

Charging Our Future: National electric vehicle charging strategy for Aotearoa New Zealand 2023-2035

The long-term vision and strategic plan
for Aotearoa New Zealand's electric
vehicle (EV) charging infrastructure

October 2023



**Ko te pae tawhiti whaia kia
tata. Ko te pae tata, whakamaua
kia tina [The potential for
tomorrow is determined by
what we do today**

Contents

Overview

Long-term vision	2
Long-term outcomes	3
Target	3
Focus areas	3

Outcomes

Outcome 1: EV charging infrastructure is integrated into our energy supply and infrastructure system in such a way that the system remains affordable, reliable, secure and safe	6
Outcome 2: EV users from diverse backgrounds can use accessible, affordable, secure, and reliable EV charging infrastructure when and where they need it	7
Outcome 3: Aotearoa's EV charging system is underpinned by integrated planning and standards across multiple sectors	9
Outcome 4: Aotearoa's EV charging market functions effectively, can adapt and evolve over time, and is attractive to users, operators and investors	12
Outcome 5: Our national EV charging system supports the transition to, and use of, low-emissions transport modes across the wider transport system	14
Annex 1: Types of charging	16

OVERVIEW

Overview

Long-term vision

➤ Aotearoa New Zealand's EV charging infrastructure supports an equitable transition to a low-emissions transport system in which accessible, affordable, secure, and reliable charging infrastructure is available to everyone who needs it.

This vision will guide the rapid expansion of Aotearoa New Zealand's EV charging infrastructure system from 2023 to 2035.

To support this vision, and ensure alignment with the Government's long-term strategic direction, this strategy:

- **supports the delivery of current and future Emissions Reduction Plans (ERPs)** by ensuring the necessary charging infrastructure is in place to support the target of zero-emissions vehicles reaching 30 percent of the light fleet by 2035, and by aligning with wider ERP targets and objectives
- **considers charging infrastructure in both public and private locations**, and takes into account charging behaviour, such as residential off-street, residential on-street, journey and destination charging
- **primarily focuses on charging for light EVs, while identifying initial areas for action to support heavy EV charging** and considering future charging needs for other modes across the system
- **supports an equitable transition** by considering the needs and experiences of current and future EV users from diverse backgrounds, as well as the needs and experiences of non-EV users in the transport system.

Long-term outcomes

This vision is supported by five long-term outcomes that reflect the urgent need to decarbonise the transport system while acknowledging the need for an equitable transition.

- **Outcome 1:** EV charging infrastructure is integrated into our energy supply and infrastructure system in such a way that the system remains affordable, reliable, secure and safe.
- **Outcome 2:** EV users from diverse backgrounds can use accessible, affordable, secure, and reliable EV charging infrastructure when and where they need it.
- **Outcome 3:** Aotearoa's EV charging system is underpinned by integrated and streamlined cross-sectoral planning and standards.
- **Outcome 4:** Aotearoa's EV charging market functions effectively, can adapt and evolve over time, and is attractive to users, operators and investors.
- **Outcome 5:** Our national EV charging system supports the transition to, and use of, low-emissions transport modes across the wider transport system.

Target

- There will be a journey charging hub every 150 – 200km on main highways by 2028.
- To support the installation of at least 600 EV charging stations in rural locations by 2028.

Focus areas

Each of these five long-term outcomes is supported by key focus areas, which will help to group the actions required to deliver the strategy. Further details on the work to support each action are provided in the accompanying Work Programme.

The relationship between the vision, long-term outcomes and key focus areas is summarised by the figure overleaf.

OVERVIEW

Long-term vision

Aotearoa New Zealand’s EV charging infrastructure supports an equitable transition to a low-emissions transport system in which accessible, affordable, secure, and reliable charging infrastructure is available to everyone who needs it.

To support this vision, and ensure alignment with the government’s long-term strategic direction, this strategy:

Supports the delivery of current and future Emissions Reduction Plans (ERPs) by ensuring the necessary charging infrastructure is in place to support the target of zero-emissions vehicles reaching 30 percent of the light fleet by 2035, and by aligning with wider ERP targets and objectives

Considers charging infrastructure in both public and private locations, and takes into account charging behaviour, such as residential off-street, residential on-street, journey and destination charging

Primarily focuses on charging for light EVs, while identifying initial areas for action to support heavy EV charging and considering future charging needs for other modes across the system

Supports an equitable transition by considering the needs and experiences of current and future EV users from diverse backgrounds, as well as the needs and experiences of non-EV users in the transport system

Long-term outcomes (to support the vision)

Outcome 1:

EV charging infrastructure is integrated into our energy supply and infrastructure system in such a way that the system remains affordable, reliable, secure and safe

Outcome 2:

EV users from diverse backgrounds can use accessible, affordable, secure, and reliable EV charging infrastructure when and where they need it

Outcome 3:

Aotearoa’s EV charging system is underpinned by integrated and streamlined cross-sectoral planning and standards

Outcome 4:

Aotearoa’s EV charging market functions effectively, can adapt and evolve over time, and is attractive to users, operators and investors

Outcome 5:

Our national EV charging system supports the transition to, and use of, low-emissions transport modes across the wider transport system

Focus areas (to support each outcome)

Focus Area 1a.

Minimising stress on the electricity network

Focus Area 2a.

Improving the equity of, and access to, home charging infrastructure for all New Zealanders

Focus Area 2b.

Accommodating for regional variation in charging needs and energy supply

Focus Area 3a.

Improving standardisation and interoperability

Focus Area 3b.

Optimising data capture and use

Focus Area 3c.

Consideration of planning, where appropriate

Focus Area 4a.

Accelerating commercial investment

Focus Area 4b.

Enabling innovation in new technology and business models

Focus Area 5a.

Progressing work on heavy vehicle charging (buses and trucks)

Focus Area 5b.

Decarbonising other modes across the system and ensuring a coordinated investment approach

Actions (to meet each focus area)

Government work programme: Work underway and steps to be taken in next 1-3 years (to advance each action)

Outcomes



OUTCOME 1

Outcome 1:

EV charging infrastructure is integrated into our energy supply and infrastructure system in such a way that the system remains affordable, reliable, secure and safe

Focus area 1a. Minimising stress on the electricity network

Why is this important?

Successfully meeting the ERP target of zero-emissions vehicles making up 30 percent of the light fleet will see about 1.5 million more EVs on Aotearoa New Zealand’s roads by 2035. The consequential increase in electricity demand from charging these EVs will place considerable pressure on our electricity infrastructure but also provides an opportunity to better manage demand through smart charging.

Relevant considerations

- The Energy Efficiency and Conservation Authority (EECA) has identified options to improve the energy performance of private EV chargers. Options include voluntary guidelines, financial incentives, regulation of demand response capability as part of the Minimum Energy Performance Standards regime, and setting requirements for ‘smart’ technology capable of responding to electricity demand.
- The Electricity Authority oversees regulatory settings for distribution networks, including settings necessary to facilitate distributed energy resources such as smart EV chargers. The Authority has previously promoted the idea of a separate load control tariff for EV chargers to encourage consumers away from charging during peak demand.
- The Commerce Commission has reviewed the rules and processes governing information disclosure and price-quality regulation, including matters related to this outcome.

Actions to meet Focus area 1a. Minimising stress on the electricity network

- 1.a.i** Support greater availability of vehicle and electricity use data to enable more efficient network investments.
- 1.a.ii** Support increased transparency of electricity network capacity to encourage efficient investment in public and private charging infrastructure.
- 1.a.iii** Continue to provide co-funding support for EV charging projects that demonstrate or incorporate innovative solutions to manage electricity capacity constraints.
- 1.a.iv** Promote the benefits and support the uptake of smart chargers for EVs.

Outcome 2:

EV users from diverse backgrounds can use accessible, affordable, secure, and reliable EV charging infrastructure when and where they need it

Focus area 2a. Improving equity of and access to home charging infrastructure

Why is this important?

Aotearoa New Zealand's international and domestic climate change obligations include a strong commitment to ensure our climate transition is just and equitable. Meeting our emissions reduction goals will mean new ways of getting around, including more people using EVs, as well as wider changes to how and where we live. Done well, everyone can benefit from these changes, but we need to make sure these opportunities work for everyone. Specifically in the context of EV charging, we need to consider the equity of and access to home charging for people from a range of backgrounds, especially as living arrangements diversify.

Relevant considerations

- The Government's Te Tiriti o Waitangi/Treaty of Waitangi obligations are relevant to EV charging infrastructure and implementation of this strategy should include ongoing engagement and partnership with Māori to understand their transport and charging needs and ensure these are met.
- Aotearoa New Zealand's first Equitable Transition Strategy will be published in 2024. This will help guide efforts to ensure the equity and accessibility of EV charging in future.

Actions to meet Focus area 2a. Improving equity of and access to home charging infrastructure

- | | |
|----------------|--|
| 2.a.i | Commission research into aspects of equity of access to charging including: <ul style="list-style-type: none"> • the availability of home charging for renters, and whether the Government should pursue a 'right to charge' policy for renters • the availability of charging infrastructure in locations with challenging topography and limited off-street parking • issues around charging being available within multi-unit developments • the need for charging infrastructure at social housing • the charging needs of low-income communities • the degree to which older wiring poses a barrier to home charging. |
| 2.a.ii | Explore solutions to increase the provision of public charging infrastructure in locations with limited access to off-street parking. Leverage research into charging needs across demography (action 2.a.i) and geography (2.b.iii) in completing this action. |
| 2.a.iii | Identify Māori partners with a specific interest in EV charging, and/or most appropriate entities to engage with and conduct further targeted engagement on Māori interests in EV charging. |
| 2.a.iv | Review current policies and regulations relating to residential EV charging to ensure they remain fit for purpose. |

OUTCOME 2

Focus area 2b. Accommodating for regional variation in charging needs and energy supply

Why is this important?

Work is underway to identify and address critical regional public charging coverage gaps, especially spatial mapping work undertaken by EECA to inform investment through the Low Emission Transport Fund. For example, Budget 2023 included a \$105m package to support EV charging infrastructure rollout, including funding for new journey charging hubs and to support the provision of publicly available charging in rural and remote communities. EV charging needs vary heavily with local factors, including population density, renting patterns, public transport access and supply, and parking patterns. As this Strategy is implemented further government intervention may be necessary to ensure sufficient high-quality charging provision in some locations.

Target

- We will **have a journey charging hub every 150 – 200km on main highways by 2028**. A journey charging hub is like a petrol station for EVs, offering multiple chargers at speeds high enough to get travellers back on the road as quickly as practicable. Hubs will charge many more vehicles and at faster speeds than the current national network of EV chargers that are currently spaced every 75km along our highways.

- We will support the installation of **at least 600 more EV charging stations in rural locations**, helping to reduce the barriers to EV ownership in these locations. Providing EV charging stations in these locations may also enable wider benefits, including community resilience and emergency response benefits.
- We propose to do further research on regional requirements, including consultation with groups and individuals in regional New Zealand, to inform targets and approaches to deployment across the country.

Actions to meet Focus area 2b. Accommodating for regional variation in charging needs and energy supply

- | | |
|---------|--|
| 2.b.i | Monitor the expansion of the public EV charging network in line with EV uptake forecast levels across regions to inform investment. |
| 2.b.ii | Consider the introduction of regionally specific targets for EV charging infrastructure, including for urban areas, based on the findings of the research programme. |
| 2.b.iii | Provide additional government support (financial or otherwise) to assist the planning and installation of public charging infrastructure that specifically meets the needs of rural communities. |
| 2.b.iv | Explore the role of existing vehicle service suppliers in improving regional/rural EV charging provision, alongside other options for charging locations. |
| 2.b.v | Support innovative technologies that increase network resilience in rural locations. |

Outcome 3: Aotearoa's EV charging system is underpinned by integrated planning and standards across multiple sectors

Focus area 3a. Improving standardisation and interoperability

Why is this important?

A predictable, standardised system for EV charging will help improve customer experience, and promote the use of the EV charging network. Standardisation and interoperability can help improve data collection across a range of providers, thus enabling market participants to make well-informed investment decisions, so long as this data can practicably be made available.

Relevant considerations

- As the EV charging market expands, standardisation and interoperability can improve participant experience.
- EECA is exploring options to improve the energy efficiency, interoperability, and connectivity of private EV chargers, including the current use of voluntary guidelines, financial incentives to install 'smart' chargers and regulation using EECA's Minimum Energy Performance Standards regime.
- Standards New Zealand published voluntary guidelines for residential and commercial EV charging in 2021, known as PAS (Publicly Available Specifications). The PAS will be updated in 2022/23 to reflect the latest technological developments and advice.

Actions to meet Focus area 3a. Improving standardisation and interoperability

- | | |
|---------|---|
| 3.a.i | Promote national consistency and reliability of service and a customer-centred approach to EV charging. |
| 3.a.ii | Explore policy options to ensure chargers are efficient and safe. |
| 3.a.iii | Support and enable data sharing where appropriate (e.g. EV charger and/or network providers) to support standardisation and interoperability. |
| 3.a.iv | Support local authorities to implement the required public charging infrastructure. |
| 3.a.v | Develop systems and support networks to share best-practice between local authorities, industry and central government to ensure guidance and regulations are feasible and proportionate. |

OUTCOME 3

**Focus area 3b.
Optimising data
capture and use**

Why is this important?

Improving data capture and sharing can help service providers better target their investments, and government better target interventions, to ensure that everyone has access to an EV charger where and when they need it. Third party applications, drawing on the data from EVRoam (a live database of Aotearoa’s EV charging infrastructure) can improve the EV charging experience by informing the consumer where nearby available chargers are located.

Relevant considerations

- Currently EVRoam collects real-time information from all monitored public chargepoints around New Zealand, and freely distributes it through apps and websites to inform EV drivers of charger location and availability.
- EECA is exploring the merits and challenges of various ‘demand flexibility’ initiatives, to make best use of our electricity infrastructure. EV chargers could be one component of a flexible demand system. A functional system will require device registration (to enable visibility and control over the electricity network), data capture, and robust cybersecurity.

**Actions to meet Focus area 3b.
Optimising data capture and use**

- 3.b.i** Explore the viability of mandatory data provision for those charging stations co-funded by the Crown as part of funding agreements, including AC chargers.
- 3.b.ii** Review the current data capture configuration of EVRoam and consider what other information would be beneficial to users of the EV charging network.



Focus area 3c. Consideration of housing and urban development planning, where appropriate

Why is this important?

As new developments are created, it is important EV charging needs are considered at the earliest practicable stage. The planning system has an important role to play in enabling this.

Relevant considerations

- There may be an opportunity to explore regulatory change to encourage charge-ready infrastructure or installed charge points in new builds.
- We are aware that Auckland Council is investigating mandating electricity connections to enable smart EV chargers to be installed where developers choose to provide on-site parking.

Actions to meet Focus area 3c. Consideration of planning, where appropriate

- | | |
|---------|---|
| 3.c.i | Explore the costs and benefits of introducing charging infrastructure requirements for new developments (residential, commercial, and industrial). |
| 3.c.ii | Investigate potential changes to planning strategies (for local and regional councils, e.g. minimum numbers of EV parking bays in certain locations). |
| 3.c.iii | Provide guidance material for local councils, landowners and developers (e.g. in regard to 'licences to occupy' granted to charging providers to place charging on council land). |



OUTCOME 4

Outcome 4:
Aotearoa’s EV charging market functions effectively, can adapt and evolve over time, and is attractive to users, operators and investors

Focus area 4a.
Accelerating commercial investment

Why is this important?

We seek to maximise the opportunity for a market-led rollout to support our vision for our national charging network.

Relevant considerations

- EECA continues to co-invest in the public EV charging network to support commercial partners, with a focus on high-speed journey charging.
- The Electricity Authority has been assessing any significant first mover disadvantage issues facing customers connecting to distribution networks. The Authority also recently issued guidance to distributors on how to appropriately pass-through charges under the new transmission pricing methodology, including to new and expanding connections.
- The Commerce Commission can apply rules and processes for information disclosure and price-quality regulation to electricity distribution businesses (EDBs). The review of price-quality regulation for EDBs will consider any barriers to EDBs creating new connections in a timely and cost-effective manner.
- The Publicly Available Specification, *Electric vehicle (EV) chargers for commercial applications* is designed to become a single touch point document containing all relevant general EV charging information to inform investors of all requirements.

Actions to meet Focus area 4a.
Accelerating commercial investment

- 4.a.i** Work with investors, chargepoint network operators and providers, and other key parties to support investment in public chargepoints.
- 4.a.ii** Enable data access and sharing where appropriate and needed to accelerate commercial investment.
- 4.a.iii** Ensure public funds are targeted at areas where commercial investment is unable to fully deliver, noting the need to realise the vision and ensure charging infrastructure is available to everyone who needs it.
- 4.a.iv** Work with EDBs and charging providers to aim to make the network connection process, and pricing for firms wishing to connect new load for EV chargers to distribution networks efficient and enabling. Investigate changes to the current system that could reduce ‘first mover disadvantage’.

Focus area 4b. Enabling innovation in new technology and business models

Why is this important?

The Government and the market should enable innovative solutions to manage potential impacts from an increase in demand and permit new types of charging behaviour and technology.

Relevant considerations

- EECA's Low Emission Transport Fund demonstrates innovative solutions to stimulate wider replication of successful projects in the transport sector.

Actions to meet Focus area 4b. Enabling innovation in new technology and business models

- 4.b.i** Continue to co-fund the demonstration of innovative charging technologies and work with industry to address barriers to uptake where benefits exist.



OUTCOME 5

Outcome 5:

Our national EV charging system supports the transition to, and use of, low-emissions transport modes across the wider transport system

Focus area 5a. Progressing work on heavy vehicle charging (buses and trucks)

Why is this important?

As the market for heavy EVs in New Zealand is still in its infancy, we currently do not have any public charging infrastructure to support heavy vehicle electrification. Most charging for these vehicles will be done at depot and destination, however public opportunity and journey charging will give operators further confidence to transition their fleets.

Relevant considerations

- At the 26th UN Climate Change Conference (COP26) the Government signed a Memorandum of Understanding (MOU) committing to increasing the sales of zero-emissions heavy vehicles to 30 percent by 2030, and 100 percent by 2040.
- The Government has also set aside \$30 million in Budget 2023 for EECA to implement a fund to provide grants towards the purchase of low-emissions heavy vehicles, including trucks, heavy vans and non-public transport buses.
- Te Manatū Waka has developed New Zealand's first Freight and Supply Chain Strategy. Part of the work from the Strategy includes optimising the freight network to enable freight to shift to lower emissions transport modes and developing better data and modelling approaches to support strategic decision-making, including in low-emissions infrastructure.
- Through the Low Emission Transport Fund's support for public charging hubs, EECA is encouraging charging providers to include some larger charging spaces for light commercial vehicles, vehicles with trailers etc.

Actions to meet Focus area 5a. Progressing work on heavy vehicle charging (buses and trucks)

- | | |
|----------------|---|
| 5.a.i | Continue to support the freight sector to trial and demonstrate emerging technologies through EECA's Low Emission Transport Fund. |
| 5.a.ii | Where appropriate, provide for metro truck, campervan, and car and trailer charging in new light vehicle charging developments, and the ability for heavy vehicle charging to use supporting infrastructure for physically separate charging bays, where feasible. For example, providing separate truck bays at highway charging hubs, similar to existing truck stops on the same footprint as petrol stations. |
| 5.a.iii | Work with stakeholders to identify the most immediate needs for dedicated heavy vehicle charging infrastructure and support the implementation of this infrastructure. |
| 5.a.iv | Research into what a public journey charging network for heavy vehicles might look like (based on critical freight infrastructure networks). |

Focus area 5b. Decarbonising other modes across the system and ensuring a coordinated investment approach

Why is this important?

Other transport modes will have particular charging needs, either because of their size and electricity requirements (e.g. ships and planes), or because they have specialist offroad uses and generally operate away from charging infrastructure (e.g. tractors and harvesters).

It is important that infrastructure investments now are optimised for future needs, and ensure connectivity between modes across the system, where feasible.

Relevant considerations

- We are already seeing the electrification of smaller marine vessels such as passenger ferries. Wellington is home to East by West's first fully electric ferry (Ika Rere), and another ordered from the Wellington Electric Boat Building Company. Auckland Transport have two hybrid ferries on order, which are expected to be the biggest in the Southern Hemisphere. These ferries require shoreside infrastructure to recharge. The East by West electric ferry is currently charged from a 300kW charger at its overnight berth using the same specification as the high-power EV chargers used by ChargeNet in Taupō and the Bombay Hills.
- Though electric and hybrid planes are not widely used in Aotearoa currently, they are likely to play a role in short-haul domestic travel this decade. Sounds Air has ordered three 19-seater electric planes, and intends to convert to a fully-electric fleet in future. Air New Zealand also expect to make use of electric aircraft on some shorter domestic routes by 2030. Two-seater electric planes have already taken flight in Aotearoa, and are likely to play a part in reducing emissions from pilot training.
- There are a range of other heavy vehicles, machinery and equipment that will also need to be considered in future charging infrastructure.
- Addressing 'first mover disadvantage' is being progressed under Outcome 4.

Actions to meet Focus area 5b. Decarbonising other modes across the system and ensuring a coordinated investment approach

- 5.b.i** Research the present and future system-wide charging needs for heavy vehicles, planes, trains, and ships, including opportunities for co-location of journey and destination charging.

ANNEX 1

Annex 1: Types of charging

Types of public charging

Journey charging (including hub charging)	Residential on-street charging	Destination charging
<p>Journey (or en-route) charging is used to top up midway through people’s journeys. These chargers range from fast to ultra-fast chargers. Charging normally takes 15 – 45 minutes. Typical journey charging destinations include service stations, cafes, and public rest areas. Hub charging is a communal parking area with multiple chargepoints, with the capacity to service multiple vehicles at once. Aotearoa’s public EV charging network now offers fast/rapid direct current (DC) charging stations at least every 75km for over 97 percent of our state highway network. In 2022, EECA provided co-funding for chargers in five of the main remaining network gaps. These chargers should be operational in 2023.</p>	<p>Charging stations installed to serve vehicles parked on-street. Residential on-street charging is particularly important for EV owners without off-street parking. Several have been installed in Wellington suburbs.</p>	<p>Charging is provided at destinations where the user may park for a number of hours. For example, at gyms, cinemas, tourist attractions, shopping centres, and supermarkets. Charging normally takes 1 – 2 hours.</p>

Types of private charging

Residential off-street home charging	Depot charging	Workplace charging
<p>Private off-street charging on driveways and in garages. This is considered the cheapest and most convenient form of EV charging. Users typically slow charge overnight (and pricing generally encourages this). In Aotearoa, 92 percent of light vehicles are parked at a residential property overnight, with 80 percent using off-street parking. Unsurprisingly, EECA’s research suggests that 82 percent of charging sessions occur at home.</p>	<p>Charging at private business locations for EVs used commercially, such as buses, trucks and public sector fleets.</p>	<p>Intended primarily for employees that commute to work. This can be slow or fast charging and is typically provided at private car parks. This is also a convenient way for company employees and fleets to charge their vehicles. EECA’s research suggests that about 4 percent of charging sessions are done at workplaces.</p>

Ngā Uara Te Manatū Waka Te Manatū Waka Values



WHAKAPAKARI
IMPROVING OUTCOMES



AKO
CAPABILITY DEVELOPMENT



MAHI TAHI
WORKING TOGETHER



RANGATIRATANGA
EMPOWERING
AND LEADING



KAITIAKITANGA
GUARDIANSHIP AND
PROTECTION



WHANAUNGATANGA
COLLABORATION
AND UNITY



MANAAKITANGA
CARING FOR AND
VALUING OTHERS

Copyright Information

Disclaimer: all reasonable endeavours are made to ensure the accuracy of the information in this document.

However, the information is provided without warranties of any kind including accuracy, completeness, timeliness or fitness for any particular purpose.

Te Manatū Waka excludes liability for any loss, damage or expense, direct or indirect, and however caused, whether through negligence or otherwise, resulting from any person's or organisation's use of, or reliance on, the information provided in this document.

Under the terms of the New Zealand Creative Commons Attribution 4.0 [BY] licence, this document, and the information contained within it, can be copied, distributed, adapted and otherwise used provided that –

- » Te Manatū Waka is attributed as the source of the material
- » the material is not misrepresented or distorted through selective use of the material
- » images contained in the material are not copied.

The terms of the Ministry's Copyright and disclaimer apply, available at: www.transport.govt.nz

Te Manatū Waka

3 Queens Wharf
Wellington 6011
PO Box 3175
Wellington 6140
Telephone: +64 4 439 9000
Email: info@transport.govt.nz

www.transport.govt.nz

ISBN 978-1-99-002815-1