network quality

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7 Next steps

We are grateful to all stakeholders who provided input through our consultation on this project and related regulatory, policy and market settings.

Our next steps are to complete and release our EV Connect Roadmap and to continue to engage with stakeholders to work collaboratively on multi-party consensus and action.

The EV Connect Roadmap will be released as a draft in May 2021 and will outline our future vision for EVs, networks and customers in New Zealand. We expect to run a second consultation workshop on the proposed Roadmap in May and then release a final version of the Roadmap that incorporates further stakeholder input and helps us to refine key actions and activities.

The Roadmap will outline – at a high level - initiatives and actions that we can / will take with our partners and stakeholders to ensure the reliability of networks and customer choices and preferences for EVs are maintained into the future.

Beyond this project, we look forward to working on further collaborations with government organisations, private energy companies across distribution, retail and energy technology, energy consumer and transport groups that engaged with us on EV Connect.

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8 Appendix A: Stakeholder consultation questions

Table 2: EV Connect Consultation Questions

Section	Ref	Topic	Questions
2		Imperative for change	
	2.1	International EV context	What policy choices other advanced EV markets would be appropriate or valuable in New Zealand? Do you agree that the issues that Australia has experienced with solar PV are concomitant to emerging EV uptake in New Zealand? Would you agree that some of the actions Australia has taken recently would be relevant to New Zealand policy and regulatory discussions with regard to EV uptake?
	2.2	Postcard from Australia	Do you agree that the issues that Australia has experienced with solar PV are concomitant to emerging EV uptake in New Zealand? Would you agree that some of the actions Australia has taken recently would be relevant to New Zealand policy and regulatory discussions with regard to EV uptake?
	2.3	New Zealand's EV context	Given the rapid changes occurring in technology – which can go from 'emerging to critical' in one regulatory cycle – what is needed to allow more agile, flexible responses by lines companies? How do we as an industry move from 'talking about what changes should be made', to making those changes? Given regional diversity and non-uniform approaches across New Zealand, what additional steps or challenges do we need to overcome?
	2.4	Wellington Electricity	We intuitively believe customers will be better off with a tariff and manage option – what incentive and tariff arrangements would you like to see develop? Should retailers be required to pass on a new tariff to their customers, even if it's opt-in? What other ways could be considered to shift EV charging to maintain stable network operating conditions?
3		What networks can do to support expansion of EVs	
	3.1	Network options to address low voltage visibility	Do you agree that LV monitoring is a prerequisite for ongoing power quality management as customers make investments that create a more dynamic network? Are the above options for improving LV monitoring are right? What would you add or change? What would a collaborative approach to LV monitoring look like? Are there other approaches that could be considered for improving visibility – are there any device based approaches that would help?
	3.2	Dynamic operations	Will customers, or retailers or aggregators see a different hierarchy of needs in relation to the performance of the distribution network? Do you agree that evolving technology and advanced communications provide more 'eloquent' ways of managing the performance of the distribution network?
	3.3	Network policies and standards	Do you agree that it would be sensible to implement a regulatory support framework and / or device requirement for EV charging technologies similar to the existing approach for distributed generation? Should the central vehicle registry (NZTA), or another entity, be enabled/tasked with capturing and sharing data with the electricity registry of EV ICP locations? How will privacy be coordinated as an enabler rather than a barrier?
	3.4	Network tariff charges/incentives	TOU tariffs are easier to explain when retailers engage with their customers, however more sophisticated signals can be generated through demand signals. Do you foresee TOU being a significant price incentive for charging behaviour or are capacity or demand signals required? Do TOU tariffs provide sufficient equity for all customers so cross-subsidies by non-EV owners are avoided? If tariffs are insufficient to drive behaviour, ie fuel/electricity makes the lines charge differential too small to influence behaviour, what other congestion reduction steps could be taken?
4		What can be done in partnership with others?	
	4.1	Dynamic Connection Agreements	Are market participants in support of dynamic agreements with customers so actions can be taken to stabilise the distribution grid?

	4.2	EVs/EV Charging Assets Registration Information	Do you agree that development of DCAs is appropriate to EVs/EV chargers? Should there be a size/threshold minimum for their application? Should they be extended to other types of devices? Are there other or alternative approaches that should be considered? Are there other policies, incentives or mandates needed to proceed with DCAs? Do you agree that a national EV registry is worth considering? Should this be applied more widely (ie. not just EVs)? Why should such information be provided? If a Registry was established, what would you like to see underpinning it? (Incentive structures; regulatory requirements; Connection agreements / tariff + connection agreement incentive arrangements provided by EDBs; or something else) If such a Registry was established, who could/should supply this information to the EDB? If such a Registry was established, what data would be required, how and who would determine it? How would it be shared?
5		Standard protocols for EVs in NZ?	
		-	Do you agree that a standard like OCPP is the most appropriate protocol to encourage as we progress to interacting / setting up interfaces with EV charging equipment? Why/why not? To progress implementation/ adoption, what steps are appropriate for a network business, or others?
6		Preserving structures while maintaining standards	
	6.1	Market structures	Do you agree that there is risk and duplication with the current unregulated approach to DER market development? Would you like to see the industry develop a coordinated approach to DER market development? Should the responsibility for managing distribution quality remain with distribution companies or are there other natural operators who can provide this service and what would this look like particularly from other consumer protection laws (consumer guarantee act)? How will the competing benefits of separate market participants be managed to preserve customer supply quality? The trade-off with regulatory flexibility is regulatory certainty. Are you comfortable giving up price path certainty to allow a networks allowances to reflect new costs? What changes do you think are most beneficial to provide the flexibility to enable innovation? Are NZ retailers interested in/willing to using DER, whether aggregated by them or aggregators, to respond to nodal spot prices (i.e. the combination of energy market and transmission congestion signals)? Is this sufficient to incorporate distribution prices into the nodal price signal, and move towards DER response to manage congestion in distribution networks?
	6.2	Regulatory framework and funding arrangements	Is the 54Q application path the mechanism to develop as part of DER becoming part of the DPP? Should DER be part of a reopener and show maintaining an existing network which has further LV visibility and management investment to ensure quality continues where DER penetration has reached a certain level Will customers require subsidies for smart enabled DER devices so we can maintain management of quality standards at the LV distribution level. Ie every EV which needs 3kW or 4kW or above charging is given an enabled charging device by the car dealer?
	6.3	Market evolution	Thinking ahead, are we better to prepare for orchestration of DER or be faced with a regulatory intervention like South Australia and have powers to turn off DER to avoid system instability? Is the industry aligned, as yet, on the path and timeframe required to move? How would you suggest this is addressed/enabled most effectively? How far are we willing to move in order to progress and accommodate rapid adoption of EVs? How deeply should that effect the move to distribution operating models – the DSO/DMO? How and who is best placed to take on what role?

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9 Appendix B: Glossary

Table 3: Glossary

Term	Meaning
54Q	Section 54Q of the Commerce Act which requires the Commerce Commissions "to promote/encourage lines companies to invest in energy efficiency and demand side management…"
AC	Alternating Current
DR / DR Scheme	Demand Response / DR Scheme
AEMO	Australian Energy Market Operator
API	Application Programming Interface
AUFLS	Automatic Under-Frequency Load Shedding
BEV	Battery electric vehicle
Capex	Capital expenditure
CPP	Customised Price-Quality Path
DC	Direct Current
DCA/DCAs	Dynamic Connection Agreement(s)
DER	distributed energy resource(s)
DMO	Distribution Market Operator
DPP	Default Price-Quality Path
DPP3	Default Price-Quality Path applying to the regulatory period 2020-25
DSO	Distribution System Operator
EDB	Electricity Distribution Business
EECA	Energy Efficiency and Conservation Authority
EIEP	Electricity Information Exchange Protocol
EIEP3	Electricity Information Exchange Protocol "3" applying from 2019
ESB	Energy Security Board (Australia)
EV/EVs	Electric vehicle(s)
ICE	Internal combustion engine
ICP	Installation Control Point
IRIS	Incremental Rolling Incentive Scheme
LV	Low voltage
NZTA	New Zealand Transport Agency
OCPP	Open charge point protocol
OEM	Original equipment manufacturer
Opex	Operational expenditure
PHEV	Plug-in hybrid electric vehicles
PPA	Power purchase agreement
TOU	Time of Use
V2G	Vehicle to grid communications protocol
VG1	Grid-sourced charging communications protocol
VPP	Virtual power plant

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