

Driving a Low Emissions Economy

How local authorities can support
and promote electric vehicles



Energy Efficiency and
Conservation Authority
Te Tari Tiaki Pūngao

New Zealand Government



Electric Vehicles
Drive the Future

This guide aims to help local authorities reduce emissions by making their communities more friendly to electric vehicles (EVs).

It summarises the environmental, social and economic case for EVs, provides advice on operational and long-term planning, and outlines practical steps councils can take to help New Zealand transition to a low emissions economy.

It is produced by the Energy Efficiency and Conservation Authority (EECA) as part of the Government's information campaign to accelerate the uptake of EVs in New Zealand.



An environment for change

In 2017, Mayors and Chairs of 52 councils around New Zealand committed to developing and implementing ambitious action plans to reduce greenhouse gas emissions and support resilience within their own organisations and local communities¹.

These plans include supporting the use of renewable energy and uptake of electric vehicles (EVs), walking, cycling, public transport and other low carbon transport options.

This commitment to promote positive change within communities sits alongside the statutory obligations placed on local authorities to:

- meet the current and future needs of their communities, including infrastructure that is efficient, effective and future focused², and
- promote the sustainable management of natural and physical resources³.

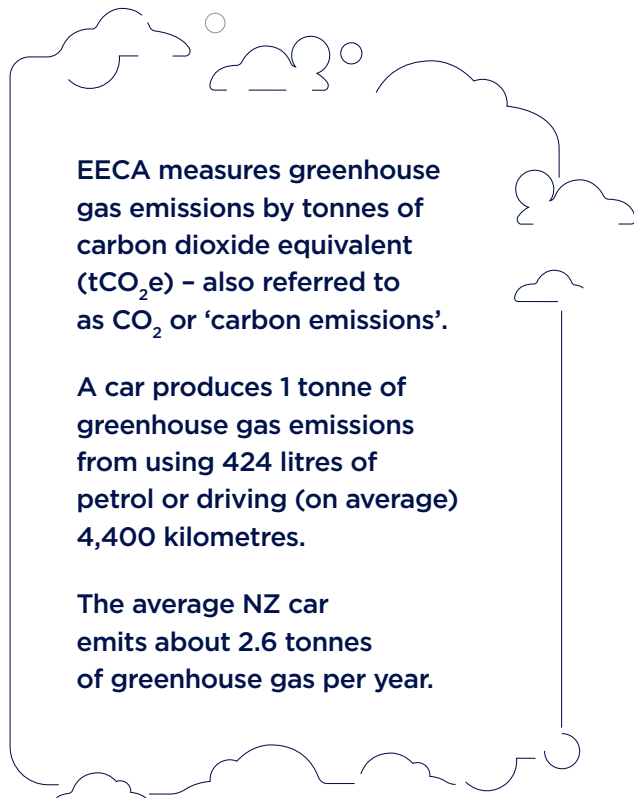


¹ www.lgnz.co.nz/assets/Uploads/Climate-Change-Declaration-updated-17-November-2017.pdf

² Local Government Act 2002

³ Resource Management Act 1991

The **Government Policy Statement on Land Transport** ('GPS')⁴ outlines the Government's strategy to guide land transport investment and resource allocation over the next ten years to ensure the transport network can meet the country's future needs. One objective is to create a land transport system that "increasingly mitigates the effects of land transport on the environment" which includes reduced CO₂ emissions.



EVs offer one of New Zealand's biggest opportunities to reduce CO₂ emissions and increase the uptake of renewable energy. Supporting the adoption and use of EVs is one of the ways local authorities can look to comply with their GPS commitments.

Government agencies are working closely together to enable infrastructure and improve EV supply, demand, feasibility, awareness and ultimately uptake.

So how can local government influence EV ownership and use as a means of reducing greenhouse gas emissions?

What is an EV?

Battery EVs (BEVs) and plug-in hybrid EVs (PHEVs) are the two main types of electric vehicle. Both have electric motors and batteries that are charged from an external power supply, but there are some key differences between them:

- A BEV is powered solely by the battery, which is charged by plugging into an electrical power point. Regenerative braking also charges the battery during driving (for example, when driving downhill). A BEV has no tailpipe.
- PHEVs have an electric motor and battery that is charged from an external power supply, and an internal combustion engine fueled by petrol or diesel. Regenerative braking also charges the battery during driving - either in EV-only mode or when the petrol or diesel engine is used. Most PHEVs drive in EV-only mode for a certain distance until most of the power stored in the battery is used, then the engine takes over automatically. During heavy acceleration, such as driving fast up a steep hill, both the petrol or diesel engine and the electric motor work together to avoid excessive draw from the battery.

Hybrids which can't plug in are not EVs, although they tend to be more fuel efficient than a comparable petrol car. Their only source of energy is the fuel used by the engine, although the battery is charged by the combustion engine, and energy is captured when the vehicle brakes (regenerative braking).

⁴ <https://www.transport.govt.nz/multi-modal/keystrategiesandplans/gpsonlandtransportfunding/>

What makes EVs the right choice?

Like many nations, New Zealand needs to take bold action to achieve its Paris Agreement commitment to reduce greenhouse gas emissions to 30% below 2005 levels by 2030.

Light vehicles accounted for 67% of New Zealand's transport greenhouse gas emissions in 2015, making EVs one of our biggest opportunities to significantly reduce greenhouse gas emissions.

Read more about the Government's EV programme at www.transport.govt.nz/ev

The Government is committed to doubling the number of EVs on New Zealand roads every year until 2021, at which point they will represent 2% of the country's total light vehicle fleet. Measures to help achieve this include road user charge exemptions, and co-funding for EV projects.

The good news is the number of EVs on New Zealand roads has grown rapidly in recent years, spurred on by improvements in both the cost-effectiveness and range of EVs, and the availability of public charging infrastructure up and down the country. New EV registrations⁵ indicate that we are well on track to achieve the Government's 2021 target.



⁵ <https://www.transport.govt.nz/resources/vehicle-fleet-statistics/monthly-electric-and-hybrid-light-vehicle-registrations/>

There are a number of reasons why New Zealand is well placed to capture a significant amount of the benefits that EVs offer⁶, including:

- 85% of New Zealand’s electricity is generated from renewable sources (unlike many other countries)
- there are sufficient consented renewable generation projects for New Zealand to recharge all our 3.6 million light vehicles if they were replaced with EVs
- 85% of New Zealand homes have off-street parking, meaning EVs can be easily charged overnight at home, and
- New Zealand’s 230-volt electricity system means every home has the potential to charge an EV.

What specific benefits do EVs offer to councils and the communities they serve? Benefits can be categorised as economic, environmental and social.



Economic benefits

- **Increased tourism:** Having charging stations sited at handy locations such as museums, cafés and local attractions can increase visitor numbers by attracting EV drivers to the district who will spend money locally while their vehicle is charging⁷.
- **Return on investment:** New EVs may be more expensive up front in terms of initial purchase costs, but the lower average running costs combined with lower maintenance costs over the lifetime of the vehicle balances out and in some cases offsets the higher upfront cost. For instance, you can save up to 85% on fuel costs by charging your EV overnight.



Used EVs can compare well with conventional imports and are available with very low odometer readings, offering fleet operators an alternative vehicle choice. Some used vehicle dealers offer warranties on the propulsion batteries.

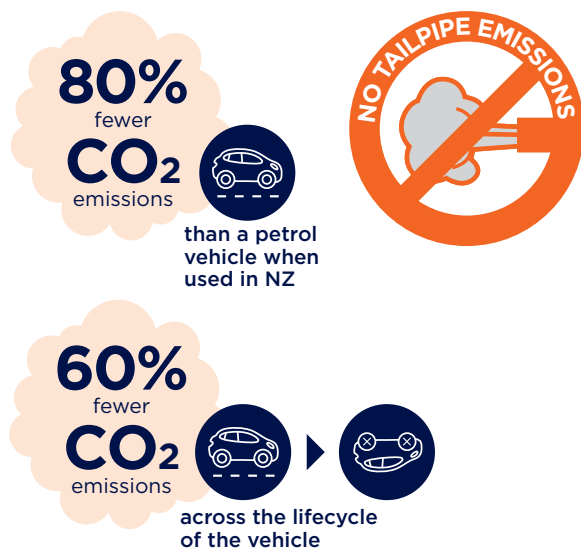
- **Investment Partnerships:** Creating infrastructure partnerships to share costs (e.g. with energy companies, trusts or ChargeNet NZ) and/or applying for other sources of funding (e.g. the Low Emission Vehicles Contestable Fund, and MBIE’s Tourism Infrastructure Fund) can make the investment in EV infrastructure relatively low cost/low risk while creating a visible statement of council’s commitment.

⁶ www.transport.govt.nz/assets/Uploads/Our-Work/Documents/Factsheet-Why-Electric-Vehicles-are-well-suited-for-NZ.pdf

⁷ Statistics for the Upper Hutt City CBD fast charging station show 66% of users live outside Upper Hutt City

Environmental benefits

- **Reduced greenhouse gas emissions:** Driving an EV can reduce CO₂ emissions by around 80%, because most of the electricity used to charge an EV is generated from renewable energy sources (85% in 2016), unlike the fossil fuels that drive our traditional transport fleets.
- **Fewer lifecycle emissions:** Even once raw material extraction, battery and vehicle manufacture and shipping are taken into account, EVs emit 60% fewer greenhouse gas emissions over their full lifecycle than petrol vehicles.⁸
- **Pollution-free driving:** Pure EVs (those 100% powered by electric batteries) don't have a tailpipe so, as well as not producing greenhouse gases, they produce no harmful exhaust emissions that cause local air pollution. Improved air quality means less respiratory illnesses and fewer hospital admissions.
- **Noise reduction:** Noise pollution is detrimental to human health, being linked to a range of health issues including heart disease and hearing loss. Not only is engine noise an issue for the occupants of vehicles, it's also a problem for the residents of towns and cities. EVs are quieter than petrol or diesel vehicles, making them an attractive option for communities.



Social benefits

- **Supporting regional development:** Less money spent on imported oil by consumers means more money spent on electricity generated and distributed domestically including by local lines companies.
- **Meeting statutory obligations and demonstrating leadership:** Promoting the uptake of EVs aligns with local authority statutory responsibilities, and offers a tangible leadership role in raising awareness and demonstrating low carbon leadership.
- **Supporting community EV uptake:** EVs entering council and other fleets today will provide a source of cheaper second-hand EVs accessible to local families and small businesses in the future.



Calculating the Total Cost of Ownership

Choosing the right vehicle for your fleet comes down to more than just purchase price. Looking at the total cost of ownership could make a big difference to your bottom line and your carbon footprint.

EECA's total cost of ownership tool⁹ (TCO) makes it easy for you to compare the cost of buying, running and on-selling new vehicles, whether they are electric, hybrid, petrol or diesel, and helps you decide which one is right for you.

⁸ www.eeca.govt.nz/assets/Resources-EECA/ev-lca-final-report-nov-2015

⁹ www.eecabusiness.govt.nz/tools/vehicle-total-cost-of-ownership-tool

Driving EV uptake

Encouraging the transition to EVs is one way local authorities can begin to target a reduction in greenhouse gas emissions and support resilience within their own organisations and local communities.

The following section outlines a range of policies and other activities which could be adopted by local authorities to help support the uptake of EVs by councils, business and the wider community.

1. Incorporate climate action in long term planning

The best place to start is to consider how New Zealand's EV growth will be planned for in your community.

Long term plans and annual plans provide an opportunity to consider how EVs can support goals regarding the environment, air quality, and economic development. There is also value in aligning goals and activities to broader timeframes, such as the Government's 2021 EV goal, our Paris Agreement target to reduce emissions to 30% below 2005 levels by 2030, and the Government Policy Standard on Land Transport.

Some councils have included EVs into their planning processes already, such as Wellington City Council's Low Carbon Capital Plan¹⁰.

2. Raise awareness

A number of things can be done to raise awareness and understanding of EVs both within council and across the local community.

One of the best ways to encourage EV uptake within your organisation is to give staff the opportunity to experience driving an EV for themselves; arrange EV test drives from registered EV dealers or direct from the manufacturer¹¹, and/or gain approval to trial an EV in your fleet.



¹⁰ [https://wellington.govt.nz/your-council/plans-policies-and-by-laws/policies/low-carbon-capital-plan-\(2016\)](https://wellington.govt.nz/your-council/plans-policies-and-by-laws/policies/low-carbon-capital-plan-(2016))

¹¹ www.driveelectric.org.nz/individuals/ev-models-and-where-to-buy

When developing a business case for transitioning to EVs in your organisation, talk to fleet optimisation service providers and/or vehicle dealers to research the opportunities EVs present (including the option of leasing versus purchasing), and to better understand the technical aspects of operating and maintaining an EV. A good place to start is www.electricvehicles.govt.nz

Finally, be sure to publicise and celebrate progress the council and community makes around EVs. For example, bring EVs to community events and let the cars, and their enthusiastic owners, do the talking.

3. Undertake a fleet audit and identify optimisation opportunities

As well as the more traditional direct ownership model, other business models for vehicle management are now available to organisations, such as fleet leases and electric car share schemes.

Consider a fleet audit to see where you could make cost and emissions savings. A fleet audit will help you to identify whether your current fleet is fit for purpose and understand which vehicles could be replaced with EVs, and in what role(s).

Installing telematics in your vehicle fleet will enable your organisation to better understand how your vehicles are being used. Telematics allow you to record travel information such as distance and time travelled, the routes being driven, driving speeds, right down to how quickly a driver is braking. This information is perfect in helping an organisation to optimise fleet efficiency and identify ideal EV substitutions.

Case Study: Yoogo - Electrifying Christchurch

Source: www.yoogoshare.co.nz



On 15 February 2018, Prime Minister Jacinda Ardern officially launched Christchurch's first 100% EV sharing service, a scheme the Christchurch City Council hopes will drive transformational change in terms of carbon emissions, and attitudes about future vehicle ownership.

The scheme provides businesses and the public with access to a pool of 100 EVs from hubs around the city, making it the largest scheme of its type in the southern hemisphere.

Led by the Christchurch City Council in partnership with Yoogo, the initiative received funding from round two of the Low Emission Vehicles Contestable Fund and the Christchurch Agency for Energy Trust.

The scheme's foundation partners included: Ara Institute, Aurecon, Beca, Canterbury District Health Board, Chapman Tripp, Christchurch City Council, Environment Canterbury, Meridian Energy, Tonkin and Taylor, Warren and Mahoney, Christchurch International Airport and Jacobs.

Learn more about Yoogo's EV sharing scheme at: www.yoogoshare.co.nz

4. Transition your fleet to EVs

Transitioning your fleet to electric requires a clear plan and timetable.

A simple place to start is to encourage council staff to prioritise EVs when hiring cars or booking taxis, and to support low emissions service providers, such as for courier deliveries. As technology develops, heavy vehicles such as buses, trucks, and other forms of transport will also begin to switch to electric.

Exposing staff to EVs in this way will make the transition to an EV fleet easier as they will be more comfortable with EVs and their performance in everyday situations. The next step is to make sure your organisation has a clear policy in place around the type of vehicles it will consider when replacing existing vehicles in the fleet.

Masterton District Council, Whangarei District Council, Hawke's Bay Regional Council, and Greater Wellington Regional Council¹² have all adopted 'electric first' policies into their operations. This means that all fleet vehicles purchased are fully electric, unless an EV is not fit for the specific work purpose. Where a fully electric EV cannot be purchased, a plug-in hybrid is the next preference, with a conventional vehicle the last resort. Approval for opting out of an EV purchase rests with the executive management team.

How Greater Wellington Regional Council is electrifying its vehicle fleet.

An information paper for vehicle fleet managers about electric vehicles, charging infrastructure, and practical ideas on how to transition a fleet to electric.



Source: GWRC electric vehicle policy

New Zealand Government Procurement's EV catalogue provides a list of EVs¹³. This list will continue to grow as new EV models enter the New Zealand market¹⁴.

A growing number of dealers sell low-mileage used EVs which offer great value. However, consider safety ratings as some Japanese domestic EVs sold as used vehicles in New Zealand do not have a five star safety rating, and ask for battery warranties.

EECA provides a cost calculator¹⁵, and agencies and local authorities wanting to add EVs to their fleet may be able to apply for funding through an interest-free Crown loan scheme¹⁶.

¹² www.gw.govt.nz/assets/Climate-change/GWRCElectric-vehicle-policy-2016.pdf

¹³ www.procurement.govt.nz/contracts/motor-vehicles

¹⁴ www.driveelectric.org.nz/many-more-plugin-vehicle-models-about-to-reach-new-zealand

¹⁵ <https://www.eecabusiness.govt.nz/tools/vehicle-total-cost-of-ownership-tool/>

¹⁶ <https://www.eecabusiness.govt.nz/funding-and-support/crown-loans/>

Case Study: Northland Regional Council



In May 2014, Northland became the first region in New Zealand to offer EV drivers access to a fast charging station with the very first station installed in Whangarei.

The Northland Regional Council (NRC) has also been a keen early adopter of EVs. By 2018 it had seven battery electric vehicles (BEVs), three plug-in hybrid electric vehicles (PHEVs), and 80 solar panels atop its headquarters to help charge them.

Councillor Justin Blaikie says the NRC's foray into EV ownership has been driven by the potential long-term financial savings and environmental benefits.

Its current fleet comprises of a number of different EV models that offer differing range options depending on the purpose of the vehicle: from 120km-250km per charge for its BEVs to over 500km for

its PHEVs. The council aims to eventually convert most of its 60-plus vehicle fleet to EVs.

NRC's 20kW solar installation generates enough power to drive about 500kms per day, cutting around \$26,000 from the council's annual fuel bill.

NRC has also worked in partnership with the Far North District Council and nationwide EV charging provider ChargeNet NZ to install five fast charging stations across Northland, enabling locals and tourists to travel the entire region in an EV. Dubbed 'Northland's Crimson Coast EV Highway', the project was supported by the Government's Low Emission Vehicles Contestable Fund, administered by EECA.

5. Support the rollout of public charging infrastructure

One of the keys to building public (and staff) confidence in EVs is ensuring there are sufficient charging facilities available in convenient locations for both local motorists and visitors to the region.

The Transport Agency's guidelines on public charging infrastructure provide excellent advice on evaluating, siting and installing EV infrastructure¹⁷.

Before determining whether a site might be suitable for public EV charging infrastructure, it's important to understand how you expect the charging station to be used. Inexpensive slow chargers suit long-stay locations; high cost fast-charge stations suit short-stay locations.

Ideal locations include highly visible or popular destinations (such as cafés, museums and recreation centres). Consider installing charging facilities in new/upgraded council facilities as a standard feature.

Consider partnerships (e.g. with energy companies or trusts or ChargeNet NZ) to share costs. Other sources of funding include the Low Emission Vehicles Contestable Fund¹⁸ and MBIE's Tourism Infrastructure Fund¹⁹.

Several councils have undertaken infrastructure projects, including street side, car parking buildings, and outside iSites.

¹⁷ <http://www.nzta.govt.nz/planning-and-investment/planning/transport-planning/planning-for-electric-vehicles/national-guidance-for-public-electric-vehicle-charging-infrastructure/>

¹⁸ www.eeca.govt.nz/funding-and-support/low-emission-vehicles-contestable-fund

¹⁹ www.mbie.govt.nz/info-services/sectors-industries/tourism/tourism-infrastructure-fund



6. Encourage electric buses

'Electric vehicles' means more than cars – electric buses are ideal for public transport. 100% battery electric bus technology is well established overseas and has made its debut in New Zealand.

Regional and unitary councils are in a unique position to facilitate the uptake of electric buses by recognising their benefits through their public transport contracts.

Communities benefit when diesel buses are replaced with electric because emissions detrimental to air quality and human health are eliminated. Electric buses are also much quieter, and as they run on New Zealand's highly renewable electricity, they contribute to your community's efforts to reduce greenhouse gases.

All councils ought to recognise the importance of charging infrastructure location for electric buses operating in their jurisdiction. To avoid significant additional costs, it needs to be close to local electricity distribution networks with enough capacity to meet charging demands.

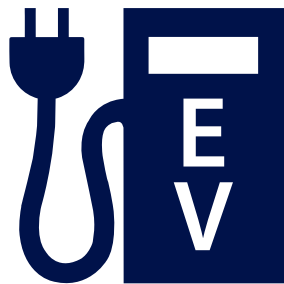
Councils can recognise this in any resource consent process. It could be critical when decisions are being made on where to locate bus depots, roadside opportunity charging facilities for a specific bus route, and new or upgraded transformer and electricity distribution infrastructure.

7. Be EV friendly

As a council you can demonstrate your support for EVs by making it easier for EV drivers to travel around your district.

One way to do this is by offering EVs special access to roadways including special vehicle lanes - in September 2017 Auckland City Council and the Transport Agency began a 12 month trial of such a scheme²⁰.

Councils can also offer convenient EV-only car parking and designate car parking exclusively for EVs adjacent to charging infrastructure, using the gazetted Electric Vehicle Parking Only symbol²¹.



Finally, provide directional and positional signposting²² from highways and main streets to highlight the availability of charging facilities to both EV owners and non-EV owners, and help overcome range anxiety.



The New Zealand Transport Agency recommends that approved signage and symbols are used for all public and private parking spaces reserved for EVs charging their batteries.

8. Introduce regulations for charging infrastructure

Councils can allow for the future proofing of public infrastructure, dwellings and municipal buildings. District Plan rules can specify public charging infrastructure as a permitted activity and set the number of charging units required on buildings and apartments.

²⁰ www.nzta.govt.nz/media-releases/green-light-for-auckland-electric-vehicle-bypass-lane-trial

²¹ <https://www.gazette.govt.nz/notice/id/2017-au1528?noticeNumber=2017-au1528>

²² <http://www.nzta.govt.nz/planning-and-investment/planning/transport-planning/planning-for-electric-vehicles/national-guidance-for-public-electric-vehicle-charging-infrastructure/enabling-the-development-of-public-charging-infrastructure/advice-for-road-controlling-authorities/symbols-signs-and-road-markings/>

The EV experience

Driving an EV is much the same as a petrol or diesel car – but people often notice a few differences.

- **EVs are quiet.** Reduced noise levels mean drivers often feel more focused and calm when driving EVs – an observation backed up by a recent study of London taxi drivers. From outside the car, tyre noise can be heard once they reach about 25km per hour. Some EVs emit audible sounds at low speeds to alert pedestrians and cyclists.
- **They're smooth and peppy:** EVs can accelerate quickly and smoothly from a standing start. With no gears to work through, an EV is able to apply full power as soon as you touch the accelerator pedal. This means they're great hill climbers.
- **They handle well:** The heavy battery packs fitted to the floor give EVs a lower centre of gravity, so they usually enjoy superior handling and are less likely to roll in an accident.
- **The braking is different:** The regenerative braking system means the car starts to slow as you lift your foot off the accelerator. Lifting further or fully off the pedal causes it to slow more sharply (and the brake lights will come on).
- **Safety is designed in:** EVs sold in New Zealand must meet the same minimum vehicle safety standards as petrol and diesel vehicles. Their high-voltage electric system is designed to automatically deactivate in a crash. They are far less likely to catch fire in an accident than petrol or diesel vehicles.
- **They suit our climate:** Battery life can be reduced by extreme temperatures – below freezing and above 30 degrees Celsius – but EVs are well suited to New Zealand's temperate climate.



Additional information and resources

Electric Vehicle Information Website

www.electricvehicles.govt.nz

Frequently Asked Questions about EVs

www.leadingthecharge.org.nz/faq

Suitability of EVs

for New Zealand Fact Sheet

www.transport.govt.nz/assets/Uploads/Our-Work/Documents/Factsheet-Why-Electric-Vehicles-are-well-suited-for-NZ.pdf

Low Emission Vehicles Contestable Fund

www.eeca.govt.nz/low-emission-vehicles-contestable-fund

email: levfund@eeca.govt.nz

New Zealand Government Procurement

www.procurement.govt.nz/contracts/motor-vehicles/motor-vehicle-suppliers

MBIE Tourism Infrastructure Fund

www.mbie.govt.nz/info-services/sectors-industries/tourism/tourism-infrastructure-fund

EECA Interest-Free Crown Loans

www.eecabusiness.govt.nz/funding-and-support/crown-loans

Public Charging Infrastructure Vision, Guidance, and Charging Station Maps

www.nzta.govt.nz/electric-vehicles

Setting Up Public Charging Infrastructure

<http://www.nzta.govt.nz/planning-and-investment/planning/transport-planning/planning-for-electric-vehicles/national-guidance-for-public-electric-vehicle-charging-infrastructure/>

WorkSafe New Zealand Electric Vehicle Charging Safety Guidelines

<https://worksafe.govt.nz/laws-and-regulations/consultations/review-of-the-electric-vehicle-charging-safety-guidelines/>

'Electric First' example vehicle policy text and electric fleet case study

www.gw.govt.nz/electric-vehicles

Electric vehicle events, information guide, car models and dealer list

www.leadingthecharge.org.nz

Drive Electric, not-for-profit EV advocacy group

www.driveelectric.org.nz

EECA EV queries

email: info@eeca.govt.nz

phone: 0800 358 676



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