



Feebate success could rely on EV supply

A proposal to introduce “feebates” on imported vehicles could be disrupted by a lack of electric vehicles, dealers say.

In an effort to reduce carbon emissions, The Productivity Commission is proposing to introduce extra fees on imported gas guzzling vehicles, while offering rebates low-emission petrol vehicles and electric vehicles.

A fuel economy standard would be needed to make the scheme work.

Genuine Vehicle Group (GVI) general manager **Hayden Johnston** says the group was involved in consultation with a government representative about the “feebates” proposal a few months ago.

He doesn't think the proposal would hit his business too hard.

“If the Government implemented something like this it needs to be user-pays – at the time of registration,” he says.

“That’s a more guaranteed way to collect it rather than at the border.”

However, he notes in certain vehicle

segments, there are limited electric options.

“People driving high emission vehicles are usually doing that for a reason, often because it’s fit for a purpose.

“I think we’re ten-plus years away from having a viable EV model for every application, like utes, SUVs and vans.

“I don’t think we’d bring in more EVs as a result of this. We’re trying to do that [bring in more] regardless.”

Farmer Autovillage group managing director **Michael Farmer** says the Tauranga-based new and used vehicle dealership would “do our best to adapt” if the feebate system is implemented.

“So long as it’s a simple and easy to understand system – that’s the key to it.”

He believes the dealership, which also caters for electric vehicles and plug-in hybrids, would be “relatively balanced”.

But Farmer says New Zealand doesn't have enough EVs yet to centre a feebate system around them.

“I think introducing it before 2025

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Hayden Johnston



Michael Farmer



Sporty Niro EV due next year

The Kia Niro EV is due here in early 2019.

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.

Following the successful introduction of the Niro hybrid and plug-in hybrid models locally in March, Kia Motors New Zealand says there is strong anticipation for the EV version.

“The acceptance of the hybrid and plug-in hybrid Niro models by New Zealand buyers has been exceptional,” Kia Motors New Zealand general manager **Todd McDonald** says.

“It has proved to us that there is a place in the regular market for a well-designed SUV that delivers astonishingly low fuel consumption. With petrol prices set to jump as a result of the incoming fuel taxes there is every expectation that demand will continue to climb for all variants of Niro.”

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**DRIVE
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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 skifield may become slightly trickier.

Which will make them a key market for electric vehicles – and the distributors know it. Renault New Zealand is already in the segment with their Kangoo ZE, Mercedes-Benz and Volkswagen have plug-in vans coming, and even Ford is testing a PHEV version of its Transit in Europe. Most of these vehicles are used for 'last-mile' deliveries. From a depot to city locations – 100-200km with the ability to recharge during loading should do the trick.

And this is exactly where LDV distributor Great Lake Motors has pitched the first large electric van offered for sale in New Zealand, the EV80. The 10.4 cubic metre cargo van can carry up to the 1000kg payload (down 400kg on the diesel version) - fitting up to three pallets. They claim the high-efficiency lithium iron phosphate battery can be fully charged in two hours, giving in a 150km to 180km range with about half the maximum payload.

With a 56kWh battery and weight of around 2,600kg, we wanted to find out for ourselves how far we could push the van. The plan? Collect it in Takanini, and drive north through the city, running delivery style errands before some highway work north. There was one restriction, the prototype model on test does not AC charge – like the production model does – so we had to keep ourselves in range of a suitable charging station. A demo before our departure meant we were also leaving with a not-quite-full battery.

While initially empty, and with an Auckland storm blowing away or planned load, we managed to find a few things to throw in the back of the LDV – a desk, some heavy magazine boxes and the Niu all-electric scooter. We like to think this was the first time a road-registered EV has been carried

inside another road-registered EV in New Zealand.

While we are back here, we should note the LDV is well kitted out. There is a full metal barrier for cabin safety, handy load hooks and lining for the floor, walls and wheel arches – a practical touch missed by some mainstream commercials.

The relatively small load failed to dull the performance of the van. The front-wheel drive unit offers 100kW and 320Nm and is tuned for work within town. Acceleration is pretty good to around 60km before it tapers off. The



van is limited to 107km/h – though feels at home on the motorway as the top speed is restricted rather than simply being a power limitation.

There is some whirr from the drivetrain; otherwise, for a van, it is very serene. If there was a complaint about the van's power it is how it transitions between drive and regeneration – at times it is perceptible both as a sound and a thunk through the van. It is very light and hopefully something that can be tuned out of the controller over time.

We think the EV80 steers and rides better than the rest of the LDV range. The electric power steering feels solid and responsive enough for round town work. The weight of the battery removes the bounce experienced in this kind of vehicle and gives it a solid planted feel. One slight concern we have with the vehicle is putting it in 'Park' does not lock the transmission – it is free to roll away unless you engage the electric handbrake.

Driving information is in short supply in the EV80. The fuel gauge has been repurposed into a basic battery meter, with the final red bar still indicating a state of charge of nearly 20% in our

tests. You also get to see battery voltage, a range meter – which we found fairly stable – and energy usage.

Oddly the power usage bars are the same as the regen bars, despite the vans ability to use power is over four times its ability to regenerate it.

The sector from Takanini to Auckland city via Penrose was fairly simple. We left with a range of 190km showing, and did the trip in largely the range we would expect to. The trip north was slightly more taxing, with heavy traffic keeping usage down as far as Silverdale, and motorway and open road highway speeds taking their toll. Still, with regen, the numbers did not fall as quickly as expected. We rolled past the last free DC charger at Warkworth a little nervous, but fairly confident we would make it to the next one – at the base of the Brynderwyns in Kaiwaka. And we did – arriving with 21km to spare.

That adds up to a very real world range exceeding 160km. LDV has been marketing the EV80 to customers with between 150km and 180km possible, and they are on the money. A little more caution and I see 200km as an absolute possibility.

Slow-fast charge

The prototype van we were driving is not a quick charge on DC; it will max out at just short of 28kW/h – which means two hours is about the best you will do from near empty to full.

A higher rate of charging is reportedly coming to the production models, but even then charge times on public chargers could become obstructive. Added to that, the distance from the front of the van to the charge point makes the use of ChargeNet units a little tricky – at Kaiwaka we had to park next to the charging park rather than in it to – just – reach.

Overnight and between job AC charging will solve this problem for commercial operators, though the investment in a 25kW charger may be a smart move, especially if multiple units are operated.

Not just a van

The EV80 is being pitched for more work than just cargo. A local ten-seater

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Electric double-deckers getting set for fleet

A fleet of 10 new electric double-decker buses are in the works and set to hit the streets of Wellington.

They are to be operated by family-owned Masterton-based Tranzit Group Ltd which was the preferred bidder for eight contracts in the region.

Tauranga-based Kiwi Bus Builders are delivering 40 new buses, including

the double-deckers, for Tranzit Group. The buses are set for operation by July this year.

The fleet will also include 28 Euro 6 diesel double-deckers which are being built by Chinese company Bus and Coach International.

A further 114 Optare MetroCity buses, built in the United Kingdom, were recently delivered to the trans-



port operator with a special ceremony at the British High Commission. The total cost of that order was \$40 million.

The first 12 of those buses are already set to begin operation in the capital and

surrounding region.

Uzabus, which is based in Palmerston North, was also the preferred partner for the bus contract in Kapiti.

The electric buses sit on specially designed chassis and takes the team at Kiwi Bus Builders around two to three months to be fully complete.

Tranzit Group transport and operations director

Continued on page 10

POWER DEALS FOR EV USERS

Company	Energy Deals	Where	Cost to charge LEAF*
 meridian	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
 Mercury	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
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	\$6.08 \$4.50 \$4.33
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.

Going green with Think Blue Waikato

If you had to pick one colour that best represents the Waikato, you'd probably opt for green – as in dairy pasture and forestry.

But now people there are being asked to "Think Blue Waikato".

So what's this all about?

Think Blue Waikato is a group of businesses, local bodies and community groups who have committed to a "greener" and more sustainable Waikato by taking part in a minimum one-year electric vehicle trial.

Ebbett Volkswagen is behind the idea, using VW's global "Think Blue" concept which encourages people to act in a more environmentally friendly and sustainable way, particularly when it comes to their vehicles and everyday life.

Blue is also the colour for electricity – as used, coincidentally, by Waikato's WEL Networks for its growing number of EV chargers around the region.

So when the Hamilton-based Ebbett Group team got six VW e-Golf electric cars, they decided that rather than just sell them all they'd give businesses the option of leasing them under their Think Blue Waikato partnership.

That way the partners could showcase the benefits of using an EV to staff and others, especially from a sustainability view point.

Ebbett Volkswagen dealer principal **Richard van den Engel** says it's good for businesses to be seen as green (or blue in this case) and early movers.

He says many people want to try electric but are unsure about where to start.

"This a better way," van den Engel says. Each busi-



Richard van den Engel, left and Gareth Nuzum from IT Partners with VW e-Golfs in Think Blue Waikato livery.

ness agrees to lease an e-Golf for at least a year and then tells their story on the website www.thinkbluewaikato.co.nz – "warts and all".

"The interest has been incredible, particularly as people have different reasons for getting around and they realise its environmentally friendly, sustainable and the right thing to do."

After getting agreement from IT Partners, the first partner business to join Think Blue Waikato, van den Engel says word quickly got around IT Partner's workplace.

"For the next 24 hours, everybody in the building couldn't talk about anything else, saying they're proud to work for an organisation that takes sustainability seriously."

He says those involved then go on to tell their mates it's a good place in which to work.

Some don't quite understand but get involved and then see the spinoffs, van den Engel says.

Think Blue Waikato encourages those apprehensive about going into electric vehicles to "dip their toes in the water and commit to a more sustainable workplace",

he says.

"It's a safe environment to test what's new."

Questions such as costs around charging, range anxiety, what happens if the car runs out of electricity,



Richard van den Engel, front, and Gareth Nuzum from IT Partners.

whether a charging station should be installed at work, and if someone takes the car home then who pays for the power – can all be answered.

"Most of the partners use their e-Golf as a pool car and people charge them at home," van den Engel says.

He's delighted with the way the Think Blue Waikato project is going.

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Moana Blue are turning a little green!



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Hamilton, city of the future

Hamilton is about to live up to its handle “City of the Future”, particularly in developing a “Smart Hamilton” initiative.

While the City of the Future name was apparently given with some irony in the late 1990s (much like its nickname The Tron), the Waikato city is heading down that track, especially with electrics.

That’s as in electric vehicles (EVs), electric bikes, electric buses and possibly electric rail.

Advanced, intelligent transport operation and EV charging stations in association with WEL Networks are among priority projects in the “Smart Hamilton” initiative.

The council says in the Smart Hamilton document that the city’s size and scale mean it’s “small enough to try things and big enough to make them meaningful”.

The Smart Cities style programme aims to leverage innovation, technology and insight to make cities more liveable, optimise resources and create sustainable economic growth.

Hamilton has the capability, and a growing population that requires action, especially before it develops neighbouring Auckland’s traffic congestion woes.

While Hamilton’s peak periods may be shorter than Auckland, the Ministry of Transport reports that motorist delay in minutes per km travelled because of congestion is already on a par with Auckland at times. This is likely to increase given that Hamilton’s population is expected to reach nearly 169,000 by June and the Waikato region will swell to



470,000 people by 2031.

Concern that Hamilton could soon experience Auckland-like transport issues prompted renewed calls for a regional fuel tax from Hamilton City Council growth and infrastructure committee chairman **Dave Macpherson** recently.

He’s saying about 48,000 people make the daily commute into Hamilton’s central business district.

Many people are now commuting to Auckland too.

The Hamilton to Auckland expressway completion might help with the journey which can take around two hours.

And a new passenger train from Frankton station to Auckland could be operational soon, linking with the electric train service at Papakura.

The aim is for a twice morning and twice evening service which could eventually be extended.

Whether the full distance will eventually be electric has yet to be decided.

The city council and the Waikato Regional Council have an end of May deadline to include the rail plans in both their long-term plans, with the city intending to adopt the plan on June 28.

The city council also acquired 2.1ha at Rotokauri near The Base to develop a park and ride facility to support the proposed rail link.

One possibility to ease Hamilton traffic issues is to get more people on electric bikes, with interest in e-bikes there growing.

Electric bikes can tackle head winds and hills easily without the rider working up a sweat and are often a quick way to commute.



John Kinghorn

The council itself could adopt a similar scheme to its Tauranga counterpart with staff using e-bikes, setting an example in the process.

City Transportation community engagement adviser **Ngaire Atmore** says Hamilton is well suited to cycleways, which e-bikes can use, as the city is largely flat with reasonable weather year-round.

It has the award-winning Western Rail Trail shared path alongside the main trunk line which links southwestern suburbs with the CBD, and a connection could also be provided to The University of Waikato.

Atmore says there are already many on-road cycleways, but none yet with the separation from traffic like those in Auckland.

E-bikes could be considered alongside electric buses and other electric vehicles, City Transportation infrastructure systems engineer **John Kinghorn** says.

The Waikato Regional Council is responsible for contracting and providing bus services in Hamilton city and for some of the region’s communities, working closely with Hamilton City Council on route planning.

Electric buses don’t appear to get specific mention in the Waikato Regional Public Transport Plan 2015-2025, but may be covered generally. An objective of the National Energy Efficiency and Conservation Strategy, for instance, is for a more energy efficient transport system with a greater diversity of fuels and alternative energies.

The council could also work with “smart” developers on ideas, such as having EV charging sites working off solar grids and cloud-based networks.

Car sharing – usually involving EVs – is another transport option becoming established in other cities, and could help Hamilton.

Apps may summon rides, rather like Uber, so that vehicle ownership may eventually fall.

Kinghorn says apps can be used to find when the next bus is due, and may eventually allow people to be picked up outside their home and workplace rather than at bus stops.

The Design Factory at Wintec has students working on the issue of encouraging people to use alternative modes of transport.

Kinghorn says the Lead-

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Taiwan's own EV car on sale next year

Not content with designing and manufacturing every piece of auto equipment imaginable, Taiwan plans to put on sale its very own EV in 2019.

It is the Luxgen S3 EV, a very smart and roomy five-seater sedan, already available with petrol power.

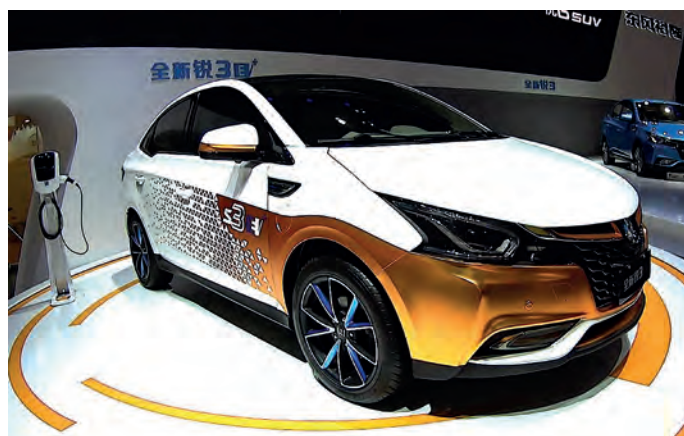
Luxgen is no stranger to car manufacturing, having made vehicles for Nissan and Mitsubishi, as well as its own Luxgen branded vehicles for many years, but the S3 EV is its first venture into electric vehicles.

EVtalk was given a short test drive in the S3 at the



The two-seater.

Taiwan EV show in Taipei last month, and it compares favourably with EVs such as



The Luxgen S3 EV.

the well-known Nissan Leaf.

Pricing will not be known till next year, and it is unlikely that we will see the Luxgen EV in NZ in the near future.

Another EV demonstrated to EVtalk was a two-seater micro EV, supposedly selling in its hundreds in Europe. ■

Amazing range of scooters and chargers

A fantastic variety of electric scooters was on display at the EV Taiwan automotive show, as part of Taipei AMPA last month.

And with the scooters were an array of chargers, too.

One that particularly took EVtalk's fancy was a "hands-free" charger where the scooter was simply ridden into the charger.

Provided the front wheel of the scooter has a standard diameter of 10 inches, the charging system can be retro-fitted to any scooter.

The scooter can be docked, automatically clamped and charging under way within 15 seconds. It fully charges in 20 minutes.

Another more con-



Demonstrating the "drive-in" scooter charger at the Taiwan show.

ventional electric scooter charger provides the vehicle with a 50km range within six minutes and a 100km range within 12 minutes, close to the average of traditional scooter refuelling times.

Both systems provide smart charging technology that measures the scooter's

battery health and automatically provides the appropriate charging rate. Both also use cloud services to monitor battery charge and discharge conditions with an early-warning system for any abnormalities.

The cloud also provides management and billing for

the charging.

The displays of electric scooters were mind-boggling, but come with a word of warning - some are built three-quarter size to accommodate smaller Asian bodies and would not work with Kiwi physiques. ■



A free-standing scooter charger.



Jucy idea for campervan fleet

Jucy could introduce five to 10 more electric campervans this summer following the success of a trial tour of New Zealand in one by two French students.

Longer range Nissan e-NV200 40kWh vans may be added to Jucy's campervan fleet, possibly for this coming summer, Jucy chief operating officer **Dan Alpe** says.

He says most campervan customers do around 150km to 170km daily, so the 40kWh vans would be more suitable with a range of about 200km on a single charge.

The students, Heloise de Bokay and Solene Trinquet, are due for a debrief with Jucy designers and other staff in June.

Alpe says Jucy has received constant feedback from the pair during their seven-month tour in a converted prototype e-NV200 campervan for which Jucy donated the use.

Coincidentally, Alpe caught up with the students in Queenstown recently when they stayed at a Jucy Snooze hotel.

He says the colder weather has shortened the campervan's range from around 100km to about 90km, and the students were also taking some detours to see the views.

Their itineraries will be very useful for Jucy too, possibly able to be used by other tourists.

Charging experiences will also be discussed. The pair had once instance where they had to door knock and use a householder's power to charge up during the Kaikoura leg of their South Island trip.

Alpe says Jucy is investigating the installation of chargers in camping grounds, especially in areas where charger access is limited.

The students have been using a pop-up rooftop tent on their campervan for



Dan Alpe.

sleeping, rather than the van's interior bed, something Jucy's designers are expected to discuss.

"They only used the interior bed when there was a storm one night," Alpe says.

He says a rooftop bed creates more weight and drag.

The French tour has been good for promoting EVs in general and Jucy in particular.

Trinquet and de Bokay have attended many events, such as the Leading the Charge EV tour Nelson stopover and EV City's opening in Christchurch.

These and other occasions have featured on social media, through *EVtalk* and other avenues.

"It's been great to get that amount of feedback," Alpe says.

The students have been adopted by New Zealand's EV community, which has provided advice and help when needed.

Green Cabs allowed them to charge their campervan for free in Queenstown, for instance. They also have a



Solene Trinquet, left and Heloise de Bokay.

partnership with ChargeNet while here.

Alpe says Jucy is committed to providing a clean, green, environmentally friendly travelling experience for visitors to New Zealand. "Ultimately, our goal is to offer a product which will also play a part in environmental tourism."

He says after reading about the French students' plans in *EVtalk* he reached out to them and has found the whole experience worthwhile. "It's been valuable because they will have been here so long, rather than just a month, which gives us a lot more data to work with. They've been great ambassadors for us."

Alpe says the Jucy electric campervan has been based at the Trenz 2018 travel and trade show in Dunedin from May 7-10, the show attracting more than 1500 delegates from around the world.

It highlights New Zealand's \$35 billion tourism industry.

During the show, the French pair travelled to Milford Sound, boarding one of Jucy's boats.

After completing their South Island journey, Trinquet and de Bokay will return to the North Island to complete some parts they've missed.

They plan to return to France around July or August. ■

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Feebate success could rely on EV supply

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would be crazy."

Farmer says the tipping point for EVs in New Zealand will probably be around 2022-2025, so the system could be implemented after that.

"The tipping point will be when someone walks into the showroom who would never have considered an EV before, compares the price of a petrol vehicle with an EV and buys the electric," he says.

Auto Court in Dunedin imports both used electric and petrol/diesel powered vehicles, and its family ownership is uncertain just how the feebate proposal would affect the long-running business.

Director **Nelson Cottle** says he will be interested to see how the scheme might look if and when it becomes reality.

However, Cottle acknowledges the dealership is struggling to get good used electric stock from Japan now because of high demand world-wide, particularly for Nissan Leafs.

Toyota New Zealand chief executive **Alistair Davis** says

the greatest impact will be if the scheme influences demand for vehicles outputting less emissions.

"Overall the objective of the scheme is focused on reducing vehicle emissions, which is a primary focus for the automotive industry, and in-line with Toyota's national and global objectives.

"The proposed scheme also supports our expansion of hybrid vehicles within our range, and plug-in hybrid models like the new Prius Prime. A feebate could potentially provide better visibility to the end customer and increase the importance of emission levels when considering a vehicle purchase."

Tradeable credits?

Another issue that could impact how importers bring in cars is a "tradeable credits scheme, which is reportedly being worked on by the Ministry of Transport.

Imported Motor Vehicle Industry Association (VIA) chief executive **David Vinsen** says his understanding of the

proposal is it would be used to influence which models importers are bringing into the country.

"If one importer was bringing in a whole bunch of Nissan Leafs that are way below the maximum [fuel] average they would get credits that have a tangible value.

"They could then be sold on to another importer who wants to bring in a Hummer."

However, the dealers spoken to were reluctant to speculate on a tradeable credits scheme until they knew more about it.

Toyota NZ was also keen to find out more.

"Our net vehicle emissions across new vehicles sold is ok, but the introduction of more hybrid vehicles will bring this down minimising any tradeable debt," Davis says.

Industry impact

Whatever happens with the feebates and tradeable credits proposals, Vinsen says the changes will influence which vehicles come into the country.

"It's going to skew the model range available."

Motor Industry Association chief executive **David Crawford** is welcoming debate on the issue, spurred on by the Productivity Commission's report.

"When it comes to transport, New Zealand is a technology taker. How we leverage the importation of low carbon technological innovations is important, especially given the high volume of old imported vehicles that are on average one to two generations behind technologies found in new vehicles."

Associate transport minister **Julie-Anne Genter** acknowledges discussions are taking place.

"I've asked officials to look at a wide range of options to make low-emission petrol and electric vehicles more affordable and accessible to New Zealanders.

"This will include looking at the options put forward by the Productivity Commission.

"Officials will engage widely with the motor vehicle industry and public on these all of issues before any policy decisions are made." ■



Nelson Cottle

Electric double-deckers getting set for fleet

Continued from page 4

Keven Snelgrove says progress is going extremely well.

"Kiwi Bus Builders are doing a great job working flat-out on new diesels and the electric double-deckers," he says.

The first diesels have already come off the line with around two completed each week.

"But it's the progress of the electric double-deckers that's really exciting.

"We've got chassis on site in Tauranga for framing and everything's in place to speed up what's a really

innovative build process."

Greater Wellington Regional Council chairman **Chris Laidlaw** says the new fleet is great news for Wellingtonians with significant benefits for all.

"We're excited at the prospect of working with Transitz Group and Uza-bus to bring a modern bus service to the region and its people.

"Both are locally-owned family businesses with over 160 years' of combined experience in delivering quality services to passengers and drivers," Laidlaw says.

Laidlaw says Transitz had given

councillors a commitment to employ as many bus drivers as possible from the region's existing workforce.

New charging station technology is also been developed to meet the arrival of the electric buses.

This includes a \$1.5 million state-of-the-art charging station to be installed in Island Bay in June.

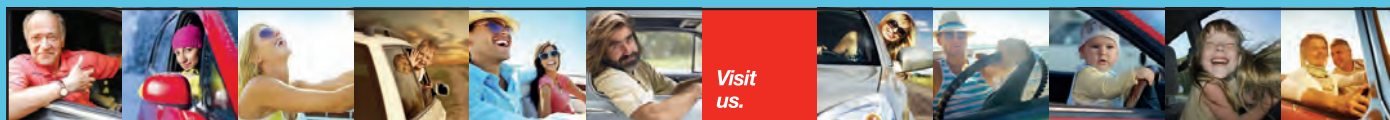
The supercharger will produce 450 kilowatts of power and will have the ability to fully charge an electric bus in eight minutes.

Most electric car charging stations can only produce 30 kilowatts. ■

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Houston Mitsubishi	Nelson
Houston Motors	Blenheim
Christchurch Mitsubishi	Christchurch
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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
	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	PHEV	\$96,400	31 km + 700 km
	C350 e Sedan	PHEV	\$99,400	31 km + 700 km
	C350 e Estate	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	\$38k - \$70k	200 km
Hyundai	Ioniq	BEV	\$52k - \$57k	220 km
	Ioniq Elite	BEV	\$59k - \$60k	220 km
Kia	Soul EV	BEV	\$37k	150 km
Mercedes Benz	B250 e	BEV	\$48k - \$51k	140 km
Mitsubishi	i-Miev	BEV	\$14k - \$17k	100 km
	B-Miev Van	BEV	\$12k	100 km
Nissan	LEAF Generation 1	BEV	\$9k - \$18k	120 km
	LEAF Gen 2 - 24 kWh battery	BEV	\$14k - \$28k	135 km
	LEAF Gen 2 - 30 kWh battery	BEV	\$24k - \$43k	180 km
	LEAF ZE1 - 40 kWh battery	BEV	\$53k - \$64k	250 km
Renault	e-NV200 van	BEV	\$20k - \$26.5k	140 km
	Zoe 22 kWh	BEV	\$30k	220 km
Renault	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	\$120k	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 - \$59k	45 km + 600 km
	Q7 e-tron	PHEV	\$150k	54 km + 800 km
BMW	i3 REX	PHEV	\$44k - \$63k	200 km + 150 km
	225xe	PHEV	\$50k	41 km + 550 km
	330e	PHEV	\$49k - \$77k	37 km + 550 km
	X5 xDrive40e	PHEV	\$140k	30 km + 800 km
Mercedes Benz	i8	PHEV	\$122k - \$200k	37 km + 400 km
	C350 e Sedan	PHEV	\$64k - \$90k	31 km + 700 km
	GLE500	PHEV	\$140k	30 km + 700 km
	E350 e	PHEV	\$120k	30 km + 600 km
Mini	S500 e	PHEV	\$96k	30 km + 700 km
	Countrypman Cooper SE	PHEV	\$67k	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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Volt Vehicles 0800 748 658 / 022 4800 722 david@voltvehicles.co.nz	Auckland
PlugN Drive NZ	Auckland
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MICRO EVS



A year on an e-bike

Will Hine has owned an electric bike for 12 months. Here he answers all the questions he regularly gets asked about and explains why he wouldn't be without his e-bike.

I'm not one for fads.

I view products that are suddenly popular with a healthy dose of cynicism, and my enthusiasm for things I like is usually measured rather than emphatic.

So, I'm mystified as to how I came to fall in love with an electric bicycle.

By all rights I should have denounced the technology as a momentary trend that would be gone as soon as it had arrived.

But, 4000 kilometres, 130 commutes and one puncture later, the honeymoon is far from over.

I bought my e-bike in May last year for about \$3800.

My other half had suggested I wait until spring, offering predictions the bike would hibernate in our garage through the dark and cold of winter.

As someone seldom given to impulse purchases, I would normally have followed her advice.

But, I had already trialled an e-bike for several days (after discovering the technology while formerly working as a journalist) and my infatuation couldn't be dampened.

I now use the bike for about 75 per cent of my commutes to my new workplace at Britomart, with the car or train accounting for the rest of the trips.

It's about 15km each way between New Lynn and the office, with about 80% of the ride on bike paths or shared paths – I'm lucky that I live in a part of Auckland served by some pretty good infrastructure.

In the morning the journey time is about the same as a normal car commute, but much quicker when the city's caught up in gridlock.

Returning home, I find the bike slightly slower than the car option, but infinitely more enjoyable – especially on a summer's day when I often take a scenic detour.

I ride in my work clothes. Sure, I get a bit sweaty riding home on the hottest of evenings, but the morning ride always has me arriving at work cool, comfort-



Will Hine with his Forza e-bike.

able and clear-headed.

In terms of raw speed on the flat, the e-bike has me cruising at about 30km/h – enough to push me along past mountain bikes and city bikes, but not enough to keep up with the lycra-clad warriors on road bikes.

And the best bit is that it's only slightly slower – and no more strenuous – going uphill or into the wind, thanks to the electric motor.

To answer a common question, no, the e-bike doesn't charge itself through regenerative braking. Few do. Instead, the battery plugs into the wall.

The overnight charge in my garage is enough to power the 36v 19Ah battery to and from my workplace.

A lot of people I talk to are curious about the cost of that charging. The effect of my bike on my power bill has been negligible. In fact, comparing a series of monthly power bills year on year, I was surprised to find our electricity use has somehow declined slightly – a pleasing mystery.

The bike also saves me \$15 per day in car parking. Let's call it \$20 a day when I include the cost of fuel, tyres and vehicle maintenance as well. So, \$100 a



E-biking is great for mental health.

week if I manage to get on the bike five times.

Of course, against that I need to weigh up the occasional cost of a new set of bike tyres and the odd service, and the battery will need replacing one day down the track, at a cost of \$1000 or so.

Still, a few back-of-the-envelope calculations show the bike works out far cheaper.

Of course, the environmental benefits are a no-brainer and were a significant attraction in buying the e-bike.

And my physical health has almost certainly improved, although not as much as if I'd opted for a regular bike.

But, probably the biggest factor in making the switch to an e-bike was my mental health.

I was fed up with the exasperating car commute and the constant idling in traffic and the rude drivers who find new and novel ways to be inconsiderate each and every day.

Twelve months on, whether in sun, rain or wind, my commute is now sometimes the highlight of my day.

I say, without exaggeration, that my e-bike is my favourite possession. □



MICRO EVS



Niu way to get around town

BY RICHARD EDWARDS

As a long-term scooter owner, I can say from experience, they are not necessarily the peak of fuel efficiency.

Don't confuse this with being cheap to run - they require a low capital investment, are slightly cheaper to register than a new car and usually are low to ensure. From point A-to-B and back on a regular basis they are pretty light on your wallet.

For outright fuel consumption they are arguably not so good. The best petrol 50cc bikes will drop under 2-litres per 100km, while most run closer to 2.5 to 3-litres per 100km - compared to 5 to 6-litres per 100km for small cars.

The fact that many are two-stroke engines else adds to the process. No matter how small an engine is, it still needs some fuel to keep it ticking over.

Unless, of course, you go electric - and that is becoming a viable option with road-registered battery-powered scooters beginning to become available on the market.

Scattered imports of such bikes have been around for nearly 10 years, but most lacked the range or power to make them useful.

Probably the best example of a production electric scooter we have seen to date is now available in New Zealand - and it comes from the mind of a local is well.

The Niu brand came from the mind of Europe-based Kiwi car and motorcycle designer **Joseph Nelson** - with help from business partners and investors, the Niu line is now being manufactured where most of the world's small scooters are - China.

Auckland's Scootling is distributing Niu, with their first model on sale being the N1S. Priced at \$4,499, it is nearly three times as much what a basic Chinese 50cc scooter costs, though the gap from mainstream Japanese-brand bikes is more palatable, with a \$2000

premium on the high-selling Suzuki UZ50.

Aside from its form of propulsion, the N1S offers features that assist in justifying the price. The bike is GPS and internet connected straight out of the box. Pair your phone using the NIU app to the bike, and you can monitor its location and battery status.

You will also be notified if the bike or battery are moved or removed unusually - great protection for something that weighs only around 100kg can be easily picked up and put in the back of a van.

The bike can self-diagnose issues itself and comes with a two-year warranty. A USB port even allows you to

charge your phone - there is a cubby hole that will fit most smartphones - while you are on the move. Underseat storage allows a helmet or a small number of groceries to be carried.

The battery, made up of Panasonic 18650 cells, sits beneath the floor plate of the scooter. It is 29Ah in capacity, takes six hours to charge and weighs 10kg. You can charge it while in the bike, or remove it and take it inside for both security and to charge.

This is a key feature for city dwellers - prime customers for a scooter - who are unlikely to be able to charge where they park. It would also allow frequent users like delivery services to maintain multiple batteries on charge for "hot swapping".

Scotling claim a range of up to 80km range on a battery, although make it clear this is in perfect conditions.

From our brief test, we think 45-55km is more likely, though considering a bike of this size can't hit the motorway and is limited to 50km/h under the law means you need to be going longer than you probably really want to for the range to be an issue.

At 120kg I expected to tax the Niu to its limit, though it didn't seem to mind much. It is a very nice small bike to ride.

The brakes feel good, and there is a small amount of regeneration.

On a flat road or even with a small incline 50km/h was easily achievable - marginally more downhill. The digital display is easy to read and understand at a glance - you do not want your eyes off the road and other vehicles for long.

Hills are a challenge, and a steep incline will see speed drop quickly. We tested this with a lighter ride and found the same. This is typical of all small scooters. Nitpicking? We found the mirrors a little loose in their mounts and the underseat storage struggles with a large helmet. Otherwise, this is one of the best small scooters on the market today. ■



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Hamilton, city of the future

Continued from page 6

ing the Charge EV road trip stop in Hamilton was a great way of advertising EVs and allowing people to familiarise themselves with electric cars.

He says that momentum needs to continue.

There are many other facets to Hamilton's transport, such as moves to set up a traffic operations centre, using cameras and

information to provide the public with options to optimise travel.

Kinghorn wouldn't be surprised if Hamilton also eventually gets an autonomous electric air taxi service like the Zephyr Airworks' Cora project under trial in Christchurch.

Which all goes to show that Hamilton is living up to that "City of the Future" tag. ■

Going green with Think Blue Waikato

Continued from page 5

Most of the partners say they joined with the aim of being more sustainable and to reduce emissions and their environmental impact. They see benefits including reduced costs (fuel, maintenance) and all encourage others to get on board with EVs.

Ebbett Volkswagen marketing manager **Amy van Garderen** tried the e-Golf between work and home on most occasions. She found it very quiet, responsive in

acceleration and smooth to drive.

She wasn't concerned about range (the e-Golf has about a 220km real-world range) and she was impressed with its regenerative braking recapturing some of the power.

The e-Golf's lease cost is only marginally more than the equivalent petrol-powered Golf, but van den Engel says it's the green aspect of the Think Blue Waikato scheme that counts. ■

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INTELLIGENT TRANSPORT

Connected Vehicles

Your driving data - private or public property?

Whether drivers are aware of it or not, vehicles in our fleet are becoming connected to the internet at an increasing rate.

New vehicles are equipped with a growing number of sensors which, combined with the onboard computer's AI, sift through an amazing amount of data. The stated intentions of connected vehicles are good; for instance, the ability to share traffic and road conditions.

There are, however, other potential uses. Like the monetisation of your search activity or Facebook data, data on your location, behaviour, and driving habits can be monetised. Like this Facebook data, data generated and collected in the real world should be part of the privacy debate.

It has been estimated that a single connected car will collect over 25GB of data per hour. In New Zealand, the average adult spends almost five hours a week in a vehicle.

This would mean a connected car would likely collect over six terabytes of data per person over a year. If New Zealand's fleet of four million vehicles were fully connected, this could amount to over 25 exabytes of data collected per year (1 exabyte (EB) = 1,000 petabytes (PB) = 1 million terabytes (TB) = 1 billion gigabytes (GB)).

We are assured that this data collection will lead to a better and safer driving experience.

The data, we are told, will be used by the cars themselves to advise us on better routes and parking, but can also be provided to civil planners to identify high-risk or inefficient roads.

It is very likely, however, that another objective is to collect data on consumer behaviours and preferences that could be sold to outside vendors for marketing purposes. This would look very much like what we expect

By **Kit Wilkerson**,
VIA analyst and
adviser, on behalf
of ITS NZ.



from Google and Facebook today.

In my role as a policy analyst for the imported vehicles sector, I have been part of debates on this very topic - the importance of privacy to the general public.

It seems to some that the success of these internet giants in collecting and monetising our data proves the decreasing importance of privacy and illustrates the true potential of selling

is the greatest opportunity – and the greatest risk. Once that data is in the marketplace, who it goes to and why is no longer within our control.

While the risk today might be nominal, as AI evolves and proliferates, potential uses of that data are open to the imagination – and data available today will be archived forever.

Trunk sensor data could be used to see when and where people are buying goods, providing a metric for consumer sentiment. RFID chips on goods, which make shopping more convenient, can add detail to the nature of these goods.

Changes in driving behaviour can be used to inform creditors of a loss of job; on a wider scale, this could be used to predict a financial downturn. A broken-down vehicle could lead to pre-emptive loan offers. The options for collection and potential insights are endless – not all benign.

Companies and governments are being quick to point out that we have a choice to opt out of data sharing.

Unfortunately, it will be likely that drivers will not understand what they're signing away. Of course, this is assuming that the manufacturers are not simply able to convince the government of the necessity of gathering the data, on the grounds of "safety" or "intellectual property".

The data collected by a car about itself will be impossible to divorce from user behaviour; the two are innately intertwined. Allowing, or even mandating, the collection of one is allowing the other.

New Zealand's new Privacy Bill is currently under discussion. It will replace the previous legislation. Public submissions are welcome until May 24, 2018.

I encourage anyone who is interested in this topic to read the proposed bill and make a submission. ■



the fruits of our data back to us.

Car manufacturers and other analytics companies are betting that if they can position the solution right, offering discounts and coupons on a foundation of safety-related features, not only will the public happily sign their data away, the government will eventually mandate it.

Third parties interested in this data will include the obvious, such as insurance companies, panelbeaters, gas stations, city planners, restaurants, shopping centres and more.

As illustrated by the Facebook and the Cambridge Analytica fiasco, the potential to sell data to third parties



INTELLIGENT TRANSPORT

Connected Vehicles

Digital solutions showcased

The latest digital solutions for customers across the transport and infrastructure, industries and utilities sectors were showcased at the ABB Customer World New Zealand 2018 event in Auckland.

ABB presented its industry-leading portfolio of digital solutions, ABB Ability, at the May 8 function in the SkyCity Convention Centre, attended by more than 200 customers.

The portfolio is designed to improve operating efficiencies and empower the digital transformation of customers.

An exhibition of innovative digital and industrial technology was held, all designed with the goal of improving efficiencies, lowering operating costs and enhancing competitive advantage.

Innovations were covered that advance the digital grid of the future and integration of renewable energy, intelligent manufacturing along with software-defined machines to smart sensors, cloud services and smart buildings.

The event featured a range of national and international speakers including Microsoft digital transformation manager **Matt Furse** who engaged the audience on future thinking and the use of the Internet of Things, Big Data, Machine Learning and Artificial Intelligence as accelerators and disruptors for change.

ABB keynote speaker **Ravi Kiran** outlined how data analytics and business



ABB keynote speaker Ravi Kiran.



Matt Furse.

process integration can improve asset performance and increase operational resilience.

Other topics included sustainable transportation papers on electric vehicles and light rail, as well as details around robotics, automation and the factory of the future.

Participants experienced a variety of solution displays, including live demonstrations of robotics, water solutions

and the latest electric vehicle AC wallbox solution.

"Customers can now use ABB Ability to make the most of their existing assets and capitalise on new opportunities presented by the energy and digital revolutions," ABB managing director **Ewan Morris** says.

ABB Ability comprises more than 210 digital solutions using the Industrial Internet to create digitally connected devices, systems and services that dramatically increase productivity, cut maintenance costs considerably and reduce energy consumption.

ABB is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids. Continuing a history of innovation spanning more than 130 years, ABB today is writing the future of industrial digitalisation with two clear value propositions - bringing electricity from any power plant to any plug and

automating industries from natural resources to finished products.

As title partner of Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future.

ABB operates in more than 100 countries with about 135,000 employees.

Visit www.abb.com for more information. ■

Panel to discuss research papers

Two research papers on future data and skills requirements for intelligent transport here will be launched at a May 30 event in Wellington.

The papers are "Data opportunities for intelligent mobility" from **Chris Bowie** of Opus, and "Technology related transport skill requirements and

availability" from **Julian Williams** of Berl and Professor **Doug Wilson** of the University of Auckland.

Research for the papers was undertaken last year.

A panel discussion follows on the topic "Where to next – a private sector and government sector perspective". Panellists include **Andrew Gurr** of ITS

New Zealand (ITS NZ), **Sandy Fong** from the Ministry of Transport (MoT) and **Henry Pretorius** from the NZ Transport Agency (NZTA).

MoT chief executive **Peter Mersi** is scheduled to address the presentation.

The launch is being held by ITS NZ, the NZTA and the Transport Knowledge Hub. ■



Ohmio deal for 150 AVs to Korean firm

Kiwi company Ohmio Automotion has signed an agreement to supply 150 of its autonomous shuttles to a Korean firm.

The agreement was signed by **Mohammed Hikmet**, founder of HMI Group and its subsidiary Ohmio Automotion, and Korea's Southwest Coast Enterprise City Development president **Yoon Jin Bo**.

SolaSeaDo plans a large scale smart city in Korea and will know later this year if it has secured the contract for the development.

The Ohmio deal is subject to the smart city proceeding.

"This is a significant development for Ohmio and a major vote of confidence in what we have developed", Hikmet says.

"The Ohmio Lift is a wholly developed New Zealand autonomous shuttle. This commitment to source our vehicles for this Korean development is a great demonstration of what we can do in New Zealand."

HMI Technologies chief executive officer **Dean Zabrieszack** says he's unaware of any other commitment to deploy as many autonomous vehicles (AVs) as this one.

"We think this is the largest single deployment of autonomous shuttles in the world.

"Of course, we will only know if this is going to happen if SolaSeaDo finalises the contract for this development. SolaSeaDo is very confident about that outcome, so we are very excited by this prospect."

The Ohmio Lift is a 20-person shuttle that can be extended to carry up to 40 people (the Ohmio Lift XT1) to operate on pre-determined routes



Ohmio Automotion is developing a range of autonomous vehicles. Christchurch mayor Lianne Dalziel takes an Ohmio Hop ride with Mohammed Hikmet.

without the need for a driver. It will provide services similar to a tram but with virtual rails. It is guided by a range of electronic systems.

Ohmio has been developed by HMI in Pakuranga, Auckland, and launched the first demonstration in Christchurch last September.

Hikmet says the Ohmio Lift is expected to be used in areas such as airports, business parks and central business districts.

"We were proud to have made our first sale to Christchurch International Airport in March."

Hikmet says there's strong interest in the United States and Asia.

Christchurch airport remains on the radar with a launch of the project there likely in July.

Chassis have been welded and assembly starts soon. A Warkworth, north Auckland, firm associated with the America's Cup is involved in helping make the shuttle front and rear ends, expected to take about a month.

Most design features are completed, Ohmio says.

So for Ohmio, this year is definitely seeing a big move on the AV front.

Visit <https://ohmio.com/> for more information. ■



The Ohmio Lift.

Driverless cars could reduce auto insurance: Buffett

The arrival of driverless cars is inevitable – more a case of when.

But what will this mean for vehicle insurance?

Warren Buffett, chief executive officer of Berkshire Hathaway, which owns Maryland-based auto insurer Geico, reckons autonomous ve-



Warren Buffett

hicles could reduce auto insurance premiums, perhaps dramatically.

That's providing driverless vehicles are safer, he says.

"If driverless cars are successful and people don't hack into them, that will reduce auto insurance premiums – and perhaps drastically reduce them," he told *Yahoo Finance*.

The legendary investor says the potential lowering of premiums won't be necessarily bad for business. Car insurance will likely remain as governments require a degree of it in many places. Also, the added safety doesn't just mean cheap premiums, but also cheap pay outs.

"You want safer cars. Safer cars mean lower insurance. Safer driving means lower insurance costs," Buffett told the news website.

The 87-year-old Nebraskan also notes uncertainty still exists around the timeline, which means the insurance business is under little pressure to change. Recent incidents with Uber and Tesla have slowed what had been a surging pace of technological development.

"How fast that comes or anything, I don't know," Buffett told *Yahoo Finance*. "I think it's a long time off." ■



AUTONOMOUS VEHICLES

Taiwan research centre comes up with the goods

This automated vehicle is just one of the products developed by TARC - the Taiwan Automotive Research Consortium.

TARC specialises in developing concepts to the prototype stage, then handing the prototype over to individual member companies to develop further and take it to market.

One such prototype, the intelligent driving vehicle (pictured above), was demonstrated to the media, including *EVtalk*, at last month's Taipei AMPA show, an international exhibition



for auto parts and accessories.

The prototype demonstrated a cheaper automated driving solu-

tion than many developed in other parts of the world. It can be fitted to vehicles for less than US\$10,000, as opposed to other systems costing up to US\$100,000.

In a quick test drive around some of Taipei's busy streets the vehicle showed its safe driving qualities.

The downside? It is accurate only to 30cm compared to much more expensive models which are accurate to 10cm.

But given more research by TARC, the accuracy gap will be quickly closed. ■

Electric entry in Scooter Safari

Darren Keen of DK Motors in Dunedin is riding an electric Niu scooter more than 250km from Christchurch to Hokitika on May 19.

The Scooter Safari event is a coast-to-coast endurance ride to raise funds for the New Zealand Cancer Society. It aims to raise \$211,000 which, over six rides, would help raise a million dollars for cancer research, education and support.

Keen, who runs the sole South Island Niu scooter dealership, says the scooter can carry three batteries which should get it most of the way. One of his team will follow to put in a charged battery if needed, or he can get a top up from a tow truck.

The scooters are limited to a 50km/h top speed, and Keen reckons he can do the trip in five or six hours. Breaks and fuel stops are planned every 50km.

"Arthur's Pass could be challenging," Keen says. But he's already tested the scooter up the world's steepest street, Dunedin's Baldwin Street. "We just got up it," he says.

Keen says he and his team often ride the electric Niu around Dunedin, but



Darren Keen.

usually only up to about 10km.

"Nothing like this sort of range (250km)."

He's well prepared for what could be gruelling journey, especially if it's cold.

"The scooter has a USB port so I can always plug in a heated jacket," he laughs.

Keen says he took up the Scooter

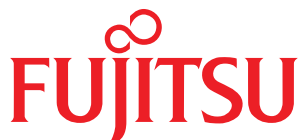
Safari challenge to see how the electric scooter goes over a long distance, and because it's for a good cause.

"The big thing is if people can support us."

Keen says fundraising is going well.

Visit <https://scootersafari2018.everydayhero.com/nz/darren-1> to donate to Keen's cause. ■

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. The Warehouse is among 30 of the country's largest employers to agree on the deal.

A challenge for The Warehouse Group

The shift to an EV fleet has been challenging for The Warehouse Group.

That's the view of its environmental initiatives general manager **Greg Nelson**.

"We're looking at four EVs this financial year to July," he says. That means many more to come to achieve the target in the fleet, which has around 220 vehicles."

The group's main businesses are The Warehouse, Warehouse Stationery, Noel Leeming and Torpedo7, so much of the fleet comprises delivery vehicles – Noel Leeming has about 110 for instance.

A sticking point has been lease pricing, mainly because the high depreciation rates on new EVs are passed through into monthly leasing costs.

To keep costs down, the leasing company involved is being asked to purchase used United Kingdom vehicles, like the Renault Zoe, as depreciation is not as significant.

Other options are electric vans, with the LDV brand possibly being considered in the future now that its LDV has added AC charging to its previously DC only.

Nissan e-NV200 electric vans were also considered but are too small for the size of the goods, like the larger TVs, that need to be transported most days.

"We started looking at electric vans about one and a half years ago, but there were not many options for e-vans then," Nelson says.

He says electric vehicles with good range are usually required for their drivers, especially in the South Island.

"Our first EVs will be pool vehicles, based at our head office in Auckland."

Travelling in an EV in



The Warehouse Invercargill team member Suzanne Miller drives a Nissan Leaf.

some areas where the charging network is sparse can also be challenging, although chargers are rapidly filling the gaps.

The Warehouse Group is also providing charging stations at 11 of its stores, and its Northcote head office has four charging bays.

Stations at The Warehouse are free for a limited time to the public, with access in the future likely to be restricted to an app, with plans to reward charging station users who regularly shop at The Warehouse. Details have yet to be finalised.

About 21 chargers will eventually be established at stores, nearly all part funded through the Energy Efficiency and Conservation Authority.

Nelson says they're focussing on smaller towns where public charging would encourage people to think about purchasing or using an EV.

Chargers in Hastings, Motueka, Blenheim and other town sites are used reasonably well, Nelson says.

The chargers are all three-phase, 22kW AC medium speed with type 2 plugs.

The final 10 or so charging



Suzanne Miller with Invercargill store manager Kelvin Mooney, Greg Nelson and EV driver Mark Nixon.

sites are being finalised and should be in by July.

Nelson says another of the challenges in switching to an EV fleet is the cost comparisons with running a conventional fleet. The group includes the Ford Focus TDi wagon and the Skoda Octavia among its "benchmark" ICE vehicles which have much lower monthly leasing costs to New Zealand new EVs of a similar size.

"This is why we are looking at ex-UK Zoes as these are roughly the same price but a smaller vehicle," Nelson

says.

He's noticed a far more positive attitude towards EV uptake by New Zealanders in the past year, compared with a previous reluctance.

He says a senior executive and two board members had plug in hybrid vehicles, and now six staff members have their own Nissan Leafs.

One further advantage is the electrics get the prime parking spots near the chargers.

Nelson himself plans to get an EV, but for the moment he cycles about 16km one way to work.

No doubt that all helps with the group's aim to reduce its energy use and associated carbon footprint – the target a 32% drop in emissions by 2030.

Electric vehicles are a part of that, and include investing replacing conditions of use under Customer Service, electric vehicle chargers – and replacing LPG-powered forklifts with electric ones. ■

The Warehouse EV charging sites are in Rolleston, Gore, Invercargill, Timaru, Oamaru, Rangiora, Blenheim, Motueka, Taupo, Hastings, Napier, Royal Oak (Auckland).

Other sites selected include Cambridge, Te Awamutu, Te Kuiti, Tauranga, Petone, Hawera, Masterton, Bell Block (New Plymouth), Snells Beach (north of Auckland) and Whangarei.

Twenty of the stations are part funded by the Energy Efficiency & Conservation Authority (EECA).

All chargers are Type 2 sockets, AC three-phase 22kW, two car parks each with time limits applying. Bring your cable.

Visit www.thewarehouse.co.nz for terms and conditions of use under Customer Service, electric vehicle chargers. ■

A mission not impossible with trikes

Luke Davids is "On A Mission".

That's the name of his Auckland-based delivery business which uses electric cargo tricycles (ECTs) and electric cargo vans (ECVs).

He's recently started deliveries in the Auckland central business district, focussing on "last mile" solutions to get around the city's traffic congestion.

On A Mission has two ECTs and one ECV operating there from its Mount Eden base, with two more ECTs arriving soon.

The electric trikes can use cycle lanes and pathways to reach their objective, avoiding much of the traffic and making good time in the process.

Davids says using such vehicles helps avoid some of the "mess" and is a green solution to issues such as pollution, climate change and congestion.

He grew up in the courier, mailing and parcel business, working in all aspects of delivery for about 20 years. "So I came out of a delivery background, as did my partners."

Davids has also had a long interest in technology which helps with delivery, able to track progress and ensure the goods are delivered. He says the tracking is similar to Uber, with artificial intelligence assisting with mapping and a chatbot called "Jenny" interacting with recipients.

He calls his business an "electric powered logistics company".

Davids puts his money where his mouth is on green issues too. As part of the Sustainable Business Network's Million Metres Streams Project, he provides a small proportion from each delivery for the project to restore native bush along New Zealand's waterways.

He reckons that by every 100th delivery there's another tree which can be planted.

Rather than compete against other



On A Mission delivery rider Isaiah Bishop delivers the goods in downtown Auckland via electric cargo tricycle.



Luke Davids.

delivery companies, Davids says he's keen to establish partnerships

with carriers to help where he can.

"Courier companies often have a headache in delivering to apartment blocks and large buildings," he says.

Davids says delivery people may buzz the intended recipient and find they're not there, so have to return or leave messages until the delivery is completed. He says returning to the same building time and time again, even for different recipients, is a drain on time and resources.

Some companies do about 40 or 50 deliveries daily in Auckland, all with diesel or petrol vehicles.

Davids would like to see that change.

A business partner based in the United Kingdom has had considerable experience with deliveries and founded a cargo fleet comprising about 150 EVs.

Davids himself is a successful entrepreneur in that field.

Five years after establishing Access Worldwide in 2007, he was responsible for the UK and European launch of technology and logistics firm I-Parcel.

The business was bought by the US-based parcel giant UPS three years later.

Davids and his New Zealand born wife met in London and lived there for about 10 years before deciding to come to New Zealand with their children.

"I thought I would get into a different job than logistics, but that's where my skills are," Davids says.

Once well established in Auckland, there's a strong possibility On A Mission could be extended to other cities.

He's already saving his "pennies" for an electric truck like a Tesla Semi.

Would Davids use drones in his business? "I've been pretty sceptical of drones actually working in the delivery field with current battery and weight restrictions, but I am coming

around to the idea. We're considering some options at the moment."

One thing's for sure, Davids is definitely on a mission.

"Long-term, we will see the whole country being on the electric network."

Visit www.onamission.co.nz for more information. ■

Sporty Niro EV due next year

Continued from page 1

Kia describes the Niro EV as a sporty and versatile vehicle that combines driving enjoyment with eye-catching design and functionality, while adding a new dimension to the eco-friendly compact SUV market.

It's powered by Kia's next-generation electric vehicle powertrain, using new production technologies developed for Kia electric vehicles.

Equipped with a high-capacity 64kWh lithium-polymer battery pack, the Niro EV is targeting a zero-emission range of over 380km on a single charge, or up to 240km when paired with an optional 39.2kWh battery system.

Kia will introduce the Niro EV to its home market in Korea during the second half of 2018, with other markets, including New Zealand, to follow in 2019. ■

This year's EV target nearly hit

Electric vehicle numbers are already closing in on this year's 8000 target, with 7597 recorded in April.

That's up 365 on the previous month, according to the latest Ministry of Transport figures.

The national EV fleet comprises mainly used light pure EVs with 4074 recorded for April (3829 in March). That's followed by new light pure EVs at 1475 (1423 in March) and new light plug-in hybrids at 1405 (1350).



The new Nissan Leaf, due here in the next fiscal year.

Used light plug-in hybrids recorded 561 in April (549 in March) and heavy EVs increased by one on the previous month to reach 82 in April.

The trend in used light EVs showed in April registrations with 259 compared with 209 registrations in March. A total of 109 new light EVs were registered in

April, a drop on March's 125.

That means overall April registrations stand at 369, compared with 336 in March.

January saw the highest EV registrations so far this year with 416.

Following the April trend, the 8000 EV target could well be reached in May or June.

The Nissan Leaf continues to be New Zealand's leading electric used import. More than 3,250 Leafs are registered

USED IMPORTS APR 2018		
MAKE	MODEL	TOTAL
BEV - BATTERY ELECTRIC VEHICLE		
NISSAN	LEAF	228
SMART	FORTWO	3
BMW	I3	2
NISSAN	E-NV200	2
MERCEDES-BENZ	B250	1
MITSUBISHI	I-MIEV	1
RENAULT	ZOE	1
TESLA	MODEL S	1
TOTAL		239
PLUG IN HYBRID		
NISSAN	LEAF	228
SMART	FORTWO	3
BMW	I3	2
NISSAN	E-NV200	2
MERCEDES-BENZ	B250	1
MITSUBISHI	I-MIEV	1
RENAULT	ZOE	1
TESLA	MODEL S	1
TOTAL		239

here and it enjoys popularity around the rest of the world too.

In excess of 320,000 Leafs have sold world-wide since the model was introduced in 2010. ■

NEW MAKES AND MODELS APR 2018	
MAKE AND MODEL	TOTAL
ELECTRIC	
TESLA MODEL S	18
TESLA MODEL X	12
HYUNDAI IONIQ	10
VOLKSWAGEN GOLF	10
BMW I3	1
TOTAL	51
PLUG-IN HYBRID	
TOYOTA PRIUS	20
MITSUBISHI OUTLANDER	16
BMW I3	4
AUDI A3	3
PORSCHE PANAMERA	3
BMW 2 SERIES	2
HYUNDAI IONIQ	2
KIA NIRO	2
BMW I	1
MERCEDES-BENZ C-CLASS	1
VOLVO XC60	1
VOLVO XC90	1
AUDI Q7	1
TOTAL	57

Load ranger - we test the LDV EV80

Continued from page 3

minibus conversion package is available, while you can also order it in a cab-chassis format. This is the basis for an electric campervan project – again with EECA funding – built in Auckland by Action Manufacturing.

Are there savings?

There is no getting away from the price of the EV80 – \$69,990+GST, so a little over \$80,000. This is nearly double a diesel 'Bigger' LDV V80. The cab chassis is \$64,990+GST and the PSV-compliant minibus \$86,500+GST. Charging for 20,000km of driving will cost around \$930 at 15 cents a kW/h. For now, the government is letting you skip the Road User Charges, at least until 2020. The diesel version of the van will cost \$4110 for fuel and RUC over the same distance. Nor is there an engine to service, so cross that off the list as well.

On fuel alone, payback for the pur-

chase price difference is a smidge over 200,000km – a distance not unheard of for a delivery vehicle like this type to travel.

For many fleets, the argument over the move to electric being visible will come down to more than just hard operation numbers. Being green, and particularly the reduction in carbon is becoming a key corporate metric.

The EV80 fits this image well, and the fact that it is here years before another large van option gives, somewhat cynically, the best return on this.

For a commercial operator, there is the possibility of seeking assistance with getting a fleet of EV80s on the road. Already money had been provided by the Energy Efficiency and Conservation Agency to the adoption of van fleets.

Good enough, for now

The EV80 may not be perfect, it is based on an old and basic van design

while drivetrain refinement could be better – and operators will need to carefully plan how they intend to keep it charged and ready for work. It arguably does not have the safety credentials and comfort features of large European vans, but this has yet to put off some operators.

Still, it does its job very well, and with a very usable range should appeal to operators who want to not only save on operating costs – but push the right image while they are at it. ■

Enquiries for the EV80 should be directed through Warren Willmot, aka "The Van Geek", at LDV/ Great Lake Motor Distributors, 162 Great South Road, Takanini, Auckland. Email warren@glmd.co.nz, phone 021 949 218, or visit ldv.org.nz for more information.



EV TALK DIARY

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



April 3

Men miss the vroom-vroom

Buying an electric vehicle doesn't seem to do much for some men's macho image.

The roar of an internal combustion engine (ICE) is apparently more manly than the quiet, powerful serenity of an electric engine which appeals more to women.

That was a common opinion in the latest poll from Flip the Fleet which asked EV owners to comment on whether men and women are equally likely to switch to an EV.

April 4

EVworld Conference in north and south this year

Challenges to achieve the government's target of 64,000 electric vehicles (EVs) by 2021 will be among topics at the upcoming EVworld Conference.

This year the conference is being held twice – in the North Island on August 10-11, and the South Island on November 23-24.

Conferenz will host the conference and expo at the ASB Showgrounds in Auckland, EVworld South then being held for the first time, in Christchurch at the Airforce Museum.

Kiwis urged to be world EV leaders

Meridian Energy is asking Kiwis to take on world electric vehicle leader Norway.

Nearly a third of all cars sold in Norway are either fully-electric or hybrid, so Meridian encourages New Zealanders to participate in an EV future.

"The recent uptake we've seen in New Zealand is pretty

impressive, but we know that there is more we can do to reduce emissions," Meridian chief executive **Neal Barclay** says. "Our campaign is encouraging New Zealanders to get involved in moving the country forward to an electric car future."

April 6

Electric vehicle boost from fuel levy

The proposed fuel levy may accelerate demand for electric vehicles, industry experts say.

It could also boost charging infrastructure.

A new nationwide fuel tax proposed by the Government will see motorists pay up to 9 to 12 cents per litre more at the pump.

Automotive workshops get EV courtesy cars

Electric courtesy cars have begun arriving at the first of 25 automotive workshops around the country.

Sonter Automotive in Christchurch is among the early recipients, along with Papamoa Automotive Service Centre in Tauranga and Goodhue Automotive in Hamilton.

EVincible was provided with \$263,450 for the courtesy cars in the Energy Efficiency and Conservation Authority (EECA) low emission vehicles contestable fund third round.

April 9

EV numbers continue climbing

Like yeast, electric vehicle numbers in New Zealand continue to rise.

EVs here hit 7233 in March – 333 more than the previous month.

At this rate EVs should

reach the 8000 end-of-year target in about May, more than six months early.

April 16

EV buses set for Auckland

Auckland Transport has launched its first electric buses.

Two EV buses were unveiled at Queens Wharf today by Auckland mayor Phil Goff and associate transport minister Julie Anne Genter.

The vehicles will operate on the City Link service from next week.

EV selection set to soar

New electric vehicles will hit the market at a rapid pace over the next two years, non-profit group Drive Electric says.

That is because the push towards electrifying the world's vehicle fleet is gathering momentum, with many countries setting deadlines of between 2030 and 2040 to end the sale of new internal combustion engine (ICE) cars.

Drive Electric board member **Dean Sheed** says original equipment manufacturers (OEMs) have been pouring money into electric and autonomous vehicles to keep up with the deadlines.

April 17

New Zealand businesses preparing for EVs

New Zealand businesses are increasingly embracing more sustainable transport options to get their employees from A to B.

Businesses are safeguarding their future by adding a small number of electric vehicles (EVs) to their fleets – preparing for when EVs could be the norm, says specialist vehicle leasing and finance company Driveline.

Its latest figures show 286% growth in the first quarter of this year, compared to the first quarter of 2017.

April 19

NZ driverless vehicle adoption requires law change

Law changes are needed soon to ensure driverless vehicles can be used legally on New Zealand roads, a New Zealand Law Foundation study concludes.

Study author Michael Cameron says a complete overhaul of law and policy around driverless vehicles is required.

New Zealand can afford to take time to get the comprehensive change right, but some targeted reform is needed more urgently, he says.

April 20

Auckland sets cycleways record

Auckland's cycleways were used more in March than ever before.

Electric bikes are contributing to the 50,000 more trips taken then.

A record breaking 430,000 rides were recorded in March, up 13.5% on the previous year, according to data collected by Auckland Transport, the *New Zealand Herald* reports.

April 26

Local autonomous vehicle firm in Korean deal

New Zealand-developed autonomous vehicles could be shuttling Koreans around a future city following a deal signed today.

Ohmio Automation Ltd, a subsidiary of the HMI Group, has signed up to supply 150 Ohmio autonomous shuttles to the Korean company, Southwest Coast Enterprise City Development Co Ltd (SolaSeaDo) – assuming the development goes ahead.

The agreement was signed by Mohammed Hikmet, the founder of HMI Group and SolaSeaDo president Yoon,

Continued on page 27

Continued from page 26

Jin Bo. SolaSeaDo is in the advanced stages of securing a contract to build a large scale smart city in Korea and will know later this year if it has been successful.

Electric X3 to come here from China?

An electric version of BMW's X3 SUV has been revealed, with production set to start in 2020 – and the NZ version could be coming from China.

The new version of the popular midsize SUV promises 200kW of power, and a range of around 400km from a 70kWh battery pack. The iX3 is capable of fast charging at up to 150kW – which will allow for a fill in just 30 minutes if such chargers were to come to New Zealand.

Stop war – drive EVs

Driving an electric vehicle can help the world avoid war.

That's one unexpected response to a Flip the Fleet poll

on reasons for people buying an EV.

"Oil played a huge part almost all wars since WW2," the respondent says. "The Syrian war today is an oil war," referring to the way both the West and Russia have an interest in oil pipelines going through Syria.

April 27

\$28b Auckland transport package has little for EVs

A \$28 billion programme to improve Auckland's transport and ease congestion over the next decade has little for electric vehicles.

The packages are all about trying to decongest Auckland rather than switching motive power, Drive Electric board member and Audi New Zealand general manager Dean Sheed says.

"However, as a by-product (either strategic or by chance)

the double whammy on fuel taxes will drive more people to consider electric vehicles as a viable alternative for obvious reasons."

'Feebate' to subsidise electric vehicles?

Importers of gas guzzling vehicles could be hit with extra fees in an effort to subsidise electric vehicles if new proposals are adopted.

The Productivity Commission has proposed introducing what it is calling a "feebate" on vehicles that use large amounts of fossil fuel, in its Low Emissions Economy draft report.

High-emission vehicles would incur a fee, while low-emission vehicles like EVs would receive a rebate, the report says.

April 30

Bus charged in eight minutes

A charging station which can fully power up an electric bus in eight minutes will be installed in Wellington this June.

Costing about \$1.5 million, the Island Bay station is considered the fastest charger in New Zealand and the only one of its kind in the country, *The Dominion Post* reports. ■

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EV TALK DIARY

EVtalk Australia editor

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



April 11

Global recognition for Australian EV battery repurposer

Australian company Relectrify has been recognised globally for repurposing old EV batteries for household power.

It was the only Australian company recognised as one of the top 15 global start-ups by energy technology accelerator Free Electrons, a group linking utility companies with new energy tech businesses, *The Sydney Morning Herald* reports.

April 17

ACE plans electric car making in

Australia

ACE aims to release its first Australian-made electric car by the third quarter of the year.

Two models are in the pipeline – a ute dubbed the Yewt, and a cargo van.

Australia has only about 4000 electric cars on the roads, and ACE would be the first Australian-made battery-powered car makers manufacturing in Australia.

April 19

ACT to act on EVs

An ACT action plan for moving to zero emissions vehicles has been released.

The *Transition to Zero Emissions Vehicles Action Plan 2018-2021* includes

incentives for using electric bikes and aims to have half of newly leased ACT Government fleet passenger vehicles zero emissions by 2019-20 – with all zero emissions by 2020-21 (where fit for purpose).

Electric vehicles and hybrids will be allowed in transit lanes from later this year until 2023, and all new multi-unit and mixed-use developments in Canberra must install charging stations.

April 20

EV uptake forecast doubled: AEMO

Electric vehicles could make up half of Australia's car fleet within 20 years.

That's the reasoning from the Australian Energy Market Operator (AEMO) which has effectively doubled its forecast uptake for EVs here.

April 24

Townsville "giga-factory" a step closer

A lithium-ion "giga-factory" in Townsville capable of producing 250,000 electric vehicle batteries annually is a step closer to fruition.

The Imperium3 consortium behind the proposed battery plant has brought global tech giant Siemens in on its plans, *Renew Economy* reports. ■

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EV CHARGING LOCATIONS

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FORWARD TOGETHER

Fast / Super Charger Locations – North Island

Kaitia	Te Ahu, 28 South Rd	Ruakura	Waikato Innov. Pk, 9 Melody Ln
Kerikeri	1 Butler Rd	Raglan	43 Bow St
Kaikohe	Library Carpark, 14 Marino Pl	Mt Maunganui	Bayfair, 19 Girven Road
Kawakawa	4 State Highway 1	Mt Maunganui	New World, 1 Tweed St (25 kWh)
Whangarei	Paramount Plaza, 1 Wanaka St	Cambridge	73 Queen Street
Tikipunga	11 Alexander St	Te Awamutu	10 Scout Lane
Raumanga	McDonalds, 130 Tauroa St	Whakatane	i-Site, 30 Quay St
Dargaville	Totara St Park, 113 Totara St	Opotiki	i-Site, 70 Bridge St
Kaiwaka	1 Kaiwaka-Mangawhai Rd	Te Kaha	Te Kaha Bch Res, 3 Hotel Rd
Warkworth	New World, 6 Percy St	Rotorua	1134 Haupapa St
Warkworth	BP, 67 Auckland Rd (SH1)	Matawai	6522 Matawai Rd
Orewa	New World, 11 Moana Ave	Tolaga Bay	43 Cook St (25kWh charger)
Silverdale	17 Hibiscus Coast Hwy	Te Kuiti	New World, 39 Rora St
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	Rangitiki	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	Te Haroto	Mc Vicar Rd, 4237 SH5
Botany Downs	Z Station, 550 Te Irirangi Dr	Waiouru	Cnr SH1 & Hassett Dr
Akld Airport	Shopping Ctr, George Bolt Mem. Dr	Hawera	Pak'n'Save, 54 Princes St
Akld Airport	Z Skyway, George Bolt Mem. Dr	Napier	206 Dickens St
Takanini Vill.	30 Walters Rd	Hastings	100 Queen St W
Coromandel	44 Woolams Rd	Mangaweka	2 Koraenui St
Whitianga	4 Lee St	Waipukurau	34 Russell St
Tairua	Carpark, 6 Tokoroa Rd	Dannevirke	24B Gordon St
Pukekohe	King Street Carpark, 56 King St	Woodville	i-SITE, 43 Vogel St
Pukekohe	Counties Power, 14 Glasgow Rd (Bus hrs)	Palmerston Nth	i-SITE, 126 The Square
Thames	505 Mackay Street	Palmerston Nth	Tesla, 365 Ferguson St
Whangamata	100 Hetherington Road	Otaki	155-163 Main Hwy
Te Kauwhata	16 Wayside Rd	Masterton	3 Dixon St
Waihi	New World 35 Kenny St	Porirua	2 Serlby Pl
Te Rapa	WEL Networks, 114 Maui St	Featherston	SuperValue, 42 Fitzherbert St
Hamilton	Tesla, The Base, Te Rapa Rd	Upper Hutt	24 Queen St
Hamilton	Caro St Carpark, 7 Caro 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



Fast / Super Charger Locations – South Island

Takaka	16 Willow St	Rakaia	41 Bridge St
Nelson	Millers Acre Carpark, 37 Halifax St E	Ashburton	109 West St
Richmond	Library, 11 Mcglashen Ave	Tekapo	Lake Tekapo Tavern, SH8
Greymouth	13 Tarapuhi Street	Fairlie	Opp. 53 Main St
Kaikoura	51 West End	Geraldine	Cox St Carpark, 14 Geraldine-Fairlie Hwy
Culverden	27A Mountain View Rd	Twizel	Events Ctr, 61 McKenzie Dr
Amberley	Countdown, 123 Carters Rd	Timaru	26A North St
Northwood	New World, 2 Moulder Ave	Omarama	2 Sutherland Rd
Harewood	Raeward Fresh, 800 Harewood Rd	Kurov	Wynyard St
Addington	Z Station, 40 Moorhouse Ave	Wanaka	42 Ardmore St
Halswell	New World, 9 Nicholls Rd	Frankton	302 Hawthorn Dr
Rollerton	New World, 90 Rollerton Dr	Cromwell	i-Site, 2 The Mall
Lincoln	New World, 77 Gerald St	Waimate	125 Queen Street
Little River	4235A Christchurch Akaroa Rd	Oamaru	Eden St Carpark, 3 Eden St
		Ranfurly	31 Christchurch St E
		Alexandra	9 Thompson St, Bridge Hill
		Hampden	33 Lincoln St
		Dunedin	Filleul St Carpark, 193 Moray Pl
		Milton	Four Square, 207 Union St
		Roxborough	22 Jedburgh St
		Lawrence	Four Square, 19 Ross Pl
		Winton	New World, 293 Great North Rd
		Gore	New World, 8 Irlk St
		Balclutha	23 Charlotte St
		Invercargill	116 Esk St