



The low-down on adding EVs to fleets

A guide for businesses considering transitioning their fleet to electric vehicles includes two contrasting examples.

One is Westpac NZ's introduction this June of 65 new electric and plug-in hybrid Hyundai Ioniq cars to its fleet, leased from Custom Fleet.

The other is Meridian Energy's ownership, rather than lease, of second-generation near-new Nissan Leafs and late model all-electric Hyundai Ioniqs, along with the latest Nissan Leafs.

The two are model examples included in Drive Electric's newly released white paper *Building an Electric Fleet: A "How-to" Guide for Businesses Considering Transitioning to Electric Vehicles*.

The guide holds up Westpac NZ commercial services operations and property director **Rob Halsall's** work over many months.

Halsall says if he had got the "how to" guide at the start it would have been much easier.

He says anyone who can answer the guide's six questions will see a compelling case for going electric.

The questions are: What do you need to know about your staff? What do you



Rob Halsall, left, and Andy Sinclair.

need to know about your fleet? Vehicle selection – what do you need to know to choose the right EV? Tool or trade or pool vehicle – what you need to consider. What about charging infrastructure? Do the numbers stack up?

Having the right data was important for both Halsall and Meridian's procurement manager **Nick Robilliard**.

GPS data of how Meridian staff were using vehicles was critical in making

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Feeding the EV pipeline

An issue plaguing the motor industry is feeding the pipeline of vehicles to meet the Government's target of 64,000 electric vehicles registered by 2021.

Meeting the needs of the future EV retail industry, as well as the skill shortage in EV servicing, are some of the issues addressed by the EV-world NZ Motor Industry Forum on August 9.

This forum provides the lead in to the EVworld NZ Industry Conference and trade expo on August 10 and a free public day on August 11 at the ASB Showgrounds in Auckland – all hosted by Conferenz.

Industry representatives will discuss the future pipeline and the importance of upskilling the sector to create an environment providing for the development of EVs across public and private sectors.

The Motor Industry Forum takes a deeper dive into some of the issues at the EVworld NZ Industry Conference on August 10 and aims to bring together the entire motor industry to provide a platform for discussion and maximise the EV opportunity for New Zealand's fleets and public vehicle sales.

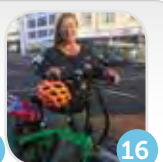
David Vinsen from the Imported Motor Vehicle Association (VIA) will chair the forum, while **Dean Sheed** provides insight from Drive Electric on the forecast for EV supply and demand.

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Hyundai Kona Electric flown in for Fieldays

Hyundai New Zealand general manager **Andy Sinclair** did the honours at the Australasian unveil of the all-electric Kona SUV at Fieldays this month.

It was brought in by plane especially for the event, displayed at Hyundai's Mystery Creek site near Hamilton.

The Kona Electric cleverly blends ground-breaking EV technology with New Zealand's favourite body style - the SUV, Sinclair says.

"It's fantastic to be able to bring the full EV version of the Kona to New Zealand so quickly and to showcase it at Fieldays. Due to massive public interest in this car we have worked hard to ensure New Zealand is one of the very first markets to be able to see the Kona Electric. There's a lot of excitement among the public for this new model.

"We have New Zealand's number one selling battery electric vehicle and with the Kona, it just ups the ante. It's [the Kona's] Australasian debut, [the] first time for the public to

see and with a real-world range over 400kms, we think it'll be a real game changer."

Sinclair says Hyundai New Zealand has gone for the 64kWh Kona with the longest range (more than 400km) in recognition of Kiwis' outdoors lifestyle.

The battery can be charged from empty to 80% in 75 minutes using a fast charger.

Final pricing will be announced closer to the Kona Electric's public launch later this year, although customers can pre-order now from their local dealer.

Check out the launch of the new Hyundai Kona at Fieldays on the *Auto Media Group* YouTube Channel. ■



Audi dealerships get ready for recharging challenges

If there's a bit of earthwork happening at the nearest Audi dealership, don't be too surprised.

The New Zealand points of sale for four-ring-branded cars are each having two ultra-fast charging stations installed, ready to serve the two new 150kW super-



Dean Sheed

electric vehicles that Audi New Zealand will release before 2020.

"There's a lot of infrastructure work going on at Audi dealerships at present, and the electricity supply to those dealerships is being expanded so that two cars can be fast-charged at once," Audi New Zealand general manager

Dean Sheed says.

"We're also working with Vector on providing recharging solutions for our business and residential customers."

With their 95+kWh lithium-ion battery packs, the coming e-tron Quattro and e-tron GT, represent the next level of electric vehicles, and can roam up to 460km between recharges.

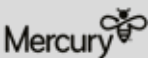
While the sporty GT has

yet to be driven in public, prototypes of the Quattro were available for a short drive programme attached to the vehicle's unveiling at this year's Geneva Auto Salon in March.

Apart from lacking side mirrors (replaced by TV cameras and screen views), the Quattro could pose as just another variant of Audi's

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POWER DEALS FOR EV USERS

Company	Energy Deals	Where	Cost to charge LEAF*
	Plug-in Vehicle Fuel Package: 20% discount on your energy bill from 9pm – 7am, available on multiple properties, guaranteed discount for 2 years from signing up to offer, 10% PPD is included in these calculations.	Auckland Wellington Christchurch	\$5.75 \$5.82 \$5.63
	Electric Car Plan: Super-low night rates that start at the earlier time of 9pm, until 7am daily. Available for your entire home's electricity needs. Rates are fixed for 3 years and includes 20% PPD. And, join before 31 August 2018 and get a year's worth of free EV charging on us! (bill credit of up to \$300)	Auckland Wellington Christchurch	\$4.91 \$4.15 \$2.80
Contact Energy	Freedom plan: Excellent night rates, no fixed term, 20% PPD has been included, check if the matching daytime kWh rate will affect your overall bill.	Auckland Wellington Christchurch	\$5.86 \$4.89 \$3.41
Ecotricity	Low Solar: Low Usage plan for EVs & can buy back solar energy, no fixed term	Auckland Wellington Christchurch	\$6.03 \$4.37 \$4.28
Electric Kiwi	One Plan with Hour of Power: Free hour of off-peak power daily – included and calculated to be 2 kWh for charging at 8 amps. Note: this could be different depending on your designated Hour of Power.	Auckland Wellington Christchurch	\$6.46 \$6.49 \$6.71
Flick Electric	Wholesale rates plus their Flick Fee: No fixed term, EV rate in Wellington. Calculated using an average spot price of 5.7c per kWh.	Auckland Wellington Christchurch	\$5.79 # \$3.58 # \$4.36 #
Genesis Energy	Classic plan: Excellent night rates, no fixed term, 10% PPD has been included, check if the matching daytime kWh rate will affect your overall bill.	Auckland Wellington Christchurch	\$6.61 \$4.10 \$3.62
Paua to the People	Cheap As Plan with EV night rates: No fixed term. Calculated using an average spot price of 5.7c per kWh	Wellington	\$3.25 #

*Approximate cost for a full charge of a 24kWh LEAF in the 3 largest centres of NZ.

Please note that rates vary around New Zealand – the above costs were from Mt Wellington in Auckland, Northland in Wellington and Linwood in Christchurch. They can also depend on your meter type & the company you use. Prices vary at the different times of the day eg charging during the day may have higher costs. Flick Electric in Christchurch has higher daytime rates in Winter due to variable pricing from the lines company. The rates we have used above are calculated each month using a low user cost, overnight rates, includes 10% charging loss, prompt payment discounts (PPD) if available and GST, excludes daily charge. Please note that prices were correct at time of publishing and are subject to change. Please contact us if you would like any clarification.

Spot prices can go up and down as they are affected by demand in energy and weather conditions. We have calculated these prices using the average spot price of 5.7c per kWh at night over the last 7 years, however this is no guarantee of current or future prices.

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popular Q5 SUV range. According to Audi, external looks are the only things that the company's combustion-powered and battery-driven medium-sized SUVs will share.

The Quattro is built on a special variation of the Volkswagen Group's MLB platform, specifically designed to accommodate the sophisticated cooling system that keeps the mattress-sized battery pack operating at optimum temperature.

The GT, expected to launch a year or two after the Quattro's Kiwi market debut late in 2019, will be the first electric vehicle to be developed and built by Audi Sport.

It will be built on a dedicated EV production line at Audi Sport's facility in southwest Germany, alongside the lines that currently build the mid-engine R8 Coupe and Roadster supercars.

Audi is keeping the technical details of the GT to itself, but performance won't be lacking given the presence of rival cars like the Tesla Model S, and Jaguar's coming all-electric luxury sedan, based on the recently-released I-Pace SUV. According to a recent tweet from the corporate communications department, the GT will be the "Spearhead of Audi Sport by 2020".

Along with a new-generation A3 e-tron Sportback hatchback, the GT will bring

the number of new fully-electric vehicles launched by Audi before 2020 to three.

These three EVs – a family five-door hatch, a medium-sized SUV, and a super-luxury saloon, will evidently open the floodgates of Audi's electrification programme, and the four-ring brand will have around 20 electrified models on sale by 2025, with half of them dependent on battery power alone.

Sheed, who is also on the board of Drive Electric, the EV advocacy organisation, says that increased demand for electric vehicles will challenge present recharging infrastructure.

"Home-charging now alleviates range anxiety for electric vehicle owners to the point that it doesn't really exist anymore.

"However, home charging won't really be an option for the new 150kW EVs coming from Audi (with our present electricity hardware).

"We're going to see lots of different network expansions as our country needs around 210-230 fast DC chargers (50kW+).

The average house has

65-amps of current going into it, he says.

"If one family member is having a spa while another is cooking dinner, those two actions can consume half of that (leaving little left to charge the car).

"Ninety per cent of households only have single-phase plugs, and although 3-phase can significantly speed up battery recharging, it's still not ideal.

"The best solution will be home-storage batteries that can store surplus power at times of low loads on the grid for later car fast-charging use."

Another charging solution soon to be offered by Audi, will be inductive charging, via a pad installed in the home/work garage.

The vehicle will be driven over the pad, which will then be raised to come into contact with the bottom of the vehicle to protect pets and children from electrocution.

"We've got some really cool stuff that we're about to bring to the market," says Sheed. ■

Feeding the EV pipeline

Continued from page 1

They will be joined by EVangelists such as **Janet Lane** from MITO and **Cliff McKenna** from WelTec and Whitireia. The forum will address the imperatives for providing a more stringent regulatory environment for new and used vehicles and the opportunities to further drive the EV market here.

In addition to the Motor Industry Forum, there will be an EV Fleet Development Forum, Network and Infrastructure Forum, and Local Government Forum - each with the goal to provide a platform for deep discussion on some of the biggest barriers to NZ's EV uptake.

The EVworld EV Fleet Development Forum covers the switch to electric in the commercial fleet, looking into business case development, getting board buy-in and investigating opportunities and challenges with the EV options.

AA business vehicle solutions senior accounts manager **Mark Lloyd** hosts the forum.

Nicholas Robilliard from Meridian Energy presents the keynote address, sharing Meridian's work into the total cost of ownership and residual value for companies investigating the viability of the electric fleet.

The forum features a panel with leading industry experts – **Henrik Moller** from Flip the Fleet, **Phil Jones** from Sustainable Business Network, **Geoff Bold** from F&P Healthcare, and **Dennis Kelly** from FleetPartners NZ.

They will discuss challenges such as leasing options for fleet development, car sharing with EVs, the best models for EV fleet development and the benefits of committing to zero carbon transport.

Visit www.evworld.nz for more information. ■

More money for EV innovators

An extra one million dollars is now available for EV funding in New Zealand during the next year.

That makes \$7 million available for the Energy Efficiency and Conservation Authority (EECA) low emission vehicles contestable fund for rounds five and six.

"We want to get more projects underway earlier, when investment is likely to have greater impact in

accelerating uptake of EVs," EECA chief executive **Andrew Caseley** says. "This will more effectively support the target of 64,000 EVs by 2021."

The funding is being moved forward from the final year of the contestable fund, 2020/21.

Round five is due to open in mid-

August, with successful applicants from round four announced at around the same time. ■



Andrew Caseley

A history of women and EVs

Miss Daisy Can Drive Herself was a talk by **Pam McKinlay**

about the history of electric vehicles and women at Techweek18's final EV event.

Appropriately, it was at the Otago Pioneer Women's Memorial Hall during the 125th celebration of women's suffrage in New Zealand.

Like many woman drivers in the early 20th century, **Clara Ford** (wife of **Henry Ford**) drove herself in a Detroit Electric. Women preferred them as they were simpler to operate with no cranking required or gears.

This theme seems to continue, McKinlay says. Historically, EVs were sometimes styled with fake radiators to appear more like the "masculine" gasoline vehicles.

Present early EV adopters and advocates are equally likely to be men and women, but the most vocally dismissive tend to be older and male. Younger ones really get it, she says.

McKinlay believes about



Pam McKinlay

75% of the audience packing the hall were contemplating buying their first EV.

A Nissan Leaf owner and EV enthusiast, McKinlay is also an artist and a keen photographer. The McKinlay Leaf, nicknamed Luxray, sports a roof rack for her family kayak

missions and has been used in exhibitions as a media player or connected to electronic work by Bluetooth to the EV's speakers.

Other Dunedin Tech-

week'18 events included **Henrik Moller** from Flip the Fleet presenting *Electric Vehicles: Clean & Green Computers on Wheels?* at the Otago Museum.

TEXpo, a public open day at Otago Polytech and Otago University Business School followed.

EV owners joined a Park-Up at the polytechnic carpark where rides and drives were offered. Seven different models of EV included two 40kWh Nissan Leafs and the new Toyota Prius PHEV were among 27 vehicles there. ■

The low-down on adding EVs to fleets

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the right calls, Robilliard says. "Your best friend in this whole process is having good GPS data and someone who can interpret and model it."

Robilliard learned pool cars at one office weren't out between 9am and 3pm, used at the front end and back end of the day so they could be taken home.

"I found I didn't need half the cars that were in one particular office and that an EV car share was the better option." So he chose Yoogo electric car share as a backup.

Routes were planned and tested to ensure fast charging access, avoiding range anxiety.

And employees could test vehicles, watch training videos and access educational tools.

"Taking people on the journey is really important," Robilliard says.

Halsall says Westpac looked at lease expiry pro-

files and decided to do the Ioniqs in bulk, maximising third party relationships.

Westpac's 65 new Ioniqs close the gap on its nearly 100 EV target by 2019, the remaining 32 to be included as leases expire.

So Westpac NZ is on track to convert 30% of its 301-car fleet to electric by the end of 2019, a commitment signed by more than 30 organisations (pages 22 and 23).

Sixty-five chargers are being installed for the fleet.

At least 50 of the new Ioniqs will be fully electric, with a 220km real-world range. The plug-in hybrids are available for staff working further afield.

By comparison, Robilliard found no good reason for buying new vehicles. "For a lot of the around town functions, where people aren't doing huge kilometres, why would I put a brand new

vehicle there?"

As a transitional step Meridian obtained several two-year-old Nissan Leafs, the money he saved on them more than compensating for the cost of new Ioniqs.

"I actually spent less electrifying the fleet."

Both Robilliard and Halsall studied related charging infrastructure.

The cost of installing chargers at offices can vary hugely.

Questions that need checking include what the power board capacity is at each site, how far it is from the board to the charger, and whether AC or DC three-phase is required.

The difference can mean spending a few hundred dollars to thousands. "I had to spend \$20,000 to run a whole new power cable at one office because there wasn't enough power, and the reality is you need to provide some headroom for the future," Robilliard says.

In one case, retro-fitting

charging stations could mean a full shut down on the multi-tenanted building.

There are also questions around home charging, such as who pays. Should the person who takes the EV home and charges it be reimbursed – something Westpac is considering. Or is it part of the car package when assigned to specific staff?

Hyundai Motors New Zealand general manager **Andy Sinclair** says Westpac NZ is putting its money where its mouth is in terms of its commitment to switch to EVs and for reducing emissions and its carbon footprint.

He says both companies can help others switch their fleets to electric.

Robilliard and Halsall agree EVs stack up in terms of greatly reduced fuel costs, maintenance, servicing and resale value.

For many businesses, fleet "greening" means they're seen to be doing something about reducing emissions causing climate change. ■



Nick Robilliard.



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Port company going electric

Electric vehicles are catching on at the Ports of Auckland.

It has five Nissan ENV 200s on site, with another due to arrive in June, plus one Fuso hybrid truck.

The ENVs are used for a variety of purposes, from driving staff around the site, to carrying safety equipment.

One is equipped to carry oil drums, so the team can do oil changes on the port's tug fleet.

Of 50 fleet vehicles at the port, about 12% are electric so far.

The ultimate aim is for the port to be emissions free by 2040, with the vehicles it uses set to play a major part in achieving that goal.

Procurement manager **Mark Wray** says a huge variety of vehicles are used at the port, from trucks, vans and utes to the standard pool car.

"Our biggest problem right now is finding suitable vehicles in the marketplace," he says.

"You can't move to EVs when there's no suitable option available."

It is particularly difficult to buy bigger electric vans or utes that would work in the port environment, Wray says.

One problem with some of the commercial EVs on the market is they are re-

stricted by how much weight they can carry.

"Some of the vehicles are restricted in terms of what you can put on them because of the battery packs," Wray says.

The ENV 200s purchased by the port are near-new vehicles with 2000 to 4000 kilometres on the clock and are sourced from Japan and the United Kingdom.



Mark Wray

Wray says even those vehicles are "getting very, very hard to find".

Each business unit has one EV to get them used to the vehicles, with

many staff now converted fans of the technology.

"Some staff had been guarded about getting EVs, but once they're in you can't get them out."

Converting some of its fleet to EVs is providing a variety of benefits for the port.

Short journeys are pretty hard on diesel engines, leading to higher emissions and maintenance costs, Wray says.

"But the EVs are perfect for those type of trips. A charge lasts three or four days. You just push the button and go."

There's a lot of administration that goes into Road User Charges, in terms of paying the tax and claiming an appropriate part of it

back.

That isn't the case with EVs, which aren't subject to the charges.

Maintenance costs have also dropped.

"With EVs it's basically brakes, tyres and windscreen wipers."

The big picture

The move to electric vehicles is part of the port's goal to be more environmentally friendly, particularly by reducing emissions.

Sustainability manager **Rosie Mercer** says in 2016 the port developed a long-term vision about where the company is headed.

"We developed a sustainability framework under which we're aiming to build closer links with the city, to be a successful business long-term and to lessen our environmental impact.

"Our vision is to leave the environment in a better state than how we found it. Reducing emissions is a critical component of that."

Along with the electrification of its auxiliary vehicle fleet, heavy equipment will also eventually be electrified.

"Our big container cranes are all electric, but our heavy container moving equipment and tugs are not and they are much harder to convert."

"As an example, the port's straddles weigh 60 tonnes and have to be able to lift their own weight in contain-

ers – turning that electric is a big ask. Tugs need to be able to pull 70 tonnes, so the task is similarly difficult" says Mercer.

"However, setting a target has been key. That's enabled us to have conversations with suppliers that we haven't had before, and it's at least got people thinking about what's possible. Our goal is to have electric alternatives in place by 2030-2040."

Another option for reducing emissions is harnessing shore power by plugging the ships in.

"When the ships are berthed, they run the main auxiliary engines using heavy marine fuel oil, a thick, tar-like substance. If we could plug some ships in, we can significantly reduce the emissions associated with the port.

"In other countries where shore power is used, electricity is often generated by coal or gas, so there are still emissions, they are just not generated on the waterfront. In New Zealand, 85% of our electricity is generated by renewables, so shore power can make a real difference to emissions."

Not all ships are equipped for shore power, but a feasibility study by the port last year showed that there were enough to make the idea of shore power worthwhile.

The next step is to build a detailed business case. ■



Tourism Holdings to have electric motorhomes available this summer

Kiwi firm Tourism Holdings Limited (THL), operator of the Britz, Maui and Kea motorhome brands, is planning on renting electric motorhomes to customers in New Zealand this coming summer season.

The company has trialed multiple vehicles, with its latest concept - the expected base for the vehicles to be made available to the public - based on the LDV EV80 cab chassis, similar to the van reviewed in *EVtalk* last month. The vehicle is a two-berth unit, with an expected range of around 140km.

The vehicle, and the routes it will be recommend-

ed the vehicle take, were developed with the assistance of the Energy Efficiency and Conservation Authority's low emission vehicles contestable fund.

Giving *EVtalk* a tour of the vehicle, THL's **Ed Burak**, who has run the development programme for the EV, explained first and foremost the vehicle needs to be a functioning motorhome like any other.

"It's important that it's a motorhome first, and the fact that it's an EV is somewhat secondary in terms of how it functions," Burak says. "We've looked at things such as the length and we've reduced it so that it's easy to

store, you have advantages of travelling on the ferry, and parking.

Attention has been paid to the interior and house systems.

"We've gone a little bit more contemporary - it's almost sort of like out of apartment living in terms of the finishes, and there's lack of handles," Burak says. "I guess in terms of some of the things which are different because of this EV approach is that we've eliminated all fossil fuels. So there's no LPG gas for cooking, for example - we've replaced that with a induction cooktop, which is nice and smooth - it looks beautiful. And it simplifies the

whole vehicle.

"Of course, lighting is all LED lighting throughout the whole vehicle. And outside of that, we're starting to experiment with different materials to just try and improve the fit and finish and the presentation, and reduce weight as well."

Alongside the development of the vehicle has been the process working out where they will travel - the comparatively short range of the vehicle and need to charge requires a different approach.

"We also are fundamentally an experience company," Burak says. "Whereas

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Tourism Holdings to have electric motorhomes available this summer

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perhaps 10 years ago we considered ourselves a campervan company. And so what that means is that we're interested in the overall experience and what the expectations of our customers are.

"We've developed itineraries which we believe slow the customer down a little bit and get them to enjoy each destination far better. We're also offering up things such as great food and wine experiences that they perhaps wouldn't be aware of if a classic tourist."

Routes will take into account charging - both existing charging infrastructure and THL provided charging points at camping



facilities - developed as part of a partnership with Holiday Parks of New Zealand. Charging points at this stage will be at up to 22kW AC. When vehicles are parked up for the night, they can be plugged into site facilities at two points - one for the vehicle and one for the house supply. The LDV is DC charge capable, though most charging is expected to be overnight.

"They're going to have EV specific sites where they can plug in for the house at the back, to charge the microwave and their phones and bits and pieces, and plug in the vehicle in the front to recharge your vehicle battery."

Burak says the EECA funding has been valuable to the project.

"The availability of that funding is fantastic and incredibly useful. What it does is make things happen faster."

The plan is to have vehicles available for rent this summer season, though the initial fleet will be small.

"It is quite a control set, so about 10 vehicles," Burak explains. "Putting five in the North Island and five in the

South Island, going up to perhaps 20 as we continue to roll out."

Burak suggests users may not need to pay any more for the vehicle than a diesel-fuelled vehicle, and costs will likely be overall less.

"I don't expect that we should be charging the customers extra to be using one of these vehicles. In fact, the overall cost of renting and operating should be significantly cheaper."

Read our full review of the all-electric LDV EV80 in the last *EVtalk*, which can be found online at EVtalk.co.nz. You can see a full interview with Ed Burak and a tour of the motorhome at the *Auto Media Group* Youtube channel. ■

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Charging ahead BMW i3s

BY DAVE MCLEOD

The BMW i3 burst on to the market back in 2013. It was and still is, a five-door hatchback that boasts emission-free driving and futuristic good looks. The Mega City Vehicle is both practical and ultimately very driveable - so what's with the extra S in the new i3s?

Adding an S to a vehicle nameplate invariably means "Sport" and with the i3s, this is as true as it's ever been. Aside from the clever cosmetic tweaking that includes re-crafting the gloss black panelling, flaring the arches to cover the 20" alloys (F 175/55, R 195/50) and repositioning of the vehicle rear badging, BMW has widened the i3s's rear track by +40mm and the sports suspension has lowered it by +10mm too.

The i3s retains the same 94Ah/33.2 kWh battery packs (27.2 kWh usable), and the eDrive technology, but BMW have upped the power to 135kW and torque to 270Nm, resulting in a reported 0-100kph time of 6.9s and an overall power to weight ratio 9.4kg/kW - which, by the way, is a smidgen better than the BMW i8.

The cabin is racier too, still ultra modern and still full of natural materials, but now with aqua blue seatbelts and i3s badging. It comes loaded with both driving and sportscar-ilk aids, such as cruise and parking assists, new ASC with much quicker slip control, Dynamic Traction Control and a new Sport mode that has the i3s reacting quicker to driver inputs such as acceleration and steering.

As luck would have it, I



had a variety of things going on during my time with the Melbourne Red i3s, errands and events that would have me testing the \$85,900 BEV's range and "liveability".

Picking up the fully charged vehicle from Mt Wellington quickly had me immersed in reasonably flowing traffic that slowly nibbled at the bars of the easy to understand range meter displayed at the foot of the instrument cluster screen. By the time I had returned home after work at 6pm in Albany, I was two bars down. The next day promised plenty of kms, so I trickle charged back up to full which, according to the screen, would be completed by 11pm.

The following day's event (the launch of the new BMW M5) was held at Hampton Downs Motorsport Park and according to Google, meant a 1hr 7m/96.4km trek in a vehicle that when charged, forecasted 196km - yes the

i3s would apparently do it on one charge, but dicey to say the least.

The ride to the Motorsport Park was great. The i3s handles as advertised, it's quick, and the extra power comes into its own during overtaking manoeuvres (apparently it takes 4.3s to go from 80-120kph), quiet, comfortable, and very informative, especially the range forecast that you can't help but be fixated on as you go. I arrived at the racetrack with around 100km used so immediately hooked up to a power socket to trickle charge back up.

Following a morning of fossil fuel frivolity, plus 4+ hours of charge, I headed back off to the office (and then home) with enough juice to be carefree, which was in the region of 50km extra.

Checking the BMW i interactive map on the i3s's 10.25" infotainment screen, there was a Chargenet op-

tion in Pukekohe, so without the racetrack power, I could have detoured there, grabbed a coffee or two and been sorted - as it only takes 39 minutes to get to 80% charge from empty.

Not so bizarrely, my commute the next day was a polar opposite event. In the very heavy traffic, the i3s barely touched the range monitor and I arrived back home without the need to plug in, something I repeated the rest of the week - all the commutes being a joyful experience, tunes on loud, heated seats, AC full, I used it all.

This was one of those times where I managed to get a "real world" use out of the review and it gave me a better understanding of where we're at when it comes to EVs. Summing it all up. Around town and its surrounding areas, the i3s is most excellent. Plenty of power underfoot, sports styling, easy to manoeuvre and offers plenty of fun off the line, overtaking and in the twisties. However, longer runs still require forethought and planning, ample of time, or an additional \$7500 for a range extender. ■



Plugging in to a rental

BY RICHARD EDWARDS

Remember **Piri Weepu**? Former All Black, World Cup hero, star of the 'I've got this' meme, and now Maori TV television host.

When I stopped on Wellington's stunning South Coast to photograph Europcar's Volkswagen e-Golf on a boat ramp, Weepu and some mates pulled up wanting to drop their boat into the water.

But instead of hurrying me off the ramp, the affable Weepu began to ask about the car, showing genuine interest in the idea, and the appealing concept of not having to pay for fuel any more. It may seem an aside to this story - but interest from such kiwi bloke royalty in electric vehicles must be a

good sign, right?

Europcar has been supplying e-Golfs as part of its fleet since late last year, first as part of its Electric Day Pass scheme, and latterly as a paid for rental available to all customers. Pricing is reasonable - not dissimilar to renting a small SUV, and by the time you factor in that you don't need to pay for fuel, it is even more appealing. The need to stop and put \$6 worth of 91 into your rental after a day in Wellington - gone.

Staff will provide you with a ChargeNet fob if you need one. When was the last time your rental car came with a fuel card?

I wholeheartedly agree with Europcar's choice of the e-Golf for this job. Why? Because it is just a Golf. No flash tricks, unique styling or

ludicrous modes here - you jump in, push the start button and go, just like a normal car. There wasn't even the need for rental staff to brief me on the car.

That is not to say the experience is boring, the e-Golf is still an interesting drive for those not used to electric vehicles - it is a fantastic vehicle - but a rental car service desk is not the place for a learning curve.

For city work, and even some road trips, the e-Golf has plenty of range. You can get a reliable 200km out of the car and its 35.8kW hour battery. Need more? It DC charges at 40kW giving a 45 minute time to 80%. A full AC charge takes just short of 11 hours.

With 100kW and 280Nm on tap, the e-Golf takes just short of 10 seconds to get to

100km/h. Eco mode drops available power to 70kW and Eco+ to 40kW, reducing performance but increasing range. The e-Golf feels very planted on the road, corners flatly and rides well.

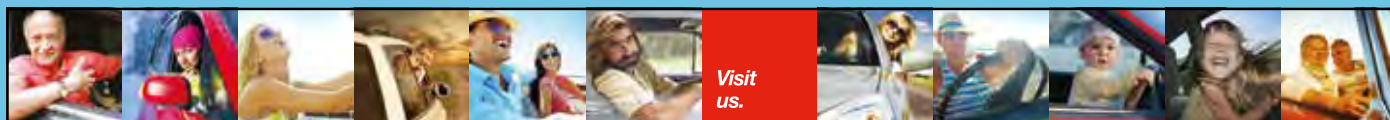
Inside, you get comfortable fabric seats with good space front and rear, a good-sized boot and a lot of creature comforts. Climate control air-conditioning is standard, as is smartphone mirroring on one of the two LCD screens. The main gauge cluster has been replaced by the second LCD screen, a great setup for providing the extra information an EV user may need.

To find out more about renting an e-Golf through Europcar, visit <http://www.europcar.co.nz/electric-vehicles> ■

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Houston Motors	Blenheim
Christchurch Mitsubishi	Christchurch
Caroline Mitsubishi	Timaru
Stephen Duff Motors	Dunedin
Balclutha Mitsubishi	Balclutha
Southern Mitsubishi	Invercargill

NEW EV CAR TYPES				
MAKE	MODEL	TYPE	PRICING RRP est.	APPROX RANGE KMS
BMW	i3	BEV	\$76,900	200 km
	i3s	BEV	\$84,300	200 km
Hyundai	Ioniq	BEV	\$59,990	220 km
	Ioniq Elite	BEV	\$65,990	220 km
Renault	Zoe 40 kWh	BEV	\$68,990	300 km
	Kangoo van	BEV	\$74,990	160 km
Tesla	Model S 75/100 kWh	BEV	\$121,395	350 - 540 km
	Model X 75/100 kWh	BEV	\$129,145	380 - 475 km
Volkswagen	e-Golf	BEV	\$61,990	220 km
Audi	A3 Sportback e-tron	PHEV	\$69,900	45 km + 600 km
	Q7 e-tron	PHEV	\$158,400	54 km + 800 km
BMW	i3 - Range Extender	PHEV	\$84,500	200 km + 130 km
	i3s - REX	PHEV	\$91,900	200 km + 130 km
	i8	PHEV	\$281,200	37 km + 400 km
	i8 2018 Coupe	PHEV	\$286,200	55 km + 400 km
	i8 2018 Roadster	PHEV	\$309,900	53 km + 400 km
	225xe	PHEV	\$69,800	41 km + 550 km
	330e	PHEV	\$91,600	40 km + 550 km
	530e	PHEV	\$136,400	50 km + 600 km
	740e	PHEV	\$202,700	48 km + 550 km
	X5 xDrive40e	PHEV	\$152,700	30 km + 800 km
Hyundai	Ioniq Plug-in	PHEV	\$53,990	63 km + 1040 km
	Ioniq Plug-in Elite	PHEV	\$59,990	63 km + 1040 km
Kia	Niro	PHEV	\$55,990	55 km + 850 km
Mini	Countryman	PHEV	\$59,900	30km + 500 km
Mitsubishi	Outlander	PHEV	\$60,990	50 km + 500 km
Mercedes Benz	C350 e Sedan	PHEV	\$96,400	31 km + 700 km
	C350 e Estate	PHEV	\$99,400	31 km + 700 km
	E350 e Sedan	PHEV	\$143,500	30 km + 600 km
	GLE500 e	PHEV	\$149,900	30 km + 700 km
	S500 e	PHEV	\$255,000	30 km + 700 km
Porsche	Cayenne S e-hybrid	PHEV	\$177,800	20 km + 750 km
	Panamera Turbo S e-hybrid	PHEV	\$428,400	30 km + 750 km
Toyota	Prius Prime	PHEV	\$48,490	50 km + 1000 km
Volvo	XC90 T8	PHEV	\$134,900	44 km + 600 km
	XC60 T8	PHEV	\$94,900	40 km + 600 km
BEV - Battery Electric Vehicle				
PHEV - Plug-in Hybrid Electric Vehicle				



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USED EV CAR TYPES

MAKE	MODEL	TYPE	PRICING RRP EST.	APPROX RANGE KMS
BMW	i3	BEV	\$40k - \$65k	200 km
Hyundai	Ioniq	BEV	\$52k - \$54k	220 km
	Ioniq Elite	BEV	\$59k - \$60k	220 km
Kia	Soul EV	BEV	\$37k	150 km
Mercedes Benz	B250 e	BEV	\$48k - \$49k	140 km
Mitsubishi	i-Miev	BEV	\$12k - \$15k	100 km
	B-Miev Van	BEV	\$12k	100 km
Nissan	LEAF Generation 1	BEV	\$10k - \$18k	120 km
	LEAF Gen 2 - 24 kWh battery	BEV	\$14k - \$28k	135 km
	LEAF Gen 2 - 30 kWh battery	BEV	\$23k - \$43k	180 km
	LEAF ZE1 - 40 kWh battery	BEV	\$53k - \$63k	250 km
Renault	e-NV200 van	BEV	\$21.5k - \$28k	140 km
	Zoe 22 kWh	BEV	\$26k - \$29.5k	220 km
	Zoe 40 kWh	BEV	\$43k - \$46k	300 km
Smart	Fortwo	BEV	\$20k	100 km
Tesla	S 75	BEV	\$118k	350 km
	S P85	BEV	\$97.5k	350 km
	S 90D	BEV	\$149k	420 km
	X 75D	BEV	\$145k	340 km
	X 90D	BEV	\$170k	410 km
	X 100D	BEV	\$159k	480 km
Volkswagon	e-Golf - 36kWh battery	BEV	\$60k - \$66k	200 km
Audi	A3 Sportback E-Tron	PHEV	\$50k - \$60k	45 km + 600 km
	Q7 e-tron	PHEV	\$130k	54 km + 800 km
BMW	i3 REX	PHEV	\$36k - \$72k	200 km + 150 km
	225xe	PHEV	\$50k	41 km + 550 km
	330e	PHEV	\$47k - \$77k	37 km + 550 km
	X5 xDrive40e	PHEV	\$140k	30 km + 800 km
	i8	PHEV	\$122k - \$168k	37 km + 400 km
Mercedes Benz	C350 e Sedan	PHEV	\$63k - \$85k	31 km + 700 km
	GLE500	PHEV	\$125k - \$130k	30 km + 700 km
	E350 e	PHEV	\$120k	30 km + 600 km
	S500 e	PHEV	\$96k	30 km + 700 km
Mini	Countryman Cooper SE	PHEV	\$66k	30km + 500 km
Mitsubishi	Outlander	PHEV	\$28.5k - \$35k	50 km + 500 km
Porsche	Cayenne S e-hybrid	PHEV	\$135k	20 km + 750 km
Toyota	Plug-in Prius	PHEV	\$18k - \$38k	26 km + 800 km
Volvo	XC90 T8	PHEV	\$130k	44 km + 600 km

BEV - Battery Electric Vehicle
PHEV - Plug-in Hybrid Electric Vehicle

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MICRO EVS



Electric Meg charges ahead with e-bike education

Electric Meg, aka **Megan Page**, loves promoting electric bikes – particularly for replacing commuter's cars and as a fleet option.

Her business, "electric-meg", lists her as an e-bike consultant, assisting with training or "work-place cycling enablement" and events, including consulting on health and safety e-bike policy.

Page is a qualified assessor and trainer, travelling the country to assist companies and organisations and getting more of their staff safely onto e-bikes. She's assessed and trained more than 2500 people.

That includes cycling projects such as Auckland Transport's adult cycle education programmes, Next-bike NZ, Bigfoot in schools Cycle Safety, NZ Transport Agency "Share the Road" workshops and school "Education Outside the Classroom" programmes.

The electric buzz runs in her family. Husband **Barry Page**, aka "Electric Bazza", does e-bike reviews.

Their two boys are into cycling as well, so they can have up to 16 bikes at home, and all enjoy mountain biking.

How did the Pages get into e-bikes?

Megan rode bikes from an early age in South Africa and, with Barry, did mountain biking there.

After visiting a family member in New Zealand, the Pages moved here in 1995. Barry was involved in

IT and Megan ran her own recruitment consultancy. She saw an Auckland Transport (AT) advertisement about a cycling programme in 2010 and became involved, later moving into contract work



Megan Page

for various cycling related organisations.

Her work was recognised with an AT Travelwise Supreme Award in 2017 in conjunction with Datacom. She was a finalist in two categories in the NZTA's national Bike To The Future Awards 2017.

Page specialises in e-bikes because she says they're suitable for a wide range of people and especially good for daily commuters.

"E-bikes expand your playground. You can travel further because you don't get as tired as you would on a push bike, and you can enjoy the ride more. You connect with your environment and with the people you meet along the way.

"I'm having a dream ride," she says of her full-time consultancy and operational

instructing work within the cycling industry.

Page says a sense of humour is important.

"It's about people," she says. "I'm not a professional cyclist and I don't look like a super cyclist.

"People look at me and think 'if she can do it then so can I'."

Page says e-bikes bring more freedom of travel to many, especially in getting to and from work or around other urban places. Fleet e-bikes are reducing companies' staff travel times for getting about the inner city to meetings and site visits, also cutting short travel taxi and parking expenses. There's environmental benefits too.

E-bike riders don't have to be super fit, obtaining a degree of fitness through pedal assist features.

Riders still need to pedal, but Page says an e-bike flattens the hills and makes it easier for people to get around. "You can travel on an e-bike in your normal work wear and you don't arrive a hot sweaty mess."

Her aim is to get people out of vehicles and into more sustainable transport modes.

"That can be for a number of reasons, which include helping the planet and your health."

She says some people who last rode as kids or who are new to riding are getting e-bikes as it's an easy entry into cycling.

These riders need to brush up their skills so they can have a better knowledge of what safe cycling entails.

Riding rules still apply.

E-bike riders need to be aware of the traffic around them – motorists and others sometimes underestimate an e-bike's speed. Riders need to stay safe and visible too.

"Choose safer routes which may not be the same as you would take in a car. If you have to ride on busy roads there are national guidelines."

Learn cycling etiquette and use manners when sharing the road or pathway. "It only takes one or two riders to ruin it for others," Page says.

If a rider feels unsafe they can become a pedestrian to cross a road safely – which you can't do in a car, she says.

Auckland's separation of cycle lanes from traffic is a great idea, Page says, which should be replicated in other main centres, encouraging more people to commute on e-bikes.

"Electric bikes were traditionally viewed as a bit clunky and only used by those who weren't 'proper' cyclists," she says. "Now they're sexy beasts, with a wider range available."

"Once people have tried an e-bike they're hooked on it. It's practical to use and also super fun."

Page has an Onya e-bike, but she gets to ride different brands and models.

She says e-bikes are hugely popular, with purchasing demands increasing.

"We're evolving," she says. "And I'm pleased to be part of that change." □



MICRO EVS



Darren Keen.



The Scooter Safari.

A good, keen e-scooter man

Darren Keen has just proved a Niu electric scooter can do 250km with a few battery swaps.

The South Island's sole Niu agent, Dunedin's DK Motors managing director completed the Scooter Safari ride from Christchurch to Hokitika in about six hours ride time.

"We were the first electric scooter to enter and the first to complete the event," Keen says.

The coast-to-coast endurance ride was fundraising for the New Zealand Cancer Society, Keen's team raising \$3180 towards the event total of nearly \$330,000.

Rather than charge the Niu scooter along the way, Keen says they did five battery swaps instead. "We could have done less if we'd swapped when the battery ran out, but we stopped when the other scooters stopped for fuel in the spirit of the event."

Keen says the total ride took about 10 hours, leaving Christchurch at 8am and arriving in Hokitika about 6pm, including at hour's break for lunch plus stops every 50km or so.

The weather was good up until about Arthur's Pass with rain, wind and cooler temperatures through to the finish.

Many rode in fancy dress, from

Santa Claus on sleighs to Crusaders.

"My bike gear kept me warm," Keen says. "And with the quietness of the electric scooter I was able to listen to music on my iPhone for five-and-a-half hours."

On the flat, the Niu and other scooters among the 271 on the safari were even paced, all generally limited to 50km/h. But on the uphill sections of the Porters and Arthur's passes the electric came into its own.

"I passed some on the Porters Pass and then just about all of them on Arthur's Pass,"

Keen says.

He says the carburettors on the petrol-powered scooters didn't handle the steep climb at altitude, mainly through oxygen starvation, whereas the Niu "didn't miss a beat".

Would Keen do it again? "Yes, we're considering doing the Scooter Safari in 2020."

Meanwhile, he has another challenge in mind.

Keen says they're talking about riding the Niu from Bluff to Cape Reinga on a Leading the Charge type tour.

"But I might have to register the Niu as a motorcycle so we can go faster," he says.

"We'd be looking to do the trip in four days." □



Darren Keen at DK Motors in Dunedin.

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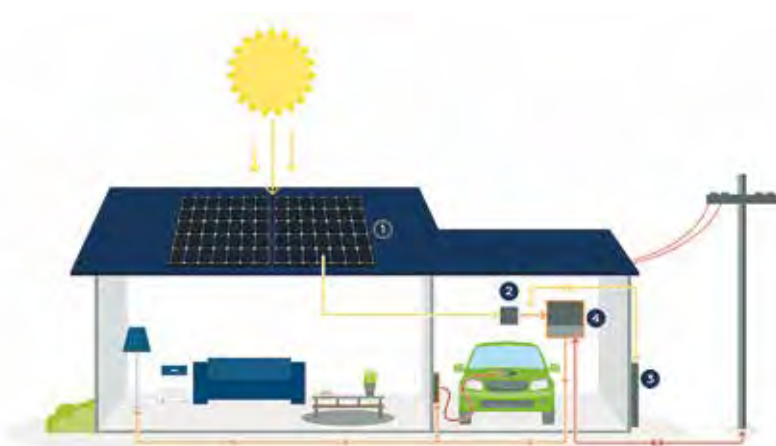


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Powering up for the future

Going full circle - how to get the most out of your EV

Early adopters of electric vehicles (EVs) in New Zealand are already reaping the benefits of lower running costs.

There are also government perks like exemption from road user charges, and the feel-good factor from knowing you're responsible for zero tail-pipe emissions

But there are even more ways to benefit from your investment when you throw in a residential solar and battery system to close the circle on personal energy and mobility freedom.

The trick to choosing the right sized solar solution

The trick is to get the right sized system so that, on average, you're generating enough power to meet your needs, without spending extra on more generation or storage capacity that would seldom be used.

Owning an EV helps that equation. An EV will increase your household electricity use because you'll more than likely do most of the charging at home. Adding extra demand for electricity means you have more to gain from a solar and battery system since you can scale up the system capacity to cover that increase.

Getting a correctly sized solar and battery system is critical. It does need to be tailor-made for your house, your EV, and your electricity use patterns. A domestic battery helps you get more out of your solar installation by enabling

your EV to be charged when it's convenient to you, rather than just when the sun is shining.

Charging technology is only getting smarter

Some retailers are already offering off-peak rates for charging EVs overnight. This is just the start of all sorts of new developments that are set to unlock further potential to benefit from your EV.

Vehicle to grid chargers are available overseas that turn your EV into a mobile battery capable of powering your home. Think about it like having an extra battery available for your solar

Some retailers are already offering off-peak rates for charging EVs overnight. This is just the start of all sorts of new developments that are set to unlock further potential to benefit from your EV.

panels and the equation for maximising your investment gets even more interesting.

Already the battery capacity in a Gen 230kWh Nissan Leaf is capable of powering your home for about 10 hours.

Not going in to work one day or staying in on the weekends? You could suddenly have enough power to work from home for the day just by leaving your car plugged in.

Or, your local network company could offer you preferential rates for charging your EV in exchange for giving them the ability to dynamically integrate your car's spare battery capacity with the

local grid, via smart two-way chargers.

As battery capacity increases and more EV models become available in New Zealand, the options for integrating residential solar and battery systems with EVs are only going to increase.

Dollars and sense

Aside from the investment maximisation that's possible at an individual level, it's also about managing the transition to a world where EVs are common place and our national electricity generation is providing the extra power needed through low-carbon sources, in addition to the mainstays of hydro, wind and geo-thermal.

Every slow charger (7kW) for an EV adds the equivalent of 2.8 houses to the grid, while every fast charger (22kW) adds nearly nine houses.

As the number of chargers in New Zealand grows, this is going to mean adding whole suburbs' worth of capacity to the local electricity network. Over time we'll all pay for the network upgrade to cope with the increased charging load.

Adding a solar and battery system means you're reducing the need for that network upgrade because you're helping supply the extra electricity needed right from your rooftop. ■



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Electric addition makes wheelchairs zoom

You've heard of electric bikes – now there's electric wheelchair "trikes".

Yes, electric power assist is available for wheelchair users to get them where they want to go – quickly and without muscle stress.

RGK New Zealand, run by **Brendon Stratton** and **Scott Robertson** from their office in Takapuna, Auckland, offers electric power assist attachments for wheelchair users.

They can help people go further and faster and are suitable for footpaths, cycleways, and even off-road in some cases. Speeds are limited to under

35km/h, but Stratton reckons most would do about a 25km/h top speed, depending on weight and terrain.

Stratton, a paraplegic since the age of 14 after a car crash, has a customised electric attachment for his own use. A world-class athlete in handcycling and a wheelchair basketball coach, he gets around.

Before his accident, Stratton was also a world-class BMX competitor, rated No 4 in New Zealand for the 14-year boys 20-inch class. He was a month away



Brendon Stratton, left, and Scott Robertson.

from attending the BMX world championships in Florida when the crash occurred.

Not one to let such things get in his way, Stratton has been competing since 2012 and does a lot of mountain biking (handcycling), especially in Woodhill Forest. He's also been in some of the most

gruelling cycle challenges around, like the 100km K1 Coromandel to Tairua ride and the 160km Lake Taupo Cycle Challenge.

Continued on page 29

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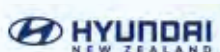
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Connected Vehicles

AI's \$54b potential in New Zealand

Artificial Intelligence (AI) has the potential to increase New Zealand's GDP by up to \$54 billion by 2035.

That's according to a major study - *Artificial Intelligence: Shaping a Future New Zealand*.

Released by the Artificial Intelligence Forum of New Zealand (AIFNZ), the report is the culmination of nearly a year's work with research partners IDC and Sapere.

It studies the local and international AI landscapes and the potential impacts on New Zealand's economy and society.

The report identifies key opportunities in which New Zealand can invest and says this country seriously needs a national AI strategy to keep up with global technology changes.

AI is used, for instance, in driverless vehicles and new vehicle technology across most transport forms.

New Zealand has a young and growing AI ecosystem, the report shows. However, major AI investment by other countries around the world raises challenges for New Zealand to keep up with global AI advancement.

AI and automation frees people up to focus on more complex, higher value tasks in their jobs. It may also help address potential labour shortages and the challenge of an ageing workforce.

The report also explores the challenges that AI presents for our society; for jobs, the law and new

ethical considerations. There are long term implications for core legal principles like legal responsibility, agency and causation. AI raises many new ethical concerns relating to bias, fairness, transparency and accountability.

Recommendations include establishing the strategy, assisting with AI adoption, adapting to AI effects on law, ethics and society, increasing data accessibility and creating an AI talent pool.

An action plan and ethical framework is urgently needed to educate and upskill people on AI technologies,



government digital services and broadcasting, communications and digital media minister **Clare Curran** says in launching the report.

"An ethical framework will give people the tools to participate in conversations about AI and its implications in our society and economy," she says.

"As a first step and because of the importance of ethics and governance issues around AI, I will be formalising the government's relationship with Otago University's NZ Law Foundation Centre for Law and Policy in Emerging Technologies.

"There are economic opportunities but also some pressing risks and ethical challenges with AI and New



The report identifies key opportunities.

Zealand is lagging behind comparable countries in its work in these areas.

"With many other countries already focusing on the strategic

development of AI, New Zealand must be at the forefront of AI adoption as we strive to compete in the global marketplace.

Curran says the report shows New Zealand has a small but flourishing AI sector, with innovative systems rapidly evolving at all levels.

"We must prepare for the ethical challenges AI poses to our legal and political systems, as well as the impact AI will have on workforce planning, the wider issues of digital rights, data bias, transparency and accountability are also important for this Government to consider.

"This report creates an opportunity for business, government, academia and

all Kiwis to join the AI conversation. Coming together to develop the right support and frameworks to grow our AI expertise will be critical to shaping our future."

AIFNZ executive director **Ben Reid** says the report has received considerable media coverage and stimulated debate on social media.

He says the forum is gearing up for the next phase.

"We will be establishing several new workstreams to help deliver the report's recommendations, working with private, education and public sectors."

Meanwhile, New Zealand AI hosts its second Create AI workshop for business leaders on June 15 at the Auckland University of Technology, 8.30am-12.30pm. The topic is "conversational AI" and includes a panel discussion.

Visit www.aiforum.org.nz for more information. ■



INTELLIGENT TRANSPORT

Connected Vehicles

Transport tech a feature of Techweek'18

The talk was all tech for a week in May, especially around transport.

Techweek'18 from May 19-27 featured about 500 events during the annual festival of innovation held throughout New Zealand.

All things from artificial intelligence (AI) and the Internet of Things (IoT) which can apply to transport, through to autonomous vehicles and drones, were included.

Prime minister Jacinda Ardern set the pace in what was considered a world first by appearing as a hologram to open the event on May 21 in Auckland.

"We're on the cusp of a transport revolution," says the NZ Transport Agency which hosted an informal panel discussion on the role of technology in the transport sector on May 23.

The NZTA's work on mobilityOS is about giving customers choice and connecting people to transport options using the tech already in their pockets.

Damien Le Breton has the interesting title of NZTA incubation senior manager. He provided some insights into the "mobility marketplace" during his talk at the NZTA's new Innovation Zone



Damien Le Breton

in Cook St, Auckland.

The Innovation Zone aims to develop ideas through workshops, "hackathons", experiments, brain-storming and more.

Le Breton says during restructuring last year the NZTA changed the way it deals with customer groups and others with more emphasis on how transport relates to people.

"We help-people do the things they want to do in getting from 'A' to 'B'," he says.

Le Breton says that can mean how people get from one side of Auckland to the other using technology to help.

"My job is to investigate

that technology and see what role it has to play in transport.

"It's more about people, not the tech - which is the means."

Le Breton talked about mobility as a service and the "mobility marketplace".

He says transport is not just public transport but includes ride sharing, taxis and other forms.

An app such as RideMate offers real-time transport options to help people get where they want to go in Auckland.

A wealth of information is now available to help people with a transport decision.

People can see if a transport service is sustainable,

for instance, and make a choice, Le Breton says.

He says any transport provider can be part of the "mobility marketplace". "They just need to be legally compliant and up to date with the tech."

Queenstown has a similar app called Choice.

Aware Group chief technology officer **Jourdain Templeton** explained how his Hamilton-based group made data more usable.

His team called "Licence Me" won the Techweek'18 hackathon at the Innovation Centre by proposing to incentivise safe driving behaviour in teenagers on restricted licences.

Techweek'18 also covered driverless vehicles at the Christchurch Innovation Expo on May 21, along with cycling sentiment.

Those involved in the 2018 LINZ Virtual Field Trip for Students on May 22-24 tried a self-driving vehicle like the Ohmio Hop and saw how satellite positioning helps.

Events were hosted in 36 towns and cities, simultaneously in many cases.

Visit <https://techweek.co.nz/> and Mobility.Marketplace@nzta.govt.nz for more information. ■

EVtalk

Keep up with the Electric Vehicle industry news www.evtalk.co.nz

New laws needed for driverless vehicles

A complete overhaul of law and policy around driverless vehicles is required, says the author of a comprehensive legal study.

Law reform specialist **Michael Cameron** spent more than seven months on investigations for his book, *Realising the Potential of Driverless Vehicles for New Zealand*.

The Government's advice and legislation legal manager won the New Zealand Law Foundation's International Research Fellowship for 2016. This is New Zealand's most valuable legal research scholarship and enabled him to take a sabbatical to produce the book for the foundation.

He says we can afford to take time to get the overhaul right. But, in the meantime, some targeted reform is needed more urgently.

"Certain types of driverless vehicles, such as the taxi fleets being deployed by General Motors next year, may find it difficult to be allowed on New Zealand roads, regardless of how safe they are," Cameron says.

"Law change to reduce this uncertainty is desirable soon if New Zealand wants to ensure the life-saving benefits of driverless technology are not needlessly delayed."

Cameron says timely and targeted reform would be essential if New Zealand is to have a chance of becoming a leader in driverless technology, with resultant benefits.

He says North Island rocket testing and the Zephyr Airworks "Cora" autonomous air taxi trials in the South Island show the country can contribute to world-beating technology.

"But only if we have receptive laws."

The safety of all road users will ultimately be improved by full adoption of the new technology, he says.

Cameron's book identifies key law reforms needed for the smooth introduction of driverless vehicles, as well as counterproductive law changes he says shouldn't be made.

Rules around actually needing a driver in New Zealand are a little obscure, for instance.

Cameron reckons that should be clarified for starters. "It could be changed to say that you don't need a driver – just to be clear.

"Many rules have the assumption that there is a driver. The Geneva Convention on road traffic, which we're signed up to, says vehicles should have drivers.

"There should be a clear statement that there is no requirement for a vehicle to have a driver, in order to give some clarity."

Law changes are needed to clarify liability for offences involving driverless vehicles, such as speeding or illegal parking. Other issues include regulation of testing, cybersecurity, mandated vehicle connectivity, radio spectrum use, urban planning, special lanes and reserved roads, privacy, parking and ethics.

Cameron says there's no systematic process for assessing autonomous vehicles (AVs) coming onto the roads as safe.

He favours Australian moves around such things, like setting up organisations to approve or decline AV applications.

"It would be difficult for an agency to acquire enough expertise and information to

be able to make a positive decision to approve a vehicle as safe, and so they are likely to end up declining vehicles that are safer than human driven vehicles."

Cameron says it's better to follow some procedures adopted in the US – he visited both countries during his study.



Michael Cameron, right, congratulated by NZ Law Foundation chairman Andrew Butler.

He says US driverless vehicle manufacturers are expected to provide a safety assessment, for instance.

"They provide an assessment and if the Government has concerns it can pull them off the road under existing powers, such as through recall powers."

Cameron says if we want New Zealand to have a chance of being involved in the development of driverless vehicles and to have the jobs and economic growth that goes with that, then New Zealand law has to be receptive towards driverless vehicles. One of the main reasons for Zephyr Airworks choosing to develop its autonomous flying taxi in New Zealand was the receptivity of our laws.

He says an increasing number of modern vehicles are incorporating automated and autonomous functions.

"We need some oversight on the safety of AVs, Cameron says. But he doesn't want to see unnecessary delays caused in deployment either.

He points to the example of the 2017 Audi A8, which has all the hardware for driverless functionality but could not be approved for sale in Europe (and by extension to New Zealand either) with the driverless software installed. This was not because of any assessment that the vehicle was unsafe but because it

was not possible to approve it under the European standards, regardless of how safe it was.

"We shouldn't have laws needlessly stopping these types of vehicles.

"Everyone is trying their best to make roads as safe as possible. But attempting to eliminate the road toll by elimi-

nating human error is an impossible task. People will always make some mistakes."

Cameron says there is a common misconception that driverless vehicles need to be able to "talk" to each other and share information to operate safely and effectively. This leads people to make the mistake of thinking that having a mix of driverless and human driven vehicles on our roads at the same time would be a disaster because human drivers would not be privy to such communications.

Driverless vehicles may well be able to talk to each other in the future and coordinate their movements, and this would make even more beneficial. But, in the meantime, they will be able to drive safely simply by relying on the information coming in from their sensors plus mapping data and GPS.

And concerns about "robot bullying", where human drivers see an autonomous

Continued on page 25



AUTONOMOUS VEHICLES

The future of transportation

Stantec Transportation senior vice-president Rod Schebesch has spent his career designing and building transportation infrastructure. As a regional business leader in western Canada, he builds teams to pursue and deliver transportation infrastructure projects. He was involved with projects like Active Aurora, Canada's largest CAV test bed, to design and construct tomorrow's intelligent transportation systems.

Evolving our modern day means of transportation has long been the mission of urban planners and transportation groups around the globe.

Electric vehicles, advanced light rail transit, bike lanes - we are actively seeking ways to enhance transportation services for the clients and communities we serve.

The challenge? Increasing travel ease while decreasing congestion and minimising our environmental footprint.

Lately, much of the discussion has shifted to the research and development of autonomous vehicles (AVs) and connected vehicles (CVs).

Autonomous Vehicles:

Otherwise known as the "driverless car", AVs are capable of driving themselves and do not require a human driver to function.

Connected Vehicles:

These function are off a connected network that facilitates knowledge sharing between vehicles, other vehicles, and the traffic infrastructure around them. Examples of knowledge sharing can include traffic lights, roadside incidents, speed limits, and road conditions.

So far, no one has really been able to implement a fully-connected AV network. However, China is coming close with aggressive targets for implementation. New Zealand is also near to realising the future of transportation.

I had the opportunity to travel down to Auckland and Queenstown, and speak about the recent developments in the transportation industry. I found the sup-



Stantec Transportation
senior vice-president
Rod Schebesch

portive, forward-thinking communities there to have a progressive appetite for innovative ideas, particularly plans that promote environmental sustainability. I discussed several items with community leaders and stakeholders:

- Trials
- Self Driving Shuttles
- Trends in Smart Mobility
- Policies

New Zealand is still a predominantly rural nation, meaning many vehicular accidents occur in the countryside. A connected vehicle network could help to alleviate this problem. How? By notifying the driver if they are travelling too fast for the road, communicating road conditions, highlighting high-risk areas, and providing insight from vehicles that have passed through that area before.

This detailed information facilitates a fully connect autonomous vehicle (CAV) network, which helps us alleviate traffic time and reduce accidents.

Making the move

Governments need to

begin thinking about the transition towards CAV networks. Some possible starting points?

We could look at how connected technology might be able to help reduce crash rates at specific problem sites.

The focus could initially be on getting information to drivers via phones, apps or variable message signs. We could also fit out the vehicles of regular users of routes through known trouble spots with connected vehicle technology that initially focussed on the anticipated problems.

This approach could bring about earlier reductions in the road toll.

If we wanted to address congestion and energy issues we could begin with self-driving shuttles? Also referred to as shared autonomous vehicles (SAVs), self-driving shuttles are great for enhancing transit through the "first mile" and "last mile" of a transit trip.

The first mile: Represents

Continued from page 24
vehicle and think that if they pull out in front it the AV will automatically stop, are overblown. "If people perform illegal manoeuvres then they will be on film (taken by the AV), with the recording able to be sent to police."

Cameron says his book as been a "big task", start-

the time it takes a commuter to get from their home to their desired form of transit (ie, the walk from home to the bus stop).

The last mile: Refers to the final leg of a trip (ie, the walk from a transit terminal to the office).

SAVS can also encourage greater density through a flexible shared vehicle that requires little infrastructure. They are very well suited for college campuses, business parks, senior developments, and resort locations.

Deploying CAVs requires partnerships between governments and the private sector. It will be a gradual transition—and it's just starting now.

As the transportation industry moves towards CAVs and electric vehicles as the preferred energy source, our mobility choices and streets will look much different than they do today.

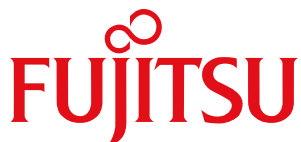
Rod Schebesch was a key speaker at the T-Tech Conference in Auckland in March. ■

ing the project in March 2017 and submitting the manuscript in February this year.

It's available from Unity Books and online, through the law foundation website and Amazon.

Visit www.lawfoundation.org.nz/?page_id=2568 for more information. ■

WE'RE COMMITTING TO EVs



We're seeing how some of the New Zealand companies are doing with their commitment to electrify at least 30% of their vehicle fleets by 2019. ABB is among 30 of the country's employers to agree on the deal.

ABB is adding the "E", as in electric charging

We're seeing how some of the New Zealand companies are doing with their commitment to electrify at least 30% of their vehicle fleets by 2019. Auckland based ABB is among 30 of the country's companies who committed to convert.

A technology leader in industrial digitalisation, ABB is making good progress on its commitment to electrify its fleet.

So says ABB New Zealand managing director **Ewan Morris**.

That's despite it experiencing a similar situation covered by The Warehouse Group in our May issue where lease pricing can be high, mainly because high depreciation rates on new EVs are passed through into monthly leasing costs.

ABB is the global market leader in sustainable e-mobility infrastructure. It covers the entire value chain of charging infrastructure, from integrating renewable energy into a robust grid to the charging station installation.

Like The Warehouse Group, ABB is also looking to have EVs brought from countries such as the United Kingdom, where subsidies and other benefits can be passed on, and ABB says it would work with fleet leasing companies to do this.

While ABB has electrified a few of its small fleet of pool cars, it is still working on replacing lease cars used as tools of the trade by company representatives.

Morris says it often comes down to EV availability and affordability.

Plug-in hybrids, for instance, have been promoted to sales staff as a way of overcoming range issues as

many sales staff, for example, do significant mileage.

Morris says ABB New Zealand is dealing with global supply chains like GVI to see if it can standardise vehicles

ABB has been established here more than 80 years and employs about 500 people across 11 sites nationwide.

In addition to sales and service locations, ABB has manufacturing facilities in Henderson, West Auckland, and in Napier.

ABB has gone to the market to evaluate the costs and availability for EVs.

The company is investing EVs for fleet heavy service vehicles too, particularly large vans.

ABB recently signed a third party channel agreement with Singer Group Ltd in New Zealand.

Singer will deliver services for ABB's EV charging portfolio here which includes site inspection, procurement, supply, installation, commissioning and ongoing maintenance. As a channel partner, Singer will also serve as a certified service provider for ABB's single- and three-phase uninterruptible power supply (UPS) products, and solar inverters.

The aim is to simplify customers' access to the extensive range of electrification products (EP) including low and medium-voltage products, solar inverters,

UPS and power conditioning products and EV charging infrastructure.

Morris says the range of EVs becoming available is growing rapidly.

"People can now get some pretty grunty stuff in EVs, like the Jaguar I-Pace and the Audi e-tron," he says.

Morris believes EV uptake will continue at a high level in New Zealand, particularly if the coalition Govern-

ment helps with incentives. "This Government may be more interventionist than the previous Government in that field," he says.

A regional fuel tax applying in Auckland from July 1 may be another shot in the arm for people to move to EVs, Morris says.

Technology development is addressing charging needs.

ABB has recently launched its Terra High Power fast-charging station at the Hanover Fair.

The Terra HP is reportedly the world's fastest EV charger, adding up to 200km of range to an EV in just eight minutes.

German chancellor **Angela Merkel** and Mexican president **Enrique Pena Nieto** visited the ABB exhibit to hear from ABB chief executive officer **Ulrich Spiesshofer** about the impact the new charging technology will have on sustainable transport.

What started as a small

start-up in one of ABB's business units almost a decade ago is now an integral part of the company's innovative push for sustainable mobility.

With more than 7000 DC fast charging stations installed in 60 countries, ABB is a global leader in that segment.

ABB has a heritage spanning in excess of 130 years and operates in more than 100 countries, employing about 135,000 people.

It's become a leader in digitally connected and enabled industrial equipment and systems with an installed base of more than 70,000 control systems connecting 70 million devices.

In the United States, ABBs chargers were selected for deployment by Electrify America, which plans to place hundreds of charging stations within and around 17 metropolitan areas and along multiple nationwide highway corridors.

ABB's charging technologies for electric cars, buses and trucks, as well as solutions for the electrification of ships, railways and cableways, firmly establishes it as a global champion in e-mobility and sustainable transportation.

The company's partnership with the ABB FIA Formula E Championship is also bringing its name, innovation and technology leadership to the first fully electric motor sport series. ■



Ewan Morris

Electrification jolts vehicle industry towards wider revolution

A shift from petrol or diesel powered to electric vehicles is at the heart of a rapid and radical revolution in personal transport that will have significant effects on New Zealand society.

Kiwis have grown attached to their cars but the world is changing fast and this country is no exception.

The way cars are powered, driven, used and even bought and sold is changing. It's already happening. The vehicle industry is being turned on its head.

Electrification

Vehicles have always been powered by an internal combustion engine, either petrol or diesel. Climate change and regulations to counter its effects, requiring fewer or zero emissions, are effectively driving the electrification of the motor industry.

Toyota New Zealand has set a goal of 30% reduction in emissions by 2030; Toyota globally is aiming for a 90% reduction by 2050. A core strategy to achieve these goals is electrification.

As an example, Toyota and Lexus' self-charging electric hybrid vehicles, which started with the Prius, have been around for 20 years and now include Camry, Corolla and most of the Lexus model range. Those options reduce fuel costs and carbon footprint by as much as 30%. The newly released plug-in electric Prius Prime saves a further 30-50%. Every Toyota and Lexus model will have a plug-in or hybrid version by around 2025.

Oil will eventually become less valuable as the de-

mand for it reduces, leaving stranded assets for some economies. But then there is the potential problem of how to produce electricity cleanly. Hydro, wind and solar production are all expected



By **Alistair Davis**, Toyota New Zealand chief executive officer and managing director. Davis is also chairman of the Sustainable Business Council.

to grow as the demand for electricity to meet motoring needs hits national grids.

While we can't calculate the exact impact on national grids and charging infrastructure, we can say that pipes and surge demand may be challenging and investment of infrastructure is a must.

New Zealand is well served with renewable electricity capacity, but much of the rest of the world is not. Toyota and some other companies are exploring producing electricity from hydrogen, which may be the best long-term outcome.

Self-driving vehicles

If you think self-driving vehicles are a long way off, think again. Much of the technology is in existing models, and trials and some use of these vehicles are already underway.

Predictions are that autonomous vehicles will deliver a massive reduction in accidents. It won't be perfect, but it will be a thousand-fold improvement over the human drivers who cause most accidents. Changes in the insurance

and health industries will result.

These vehicles will also transform the lives of many, such as those who can't self-drive and workers who will suddenly find their

commuting time becomes productive and commuting from suburbs less stressful.

Much of the autonomous technology involved, like active radar cruise control, lane departure warning, blind spot monitors, pre-crash safety systems and autonomous braking, are already in many Toyota and Lexus models.

The next steps are joining these technologies to provide a seamless driving experience where drivers can choose to enjoy driving (with guardian angel technologies to help when necessary) or let the vehicle do much of the work. As these technologies evolve, we'll see increasingly sophisticated autonomous vehicles.

Mobility as a service

Changing habits in large cities are seeing fewer young people owning vehicles and more dependence on "mobility as a service" (MaaS) options, like Uber.

Car sharing will become more sophisticated as technology develops and numerous business models are launched. This industry will only grow – and fast.

MaaS is developing con-

stantly with tie ups between manufacturers and rental companies/Uber and other similar operations. Toyota has just inked an arrangement with the Avis/Budget Group in North America, for instance.

In New Zealand we have invested through Toyota Financial Services in a Wellington-based car sharing software company Mindkin. Trials are already underway in Auckland, Wellington and Palmerston North.

The combination of MaaS and autonomous vehicles could change urban planning with less requirement for car parking and potentially less road investment. Having more vehicle sharing will mean fewer cars on the roads and therefore have an impact on climate change as well. Toyota is investing in mobility for all with robot and AI technologies for helping the disabled get mobile.

Buying and selling

New vehicles will be increasingly sold online and dealers will evolve into service centres and used vehicle hubs.

Changes such as Toyota's Drive Happy Project, will see all our dealerships become stores designed to meet the needs of modern customers.

We are looking at removing concerns such as price haggling, short test drives, on-road and service costs, lack of online detail for decision making and even 'buyer's remorse'.

From electrification to how vehicles are bought and sold, these are all changes all will impact on the next 100 years. ■

Leaf lifts EV numbers

May was the biggest month ever for the Nissan Leaf with 338 registered in New Zealand.

That's helped electric vehicles pass the 8000 target for this year six months early.

In fact, 8184 electric and hybrid vehicles were recorded by the Ministry of Transport by the end of May. That confirms a comment made at the Drive Electric white paper launch on May 29, reported in *EVtalk*, that EVs had gone beyond 8000.

The 8184 EVs comprise mostly used light pure electrics at 4434 – up 359 on April, which includes the Leafs.

New light pure electric comprised 1550 vehicles – up 75 on the previous month, while new light plug-in hybrids were 71 up at 1486.

Used light plug-in hybrids recorded 632 – 68 up, and heavy EVs remained the same as for April with 82.

The 8184 figure is more than double the 3654 EV fleet size recorded last May.

The fleet is expected to double each year, with 16,000 set for the end of 2019.

That puts New Zealand well on track to reach the Government's goal of 64,000 EVs on our roads by the end of 2021. ■



The Nissan Leaf.

NEW MAKES AND MODELS MAY 2018		
MAKE AND MODEL		TOTAL
ELECTRIC		
HYUNDAI IONIQ		52
VOLKSWAGEN GOLF		16
TESLA MODEL S		4
BMW I		1
FORD FOCUS		1
PLUG-IN HYBRID		
HYUNDAI IONIQ		32
MITSUBISHI OUTLANDER		19
TOYOTA PRIUS		17
MINI COUNTRYMAN		6
KIA NIRO		3
BMW I		2
VOLVO XC60		2
BMW 3 SERIES		1
AUDI Q7		1

USED IMPORTS MAY 2018		
MAKE	MODEL	TOTAL
BEV - BATTERY ELECTRIC VEHICLE		
NISSAN	LEAF	337
NISSAN	E-NV200	5
BMW	I3	3
MITSUBISHI	I-MIEV	3
SMART	FORTWO	3
RENAULT	ZOE	2
MERCEDES-BENZ	B250	1
NISSAN	NV200	1
TOYOTA	PRIUS	1
PLUG IN HYBRID		
TOYOTA	PRIUS	20
MITSUBISHI	OUTLANDER	18
BMW	I3	6
MERCEDES-BENZ	C350	2
BMW	330	1

Electric addition makes wheelchairs zoom

Continued from page 20

It was among all this Stratton realised people from children to senior citizens using wheelchairs often needed more help with mobility.

He started RGK New Zealand in 2005 with Robertson, both also involved since 2004 in IT recruitment company High Street IT.

RGK offers a variety of makes and models, particularly from Italian brand Triride which has about seven models. These are customised, targeted to needs and budgets from a standard connection to off-road devices, Stratton says.

They easily turn a standard wheelchair into a motorized wheelchair or a lightweight, compact and powerful electric scooter.

"We can configure these to suit the customer," he says.

The Trirides also offer a regenerative braking system - IBS intelligent braking systems.

Weight is often a critical factor for wheelchair users, and the Triride range starts at 7.5kg, with the heaviest 12.5kg, including a battery.

The Firefly, by Rio Mobility, is 10.5kg including the battery.

The lighter weights make the power attachment easier to get in and out of vehicles, usually unclipping in seconds.

"That's important for people who may not have much body strength," Stratton says.

The power assists have a range varying from 35km to 100km, depending on the product, the individual and the terrain. The lithium battery recharges in about three hours and 45 minutes from empty.

Stratton says it's the ability to customise which is important, done in Italy where even a colour match can be provided.

All models feature advanced functions, including electronic brake operated by lever, reverse gear, cruise control, electronic-assisted lifting for the wheelchair's front wheels, "Normal" and "Sport" modes, five speed levels and more.

An entry-level power assist comes from USA-based Rio Mobility, which provides the Firefly attachable full power handcycle.

The Firefly doesn't offer the same flexibility and customisation as Triride, but Stratton says it's useful for those seeking a lower cost device for use in an urban environment.

Another is Quickie Attitude which also provides a power

assist.

Stratton says power attachments like Triride's may take about an hour to first set up, but then only require seconds to later add or remove.

He uses a Triride high powered attachment to do a lot of chores.

Trirides can have their torque configured to suit individual needs.

Stratton says he was initially against having power assist for himself. "But I found it amazing – it allows you to do so much more."

Until a few years ago, power assist was not as viable. But advancing technology has made them far more useful, Stratton says.

Search for RGK NZ on Facebook or contact Brendon Stratton on 0274 660 048, or Scott Robertson on 0274 322 489. ■



EV TALK DIARY

EVtalk New Zealand editor
Geoff Dobson looks at the month
gone by on www.evtalk.co.nz



May 1

EVworld NZ Champions Awards now open

The EVworld NZ Champions Awards nominations are now open.

The awards honour individuals, businesses and communities associated with electric vehicles (EVs).

They will be presented at an evening function on August 9 at the ASB Showgrounds in Auckland at the opening of the EVworld NZ event from August 10-11 at the same venue.

May 4

Plug-in electric boat launched in Tauranga

The first Kiwi built plug-in electric boat has been launched on Tauranga Harbour during a public display.

Tesla car batteries drive an electric motor, making the boat quiet, pollution free, and providing buyers with long-term value for money, developer Sean Kelly says.

Kelly says interest in the battery-powered boat has come from Australia as well as around New Zealand.

May 9

Kia Niro EV arrives early 2019

The Kia Niro EV is due here early next year.

And the all-electric version of the Kia Niro SUV is expected to have a 380km range.

Kia New Zealand has confirmed interest in bringing the new Niro EV into New Zealand early next year.

May 11

Evoke electric motorcycles coming here

Beijing-based Evoke Electric Motorcycles is bringing its electric bikes to New Zealand this year.

It has just announced a dealership here has been signed, trading under Evoke Motorcycles New Zealand.

"Kevin and Linda Harty have shown great enthusiasm in their desire to bring electric mobility to New Zealand and we are very happy to be partnering with them," Evoke's sales vice-president **Sebastian Chrobok** says.

May 15

Load ranger – we test the LDV EV80

Commercial vehicle operators are pretty savvy. In their world, long-term operating costs can trump initial purchase price. They rarely operate on passion when it comes to their vehicles – they want numbers on a spreadsheet.

They also better understand their vehicle use, unlikely to resist a short-range vehicle because the annual run to the ski field may become slightly trickier.

Which will make them a key market for electric vehicles – and the distributors know it.

Leaf 30kW battery response awaited

Previous hard use or continued rapid charging may have contributed to reported battery degradation issues identified by Flip the Fleet in the Nissan Leaf 30kW electric vehicle.

So says Imported Motor Vehicle Industry Association (VIA) chief executive officer David Vinsen in a Radio New Zealand report.

"We think it might be heat

related in some individual vehicles," Vinsen says.

May 16

Simon Bridges ambivalent on "feebate"

Opposition leader Simon Bridges says he doesn't have strong views on the "feebate" proposal which would benefit EVs and penalise gas guzzlers.

The Productivity Commission has proposed introducing what it calls a "feebate", outlined in its Low Emissions Economy draft report.

Low-emission vehicles like EVs would qualify for a rebate, while high-emission vehicles would incur a fee, probably as a one-off transaction at the point of importing a vehicle, at registration, or a combination of the two.

Charger congestion needs sorting – survey

Charger availability is the top priority for electric vehicle owners.

Driving straight into a charger parking space without having to queue and finding the charger in full working order are the main requirements of 108 EV owners surveyed by Flip the Fleet.

Charging station immediate availability was almost twice as important as all other features sought, which included car vacuum cleaners, wi-fi, a toilet or just a cup of coffee.

May 23

BMW NZ ready for EV boost

New Zealand is heading in the right direction with electric vehicles, BMW Group New Zealand managing director **Florian Renndorfer** says.

That's helping BMW NZ with its own EV plans.

The Government's target of 64,000 EVs by 2021 sends a very strong message, Renndorfer says.

Electric vehicles

bugged

Tracking devices are being planted in electric vans and cars to measure their performance every minute.

It is all part of testing how well the EVs go in New Zealand conditions for work and play, where people drive and charge them, what they cost to run, even how hot their batteries get.

The "EV Black Box" taps into the EV's instruments and transmits the data via the 3G network to a communal database operated by Flip the Fleet, a coalition of over 830 EV owners from throughout New Zealand.

May 24

Vehicle electrification puts pressure on grid

The electrification of vehicles and factories could see electricity demand double in the next three decades, a new report says.

Government-owned Transpower highlights in its white paper, Te Mauri Hiko, that demand could increase from about 40 terawatt hours (TWh) each year to 90 TWh by 2050.

That differs from a report issued in by Transpower in 2016, which predicted electricity demand would fall between 2030 and 2050.

Electrics replace a third of Westpac NZ fleet

A total 65 new electric and plug-in hybrid cars have been welcomed by Westpac NZ for its national fleet.

The Hyundai Ioniq cars, presented at a media event on May 24 in South Auckland, form the first tranche of its nearly 100 EV target by 2019.

The remaining 32 cars will be included in the fleet as leases expire.

May 29

First fast charger in Queenstown opens

Continued on page 31

Continued from page 30

Queenstown has opened its first electric vehicle (EV) fast charger.

Energy and resources minister Megan Woods did the honours on May 29 at Pak'nSave Frankton.

It's just in time for winter travellers making the most of the ski-fields and other tourist attractions.

Tesla expanding New Zealand supercharger network

Tesla intends accelerating its New Zealand supercharging network installations during the next 18 months.

The first three already link key locations across the North Island on major highways.

An additional nine super-charger stations are planned to allow full connection from north to south on both islands.

May 30

Helping businesses benefit from EVs

Advice on how to introduce electric vehicles into company fleets is provided by Drive Electric.

The EV advocacy group has released its latest white paper Building an Electric Fleet: a "How-to" Guide for Businesses Considering Transitioning to Electric Vehicles.

Meridian Energy procurement manager **Nick Robilliard** is a key contributor after successfully transitioning half of the company's passenger fleet to EVs

May 31

NZ joins global Electric Vehicle Initiative

New Zealand has joined a multi-government forum of the world's top electric vehicle

markets dedicated to accelerating EV uptake.

Membership of the Electric Vehicle Initiative (EVI) will link New Zealand into international best practice around EVs including policy, research and information sharing, Energy Efficiency and Conservation Authority (EECA) chief executive Andrew Caseley says.

"Being part of this initiative puts New Zealand alongside the top EV markets in the world, demonstrating to industry our readiness to adopt new EV technologies," he says.

EV element mining could step up

A search for rare earth elements (REE) in New Zealand for the electric vehicle industry could herald a new wave of mining.

Our strategic mineral potential has been greatly enhanced by a GNS Science study highlighting areas of

interest across parts of the country, energy and resource minister Megan Woods says.

The results of the *Mineral Potential Studies* into lithium, REE and nickel-cobalt were released at the New Zealand Minerals Forum in Queenstown.

EVs – three million to 125m in 12 years

Electric and plug-in hybrid car numbers will rise by at least 122 million within 12 years.

So says the International Energy Agency's latest Global Electric Vehicles Outlook report.

It says in 2017 the world had more than three million EVs – up 54% on 2016 – and forecasts EV numbers to reach 125 million by 2030. ■

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EV TALK DIARY

EVtalk Australia editor

Geoff Dobson looks at the month gone by on www.evtalk.com.au



May 11

Australia's first EV how-to guide

Australia's first guide to installing EV chargers for property owners, planners and developers has been released in Queensland.

Electric vehicle ownership is gaining momentum, and residential and commercial buildings in Queensland, as well as public infrastructure will need to keep up with the technological advancement, says state development, manufacturing, infrastructure and planning minister Cameron Dick.

"Queensland has been leading the transition with charging stations from Coolangatta to Cairns."

May 24

Australia 'seven years' behind on EVs

Australia is "about seven years" behind global uptake of electric vehicles, Electric Vehicle Council chief executive **Behyad Jafari** says.

A new report by Bloomberg New Energy Finance estimates worldwide demand for electric vehicles would rise to almost 1.6 million in 2018, up 45% from a year ago.

The consultancy predicts global sales "to explode in the late 2020s as the technology establishes a cost advantage over internal combustion engine car," reaching 30 million by 2030.

May 25

Brisbane to host 17th Asia Pacific ITS Forum

Brisbane will host the 17th Intelligent Transport Systems Asia Pacific Forum in May 2020.

The announcement came during the recent ITS Asia Pacific Forum in Fukuoka, Japan.

"Queensland is at the forefront of developing and deploying ITS technologies, particularly in the area of cooperative and automated vehicles," transport and main roads minister **Mark Bailey** says.

May 30

Fifty charging stations from ACT

Fifty new standard dual electric vehicle charging stations will be rolled-out at Canberra

government sites during 2018-19.

The announcement came from Australian Capital Territory climate change and sustainability manager Shane Rattenbury.

The \$456,000 roll-out will be funded by the territory government.

May 31

Drafting of autonomous vehicle driving laws begins

Ministers have begun drafting laws that will govern autonomous vehicles (AVs) on Australian roads.

The National Transport Commission has announced national laws will be in place by 2020, ensuring a "legal entity" is responsible for the actions of AVs.

The new laws are guided by the NTC's 2017-18 consultation paper. ■

EV CHARGING LOCATIONS

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FORWARD TOGETHER

Fast / Super Charger Locations – North Island

Kaitia	Te Ahu, 28 South Rd	Mt Maunganui	Bayfair, 19 Girven Road
Kerikeri	1 Butler Rd	Mt Maunganui	New World, 1 Tweed St (25 kWh)
Kaikōhe	Library Carpark, 14 Marino Pl	Cambridge	73 Queen Street
Kawakawa	4 State Highway 1	Te Awamutu	10 Scout Lane
Tikipunga	Paramount Plaza, 1 Wanaka St	Whakatane	i-Site, 30 Quay St
Whangarei	11 Alexander St	Opotiki	i-Site, 70 Bridge St
Raumanga	McDonalds, 130 Tauroa St	Te Kaha	Te Kaha Bch Res, 3 Hotel Rd
Dargaville	Totara St Park, 113 Totara St	Te Araroa	22 Rata St (25 kWh)
Kaiwaka	1 Kaiwaka-Mangawhai Rd	Rotorua	1134 Haupapa St
Warkworth	New World, 6 Percy St	Matawai	6522 Matawai Rd
Warkworth	BP, 67 Auckland Rd (SH1)	Tolaga Bay	43 Cook St (25kWh charger)
Orewa	New World, 11 Moana Ave	Te Kuiti	New World, 39 Rora St
Silverdale	17 Hibiscus Coast Hwy	Murupara	Pine Drive Car Park, Pine Dr
Albany	The Warehouse, 186 Don McKinnon Dr	Taupo	Firestation, 1 Kaimanawa St
Rosedale	McDonalds, 14 Constellation Dr	Taupo	Tesla, 1 Kaimanawa St
Kumeu	New World, 110 Main Rd	Gisborne	21 Gladstone Rd
Henderson	Pak'n'Save, 224 Lincoln Rd	Moreere	Hot Pools, 3968 SH2 (25 kWh)
Akld CBD	Vector, 21 Hobson St	Rangitaiki	Lodge Café, 3281 SH5
Beach Rd	Z Station, 150 Beach Rd	Turangi	1 Pihanga Rd
Newmarket	1 Gillies Ave	New Plymouth	66 Courtenay St
Greenlane	McDonald's, 320 Gt Sth Rd	Wairoa	75 Queen St
Pakuranga	BP, 322 Pakuranga Rd	Putorino	5466 State Highway 2
Botany Downs	Z Station, 550 Te Irirangi Dr	Te Haroto	Mc Vicar Rd, 4237 SH5
Akld Airport	Shopping Ctr, George Bolt Mem. Dr	Waiouru	Cnr SH1 & Hassett Dr
Akld Airport	Z Skyway, George Bolt Mem. Dr	Hawera	Pak'n'Save, 54 Princes St
Takanini Vill.	30 Walters Rd	Napier	206 Dickens St
Coromandel	44 Woolams Rd	Hastings	100 Queen St W
Whitianga	4 Lee St	Mangaweka	2 Koraenui St
Tairua	Carpark, 6 Tokoroa Rd	Waipukurau	34 Russell St
Pukekohe	King Street Carpark, 56 King St	Dannevirke	24B Gordon St
Pukekohe	Counties Power, 14 Glasgow Rd (Bus hrs)	Woodville	i-SITE, 43 Vogel St
Thames	505 Mackay Street	Palmerston Nth	i-SITE, 126 The Square
Whangamata	100 Hetherington Road	Palmerston Nth	Tesla, 365 Ferguson St
Te Kauwhata	16 Wayside Rd	Levin	New World, 21 Bath St
Waihi	New World 35 Kenny St	Otaki	155-163 Main Hwy
Te Rapa	WEL Networks, 114 Maui St	Masterton	3 Dixon St
Hamilton	Tesla, The Base, Te Rapa Rd	Porirua	2 Serlby Pl
Hamilton	Caro St Carpark, 7 Caro St	Featherston	SuperValue, 42 Fitzherbert St
Ruakura	Waikato Innov. Pk, 9 Melody Ln	Upper Hutt	24 Queen St
Raglan	43 Bow St	Lower Hutt	Dowse Art Museum, 1 Stevens Gr
		Petone	Z Station, 60 Hutt Rd
		Te Aro	Z Station, 174 Vivian St

-  Fast Charger Locations
-  Destination Charger Locations
-  Tesla Charger Locations

