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Smarter power pricing needed for EVs

A rapid mass uptake of EVs could overload New Zealand's electricity network, two recent reports warn.

Research released by Concept Consulting says New Zealand will need to develop smarter electricity pricing options for consumers charging EVs as mass uptake happens.

The report, sponsored by electricity distributors Orion, Unison and Powerco, studies the long-term implications of EVs, including the need to develop smarter, more cost-reflective electricity prices specific to EV charging.

Concept director **Simon Coates** says under existing pricing, EV uptake will be held back and electricity supply costs will be higher than they need to be.

"Without electricity pricing reform, our research shows costs to consumers could be higher by about $4 billion over the next 30 years, and vehicle emissions more than one-third greater in 2050."

Coates says the benefits of EVs could be better realised under a new approach to pricing that rewards consumers for charging their vehicles in a smarter fashion.

"Smarter charging can be achieved by rewarding consumers for charging in off-peak periods – such as 10pm to 6am - and using 'managed charging' options to stagger charging among households."

That would make it cheaper to charge EVs and help avoid significant network investment upgrades.

The report notes that if all light private vehicles were changed overnight to EVs, annual residential electricity consumption would increase by about 50%.

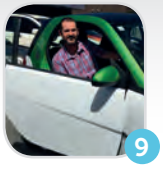
Lines company Vector has released a 26-page "green paper" report on EV network integration, advocating the need for a robust strategy to deal with EV uptake and its impact on electricity supply.

Commenting on the Concept Consulting report, Vector strategic planning and technology integration adviser **Steve Heine** says cost-reflective pricing is an important tool to support EV integration and help customers make more informed decisions.

"However, EV charging behaviour is influenced not just by pricing but also convenience, daily routine, charging

Continued on page 8

INSIDE



Evie's a top model

Evie the plug-in electric 1957 Ford Fairlane is on tour.

The converted classic car will be at shows and events throughout the country as well as featuring on social media, tv and in advertisements as Mercury's poster child for EVs.

She still looks like a 1957 Ford Fairlane, it's just that the power plant under her bonnet has a 170kW Siemens electric bus motor run by 218 batteries.

OK, so the fuel gauge is no longer relevant – for obvious reasons. But everything looks original and it's nearly all painted in Mercury's bright yellow, complete with a few bees.

Even the fuel cap opens to reveal a Chademo fast charge port, with Evie also having 10amp household and 32amp three-phase plugs.

Evie is a head turner. That much was apparent when her "minder" Mike Tripp took the *EVtalk* team for a spin.

The top was down for the cruise in Auckland – it can even retract or come up on the road. Waves, toots and calls came from all directions.

Tripp, or "Trippy" as he's known, has long had an interest in vehicles and provides a variety for filming. He was contacted to help organise Evie's conversion from gas guzzler to electric.

About 15 to 20 people through-

Continued on page 6

EVtalk

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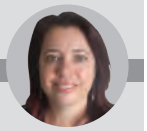

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DRIVE ELECTRIC

The PM wants an EV

Jacinda Ardern would love an EV.

The Prime Minister told *EVtalk* she wants one after she launched Yoogo Share, New Zealand's first fully battery powered electric car-sharing service, in Christchurch.

Asked what sort of vehicle she'd like, Ardern says she doesn't want to endorse any particular brand by revealing a preference.

She is keen to set an example though and believes the Labour-led coalition Government will stick with the aim of converting as much of its fleet as possible to electric.

Officially opening the car-share service at the Christchurch Art Gallery with Christchurch mayor **Lianne Dalziel** before about 200 guests, Ardern received a baby's stretch-and-grow as a gift from Yoogo Share general manager **Kirsten Corson**.

It was inscribed with the phrase "Sharing is caring", although Corson said, tongue in cheek, they had considered "My mother went into Labour" and "Plug me in"!

Ardern says she's been getting many baby related gifts after her announcement in January that she and partner **Clarke Gayford** are expecting their first child in June.

Jacinda Ardern and Lianne Dalziel.

Adern, who learned to drive on a Massey Ferguson tractor, says she sees the potential to expand New Zealand's clean, green slogan to include "carbon neutral" (New Zealand aims to be carbon neutral by 2050).

Christchurch City Council and Yoogo Share are "leading the charge in this area", she says.

The car-share scheme is among ways of encouraging New Zealanders to also change their transport options, Ardern says.

"We're seeing Christchurch fly the flag with 100 EVs driving around the city."

All the cars have first names, mainly after the people involved with the service - and one is named "Jacinda".

The council initiated, researched and developed the battery electric car-sharing scheme for Christchurch organisations and for the public, mainly through its resource efficiency manager **Kevin Crutchley.**

Continued on page 8

Honours for car share supporters

A Yoogo Share EV is named "Malcolm" after Christchurch Airport chief executive **Malcolm Johns**.

The airport is trialling the Yoogo Share service for about six months, with the aim of establishing a "flexible fleet" able to be used by staff as well as the public.

"We're keen to have staff take them home for a weekend and try them out," Johns says.

The airport also hopes to have the Ohmio autonomous shuttle trial running in July or August (see P20), operating around the terminal and carpark private roads and linking with other transport services.

Johns is among the 12 Yoogo Share foundation partners and others who received certificates in appreciation of their support.

Andy Sinclair

The partners include the council, the Ara Institute, Aurecon, Beca, the Canterbury District Health Board, Chapman Tripp, Environment Canterbury, Jacobs, Meridian Energy, Tonkin and Taylor, and Warren and Mahoney, the scheme run for them by Yoogo Share.

Andy Sinclair accepted a certificate on behalf of Hyundai Motors NZ for the car-share's Ioniqs and **Florian Renndorfer** received one for BMW Group New Zealand for the BMWi3s.

The Christchurch Agency for Energy Trust was a foundation funding supporter for the service, providing a grant towards the electrical and charging infrastructure for the hub roll-out.

And the Energy Efficiency and Conservation Authority (EECA) provided funding towards stage two of the service through its low emission vehicles contestable fund. ■

Bright future for Kia's electrified SUV

The relationship between Kia, Korea's oldest automotive brand, and the Hyundai Motor Company that absorbed it two decades ago is typified by the twin-towered corporate headquarters of HMC in Seoul.

The smaller tower is occupied by Kia, the higher one dedicated to Hyundai. Consider it concrete proof that where Hyundai goes, Kia always follows.

That includes entering the electric vehicle arena, something that Kia NZ has just done for the first time with the launch of the new Niro compact SUV range.

Hyundai Automotive New Zealand introduced a comprehensive range of similar electrically enhanced Ioniq vehicles last year, giving buyers the choice of three new alternative powertrain technologies.

There was a parallel hybrid using a 77kW four-cylinder petrol engine primarily for its motivation, a plug-in hybrid that could provide more than 60km of whispering travel between connections to the grid before igniting its accompanying combustion engine, and a fully electric Ioniq that could roam for 200km-plus between recharges.

It's a highly promising line of environmentally responsible cars that hasn't really lived up to its sales potential in this country, despite good reviews.

HANZ sold just five of the most-affordable Ioniq model ($46,990) with the parallel-hybrid powertrain in 2017. Will the same Kiwi market indifference affect the mechanically similar Niros?

Kia New Zealand managing director **Todd MacDonald** says the Niro's SUV-like design will make all the difference.

Although the Niro has no off-roading abilities and is driven by the front wheels only, MacDonald says it has a "shape" that is currently in vogue.

"All of New Zealand is taking to the small SUV, which makes the success of the Niro a surety.

"By the end of the year it'll be New Zealand's best-selling hybrid SUV."

To do that, the Niro range needs to beat both the best-selling plug-in hybrid SUV (the Mitsubishi Outlander PHEV) and the best-selling parallel-hybrid powered range (the Lexus 300/400).

Fortunately, affordability will be on the side of the Niro. The base parallel-hybrid model, the Niro HEV EX, is expected to list for $39,990 later this year.

It launches with a $5000 incentive at $34,990, and includes a three-year free servicing plan, five years of roadside assistance, and a seven-year warranty for the 1.6kWh battery.

That's a launch price position that places the Niro HEV EX right in the sweet spot of the compact SUV segment, the mid-thirties, where most brands are opening their sales negotiations with customers.

It's a segment dominated by a gang of five – the Mitsubishi ASX, Nissan Qashqai, Mazda CX-3, Suzuki Vitara and Honda HR-V. Yet the Niro EX has several trump cards to play when comparing it to these.

Its equipment levels are relatively high with cellphone projection to the central touchscreen (Apple CarPlay and Android Auto), autonomous emergency braking, rear-view camera and smart camera-enhanced cruise control along with some of the most voluminous passenger and luggage space in the segment.

Although 125mm shorter overall than Kia's mid-sized Sportage, the Niro has a wheelbase stretched 30mm further apart, blessing the interior with a roominess not usually associated with small SUVs.

The smallest battery in the model range means the EX can have a lower luggage bay floor, allowing 401 litres of stuff to be stashed behind the rear seat or 1399 litres of luggage room with the second-row seating folded away.

Thanks to New Zealand-specific changes to larger-diameter rear disc brakes and larger radiator cooling fans, braked trailer towing capacity is also competitive at 1300kg.

The Kiwi distributor's request to the factory for more tow shows just how keen Kia NZ is to present the Niro to the buying public as an SUV rather than as an electrified hybrid vehicle. And it is also reflected in the driving experience of the EX.

As the lightest vehicle in the range, the EX comes the closest of any new Niro to driving just like its controlled-explosion competitors.

Parking and crawling along can be done just using the 33kW/170Nm electric motor alone and when getting off the line, the accessible torque of the electric motor snuggled between a 1.6-litre direct-injection four-cylinder petrol and a six-speed twin-clutch gearbox gives the Niro an extra nudge forward denied to its combustion-only rivals.

At open road speeds, the electric motor and the attendant 64-cell, 33kg battery under the luggage bay floor mostly become ballast but, at least in the battery's case, it is ballast well located.

Most drivers will feel right at home, enjoying hushed wind noise levels, ride quality that lasts over a wide range of speeds and, most of all, extremely satisfying fuel economy.

Used round town where the hybrid powertrain has most advantage, the EX will return fuel use figures close to the advertised 3.8 litres per 100km. Expect extensive open road use to add a litre to that figure every 100km or so.

Continued on page 25

A drop of ingenuity to help save the planet

Ira Munn's vision of a low-cost kitset electric single-seater is taking shape.

Munn explained his Auckland-based company Ierospace Industries International's plans to build the "Drop" from recycled plastic drink bottles using hardener additives and a 3D printer to an "Accelerator" student class at nearby Ormiston Junior College.

A prototype of the tear-drop shaped car (hence the name) should be ready by October and delivery of the kitset to customers could start in early 2019, Munn says.

The group of 24 students aged 11-14 were among the first in New Zealand to see a device critical to the Drop's function.

The "efficiency circuit", as Munn calls it, is a box sent from Los Angeles which amplifies power safely.

A demonstration to the students certainly got their attention as Munn hooked up eight AA batteries equalling 12 volts to the small box and a 100W LED light to produce a near-blinding light.

"This is considered impossible as the 100W LED usually needs more than 24 to 36 volts to light up," he says.

Munn then held the light and attached cables under water to show the device is unaffected by water and doesn't cause a shock. The light also produces no detectable heat.

The device was developed by **Andre Williams** of Regenerative Electrical Power Systems (REPS), a Los Angeles subsidiary of Ierospace.

It's possible the efficiency circuit could be licensed for use in other areas.

Ira Munn with the "efficiency circuit" at Ormiston Junior College.

Ormiston principal **Luke Sumich** suggested the light would be good for night fishing on his boat.

Meanwhile, Munn says the 3D printer that will produce the Drop's body will be finished after the company's next funding round closes in a few weeks.

A model for the Drop's body is already available. A "California Commuter" chassis has been provided by American aerospace engineer and inventor **Douglas Malewicki** who has met with Munn several times, the latest at a recent conference in New Zealand.

Malewicki developed the three-wheeled fuel-powered car in the 1980s and helped Munn with the Drop, which uses electric power to drive the rear wheel.

Munn told the students the Drop would be strong, safe and legally able to travel on motorways at up to about 110kmh. He expects the kitset to cost about $10,000 with customers able to assemble it in under 20 hours without technical expertise.

After trialling the Drop in New Zealand, Munn plans to export it worldwide, particularly to India, Indonesia where many use motorcycles, China, Thailand and other countries, possibly under licence.

"We could even get people to put their own designs on a website and they could then go to their nearest Ierospace facility where it would be built."

Munn also hopes to use solar panels on vehicles.

One of the key reasons for developing the Drop is to recycle plastic and prevent it getting into the environment and even the food chain, Munn told students.

"it's a real issue," Munn says, describing the great rafts of plastic filling parts of the ocean, a problem the Volvo Ocean Race is highlighting during its Auckland stopover until March 18.

Munn says even when the Drop reaches the end of its useful life it can possibly be recycled.

"We want to chop it up and use the plastic for another vehicle or something else."

His story featured in the EVtalk September 2017 issue. ■

Electric action at Covi SuperShow

Electric bikes will be a big part of the **2018 Covi Motorhome Caravan and Outdoor SuperShow in Auckland on March 16-18.**

More than 12 separate e-bike displays will feature in the annual event at the ASB Showgrounds, Greenlane, which attracts around 19,000 visitors.

David Culpan

The popularity of e-bikes means this year space has been dedicated especially to them, show organiser Spot On Exhibitions managing director David Culpan says.

The electric theme continues with SupaScoota offering electric scooter hire. See Alan in the foyer outside Hall 3 to book a scooter or visit **www.supascoota.co.nz** for more information.

Among the many free seminars is an introduction to e-bikes and another on electric cables.

The seminars cover the different e-bike types and systems, including electric motor quality, software updates and what to look for when buying an e-bike.

Whether any electric campervans and motorhomes make the show has not been determined.

Jucy is trialling a prototype electric campervan which has been taken on an EV tour of New Zealand by two French students (see P4) so it might be unavailable.

Culpan is aware that several large operators are experimenting with both electric, solar and hybrid powered vehicles.

"It is only a matter of time before we see them at the Covi SuperShow," he says.

Electric scooter hire is offered.

He's hoping an electric motorhome might be available from one of the largest exhibitors, Tourism Holdings.

Solar power displays are also expected.

The Covi SuperShow is the third largest at the ASB Showgrounds behind the Auckland Home Show and the New Zealand Boat Show.

"It's very popular with all ages," Culpan says.

The eighth Covi SuperShow will see two new halls and an extra marquee added. Stall space was at near capacity nearly a month before the event so organisers had to open up additional space.

Other show features include daily no-reserve auctions, including a $63,000 Bailey caravan being auctioned for no reserve, a Stop & Stay zone with destinations to explore and Derek the Chef cooking holiday-friendly meals in a motorhome kitchen.

A full programme will be available at the gates which will be open 9am-5pm daily.

Visit **www.supershow.co.nz** for more information. ■

Evie's a top model

Continued from page 1

out the country were involved in the transformation, from auto electricians to panel beaters and painters.

All the work was done in under six months, even though many parts had to be made or adapted.

"Nothing's off the shelf," Tripp says.

The story of Evie's transformation features in a video made by Mercury, which has long been promoting the benefits of EVs to Kiwis.

"This car is the true embodiment of energy freedom, and a symbol of our escape from fossil fuel reliance," Mercury chief executive Fraser Whineray says.

"To have everyone enjoying emission-free vehicles would be wonderful for our country."

So what's the verdict on Evie after all the work? "It goes very well," Tripp says.

Evie weighs 2.2 tonnes, the batteries accounting for about 400kg. As a classic, she's exempt from some of the more modern requirements but had to comply with the latest rules around braking.

The EVtalk team goes for a spin in New Zealand's newest EV.

"We dialled up the regenerative braking so that there's more braking power than required," Tripp says.

Evie got up to around 120kmh (75mph on her speedo) in track testing at Pukekohe and can get to 100kmh in 9.11 seconds, Tripp says.

But built for comfort rather than speed, Evie will be spending most of her time cruising. ■

The PM wants an EV

Continued from page 3

He managed the city-wide project and has a car named after him too.

"This is an exciting new transport service powered by electricity largely generated from renewable energy," Crutchley says.

"The result is a service with zero tail-pipe emissions that will both reduce our city's greenhouse gas emissions and improve air quality, which will have positive health benefits for city residents."

The service can be accessed by businesses and the public, he says.

"This service also allows people to affordably try out new EVs."

The council developed the city-wide hub concept and worked with owners to make the hubs available for the service.

It then partnered with a cross-section of public and private sector organisations to seek a car-sharing service.

Crutchley also helped secure 12 business partners, the foundation members, for the venture and more are now expected to join.

Yoogo Share was selected to develop the offer which began with the foundation members. It's now registering other businesses as well as the public.

Yoogo Share EVs will be based at more than 10 hubs across the city, initially starting with users picking up and dropping off at the same hub. A pick-up and drop-off to different hubs is planned in the future.

Yoogo Share Hyundai Ioniqs and BMW i3s are now available from hubs including the Christchurch Art Gallery carpark, West End carpark and Christchurch International Airport.

In March, hubs will open at The Crossing car park, Ara Institute, Papanui and Fendalton libraries and Lyttelton Community Centre.

Canterbury University, The Terrace and Lichfield Street carpark will follow.

The business will also extend the offer to Auckland and beyond.

Corson says sustainability is an important part of Yoogo Share's business, and providing access to EVs helps Kiwis go green.

"While electric vehicles are increasing in popularity, they can be challenging to adopt because of the extra cost of the vehicles, not to mention costs for chargers and installation.

"Sharing is a great way to enable the benefits of an EV without the hassle or cost."

Corson says Yoogo Share's world-leading technology means Christchurch residents and businesses can contribute to a more sustainable future and a smarter city.

Dalziel says the city is among the few worldwide to have a battery electric car-sharing service.

She says it's as much a part of the city's regeneration after the February 2011 earthquake as any project envisaged, and puts sustainability to the fore.

"This service will deliver improved environmental and health outcomes, and help the council achieve its goal of becoming carbon neutral by 2030.

"It's a smart and sustainable way for businesses and residents to get around town – this is the way of the future."

And, yes, a car bears her name as well. ■

Smarter power pricing needed for EVs

Continued from page 1

technology and electric range, so pricing is not a panacea for EV integration.

"Most importantly, the low-voltage network, where most EV owners connect when charging at home, can be constrained much earlier than the rest of the electricity system so we will need to look for a wider set of options."

Faster charging of larger capacity batteries for longer range EVs and "clustering" of chargers in some areas necessitate the need for EV charging strategy that is future-proof, he says.

"The perception that networks can absorb the uptake of EV charging is only true for the short term while batteries have a short-range capability, customers are satisfied with long charging times and chargers are evenly distributed across the network."

Managed charging empowers customers to actively participate in the market as they react to higher market prices by adapting their charging behaviour, Vector says.

"The local electricity network was not designed for, or envisaged, any significant uptake of EVs and the consequential demand for charging at home.

"Larger batteries, combined with customer demand for shorter charging times and increased affordability of high capacity chargers, mean a single EV household has the potential to increase its electricity capacity needs between 100% for very slow trickle charging and 2000% for rapid charging - essentially adding one to 20 additional 'homes' in terms of network capacity.

"Clustering" EVs in suburbs could bring forward constraints on existing network investments and households buying more than one EV could magnify the problems."

Many electricity companies are already offering pricing plans for cheaper overnight electricity that encourage EV users to charge in a smart way, the Electricity Retailers Association says.

Mercury offers a package that discounts an EV user's entire home usage between 9pm-7am by 20%. Meridian's package includes cheap rates on an EV user's entire home usage, also 9pm-7am.

Genesis Energy offers off-peak rates for EV users, Flick Electric provides spot pricing that gives access to the overnight wholesale market, and ChargeNet is exploring time-of-use pricing at its stations to further incentivise off-peak charging.

Data in recent reports reinforces that there is plenty of current capacity to handle a significant expansion of EV ownership and charging, a Mercury spokesman says.

Mercury's own data suggests EV drivers respond well to price signals.

"So that is the most obvious mechanism for encouraging off-peak charging," it says.

Visit **www.concept.co.nz/publications.html** and **https://www.vector.co.nz/articles/ev-network-integration** to see the reports. ■

Metro Christchurch gets Smart

Chris Nichols is getting Smart at his Metro Christchurch dealership.

In fact, he'll have even more Smarts soon – that's as in the Smart Fortwo (for two people) electric drive car.

The third-generation Smart electric drive (ED) has a 55kW electric motor with a 17.6kWh battery pack.

Metro has three of the Smart EDs – plus a fuel one, which feature alongside other electrics, hybrids and petrol cars at the Upper Riccarton dealership.

Chris Nichols


Smart interior.

The yard has only had about four Smart electric cars before now and a few petrol ones as well.

Nichols says although few Smarts come up for sale in Japan, he always keeps an eye out for them.

The Smart EDs are suitable for Type 2 charging, similar to a Nissan Leaf, so they can be charged up at home or at supermarkets like New World.

They take about four hours to charge fully, ranging from about two hours on a medium charger to seven hours on slow.

The Smart electric (the two-seater hatchback is made by Daimler AG's Smart division – hence the name) has a range of around 120km-140km.

It's primarily designed for urban driving.

The Smart's beginning is attributed to Swatch watch inventor Nicolas Hayek who wanted a fuel efficient, environmentally responsible small car that would fit in small parking spaces.

Now marketed in more than 46 countries, the Smart is especially suitable for empty nesters and senior folk to get around town.

Nichols first saw the cars come up for auction in Japan and says the electric version provides an alternative to other EVs on the market.

The near-new cars are quite a bit cheaper too, at around $18,000 to $20,000.

The Smart EV is easy to drive, with dashboard-mounted gauges clearly showing battery power and energy use - the latter a bit like a rev counter.

Steering wheel paddles provide three modes of regenerative braking.

Stalks for the lights, wipers and other functions are simple and within easy reach.

The two high-backed seats are very comfortable and there's enough room in the boot for the shopping.

It has plenty of zip – it's able to hit nearly 100kmh in just over 11 seconds and is likely to reach a top speed of 130kmh.

Safety is good too. The Smart has a high safety rating and front and side airbags are included.

"They're ideal for Christchurch city as it's mainly flat and everything is within a 30km radius," Nichols says, adding that Christchurch has a high interest in EVs, particularly as the Christchurch City Council is encouraging their use.

He says the Smart ForTwo appeals to people who like slightly quirky cars.

Nichols says his wife drives a Mitsubishi i-MiEV electric and the Smart's range is better.

It is among about 20 EVs Nichols is bringing into his yard - most of them are Nissan Leafs, and there's a couple of I-MiEvs.

Metro was started by Nichols' dad Colin in 1972. He's now retired although he still helps with the driving and other work.

Sons Chris and Phillip have run the yard at its Blenheim Rd location since 2000.

After leaving university at 19, Chris went to live in Japan in 1992. He stayed for three years, buying cars for the yard back home. Now he returns to Japan on many monthly buying trips.

Visit **www.metrochch.co.nz** or contact Chris Nichols on 021 065 5661, 03 348 5855, email **chirsn@metrochch.co.nz** for more information. ■


The Smart Fortwo at Christchurch Airport.

Company charging ahead to EV future

Hopmans QEII Cars has turned over a few Leafs - in fact, the huge majority of Christchurch's Nissan Leafs.

And it knows them inside out.

EV specialist and sales manager at Hopmans QEII Quality Cars **Jeremy Waldron** says more than 60 Nissan EVs were sold last year, mostly Leafs and e-NV200 vans.

That's along with 20 hybrids, such as Toyota Prius and Mitsubishi Outlanders.

The company sells out of EVs fast so it had 30 more in transit during February when the stink bug issue affected some vehicle shipping. Some had been pre-sold.

Hopmans QEII Quality Cars is only the second dealership in New Zealand to bring in the latest Leaf and its offer attracted 5700 hits on Trade Me Motors.

"We have two more 40kW Leafs coming, one in pearl white and the other in black. Both are high specification 'G' models," Waldron says.

The family owned business is now expanding its North New Brighton yard just to cater for EVs, particularly to meet demand.

Jeremy Waldron

The company takes a hands-on approach to everything it does, Waldron says.

"We have two four-hour EV fast chargers on site."

Director **Andre Hopman** even hand-picks cars in Ja-

Continued on page 25

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	$5.70 $5.59 $5.54
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	$5.89 $4.89 $3.41
Ecotricity	**Low Solar:** Low Usage plan for EVs & can buy back solar energy, no fixed term	Auckland Wellington Christchurch	$6.62 $4.91 $5.71
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 $6.48 $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 # $3.53 # $3.99 #
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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NEW EV CAR TYPES

MAKE	MODEL	TYPE	PRICING RRP est.	APPROX RANGE KMS
Tesla	Model S	BEV	$121,395	350 - 540 km
	Model X	BEV	$129,145	380 - 475 km
Renault	Zoe 40 kWh	BEV	$68,990	300 km
	Kangoo van	BEV	$74,990	160 km
Hyundai	Ioniq	BEV	$59,990	220 km
	Ioniq Elite	BEV	$65,990	220 km
Volkswagen	e-Golf	BEV	$61,990	220 km
BMW	i3 - Full Electric	BEV	$76,900	200 km
	i3s	BEV	$84,300	200 km
	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
Mini	Countryman	PHEV	$59,900	30km + 500 km
Mitsubishi	Outlander	PHEV	$60,990	50 km + 500 km
Audi	A3 Sportback e-tron	PHEV	$69,900	45 km + 600 km
	Q7 e-tron	PHEV	$158,400	54 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
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
Volvo	XC90 T8	PHEV	$134,900	44 km + 600 km
	XC60	PHEV	$94,900	45 km + 600 km

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

Find your

USED EV CAR TYPES

MAKE	MODEL	TYPE	PRICING RRP EST.	APPROX RANGE KMS
Nissan	LEAF Generation 1	BEV	$9k - $17k	120 km
	LEAF Gen 2 - 24 kWh battery	BEV	$14k - $27k	135 km
	LEAF Gen 2 - 30 kWh battery	BEV	$25.5K - $43k	180 km
	LEAF ZE1 - 40 kWh battery	BEV	$55k - $66k	250 km
	e-NV200 van	BEV	$20k - $26k	140 km
BMW	i3 Full Electric	BEV	$38k - $70k	200 km
Mitsubishi	i-Miev	BEV	$10k - $13.4k	100 km
	B-Miev Van	BEV	$12k	100 km
Renault	Zoe 22 kWh	BEV	$30k	220 km
	Zoe 40 kWh	BEV	$43k - $48k	300 km
Hyundai	Ioniq	BEV	$50k - $57k	220 km
	Ioniq Elite	BEV	$58k	220 km
Kia	Soul EV	BEV	$35k - $38k	150 km
Volkswagon	e-Golf - 24kWh battery	BEV	$40k	130 km
	e-Golf - 36kWh battery	BEV	$61k - $63k	200 km
Tesla	S 75	BEV	$118k	350 km
	S P85	BEV	$100k	350 km
	S 90D	BEV	$169k	420 km
	X 75D	BEV	$129k	340 km
	X 90D	BEV	$170k	410 km
Smart	Fortwo	BEV	$20k	100 km
Mercedes Benz	B250 e	BEV	$47k - $48k	140 km
	C350 e Sedan	PHEV	$66k - $74k	31 km + 700 km
	GLE500	PHEV	$150k	30 km + 700 km
	E350 e	PHEV	$120k	30 km + 600 km
	S500 e	PHEV	$135k	30 km + 700 km
Toyota	Plug-in Prius	PHEV	$19k - $39k	26 km + 800 km
Audi	A3 Sportback E-Tron	PHEV	$55k - $65k	45 km + 600 km
	Q7 e-tron	PHEV	$140k	54 km + 800 km
Mini	Countryman Cooper SE	PHEV	$63k	30km + 500 km
BMW	i3 REX	PHEV	$40k - $65k	200 km + 150 km
	225xe	PHEV	$55k	41 km + 550 km
	330e	PHEV	$50k - $77k	37 km + 550 km
	X5 xDrive40e	PHEV	$140k	30 km + 800 km
	i8	PHEV	$128k	37 km + 400 km
Mitsubishi	Outlander	PHEV	$27k - $68k	50 km + 500 km
Volvo	XC90 T8	PHEV	$130k	44 km + 600 km
Porsche	Cayenne S e-hybrid	PHEV	$135k	20 km + 750 km

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

USED DEALERS LIST

NAME	CITY
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Harwood Cars | 027 492 2218 www.harwoodcars.com	**Auckland**
Volt Vehicles 0800 748 658 / 022 4800 722 david@voltvehicles.co.nz	**Auckland**
PlugN Drive NZ	Auckland
Farmer Auto Village	Tauranga
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Setting the pace for e-bikes

The Pacer GT certainly lives up to its name. The electric bicycle from Smartmotion goes quicker than a scalded cat and makes a mockery of mountains – well, steep hills anyway.

The 250W/300W Bafang mid-drive electric motor powers a belt drive system that eliminates issues around chain drive systems and provides a smooth ride.

There's much about this bike to like – including the speed. You can rachet up the pedal assist to provide the power you want. But even short of full assist, the Pacer GT gets along flat sections of road and pathways at well over 30kmh.

It will do 40kmh without the rider straining on pedal assist and even clocks up 50kmh to 60kmh downhill.

Designed as a commuter bike, tourer or daily get around, the Pacer GT can easily keep up with traffic and proves a blast on the cycleways.

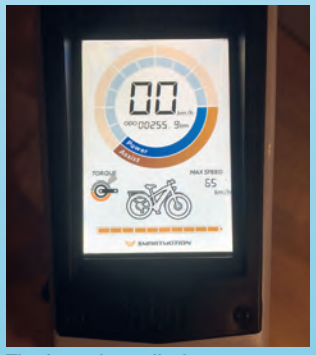
Even with a belting headwind the Pacer keeps its pace – providing a Godsend for road cyclists wanting to draft.

"I just love e-bikes," one said while tucking in behind on a long stretch into the wind.

You can easily see the speed, how much power assist is dialled up, remaining battery power and even torque and cadence on a colour LCD display incorporated into the frame just behind the handlebars.

A torque sensor measures your pedal pressure and multiplies your input for a super smooth ride.

Editor Geoff Dobson tests the Smartmotion Pacer GT.



The frame inset display screen.

The inset screen avoids handlebar clutter and means it's pretty much crash-proof too. The frame display includes a USB port and another charging point.

A 36-volt frame-mounted Panasonic battery provides 504Wh and its range from one full charge is easily around 50km. Taking it on a 35km-plus journey over hills, dips, flat stretches and some rough sealed roads around the Kumeu district in Auckland still left three battery bars lit out of 10 at the finish.

The throttle-like gear changer (middle) with the display showing selection for an incline.

And that was with just below full pedal assist, a headwind in many places and pushing it hard.

A similar situation applies on the 23km one-way commute to work with a heavy backpack, featuring several steep sections. The battery bars barely dip to under seven.

The alloy head shock front fork and reasonably big tyres mean a comfortable ride even on rough stretches where a road cycle with high pressure tyres would shudder and shake.

You can have the bike light up like a Christmas tree with LED strip lighting down the front frame and on the carrier's two rear bars.

They're coupled with powerful front and rear lights. The front light alone is 900 lumen with an 80-metre throw and a wide beam. Dubbed "Lightsaver", the system ensures you will be seen while also lighting your path.

Gear changes are very different from a normal chain-driven bike.

There's no throttle but the gear-changing system is very throttle-like.

A small handlebar display shows a stick-figure rider and bike on a line which goes from flat to a steep up and down hill as you wind the handlebar control toward or away from you.

Once you get used to it, the gearing is easily adjustable and kicks in quickly.

Other features include full-sized alloy guards, a high capacity rear carrier (useful for a good-sized bag, panniers or a child seat), kick stand and a drink holder behind the seat.

It's 24kg weight is similar to many other e-bikes and can be easily manoeuvred into lifts.

Continued on page 15

MICRO EVS

The rules are simple, really

Electrify NZ managing director Michael Tritt has some thoughts on e-bike etiquette. Tips about how to get around safely on an e-bike featured in the EVtalk January issue.

The rules of e-bike etiquette are the same as those that apply to standard bikes or to life in general - be considerate of others.

An e-bike will let you achieve higher speeds and power up hills in a way you can't on a regular bike.

These factors have led to the rapid uptake in e-bikes for commuting and recreation but, to borrow a quote from Spiderman, "with great power comes great responsibility".

Electric bikes share space with others - motor vehicles, pedestrians and other cyclists - and maintaining constant awareness of them is essential.

Pedestrians are the most vulnerable group so on shared paths, ride slowly when going past people on foot and use your bell to warn them when approaching from behind.

Technically, you're not allowed to ride on the footpath but some cyclists do it to avoid dangerous spots on the road - if you do, ride slowly and watch carefully for pedestrians and vehicles using driveways.

Stop and give way at pedestrian crossings, don't just tear through at high speed. Signal when you're making a turn. Use bright lights at night (or anytime) to make yourself visible.

Michael Tritt

You'll often pass regular cyclists, especially up hills, but do so carefully and use your bell to warn them if you're passing on a narrow stretch.

Some motorists are not considerate of cyclists but that's no reason not to be considerate of drivers. Obey the rules.

You'll find the faster acceleration on an e-bike lets you keep pace with traffic more easily, making take-off at lights and lane-switching generally safer - but be aware that drivers might not always be expecting your burst of acceleration.

Keep left and don't hog the road but ensure you allow a safe margin for yourself, especially when passing parked cars (the dreaded door opening).

In other words, be as considerate as you can be without putting yourself in danger. □

Setting the pace for e-bikes

Continued from page 14

The Pacer GT costs $4799 (RRP) compared with the standard Pacer at $3599 and comes with a six-year warranty on the frame and two years on the motor.

Mercury customers can get $250 off the price of this and any other Smartmotion or selected e-bikes.

**Thanks to Chris Speedy of Electric Bikes NZ for the use of the New Zealand designed Pacer GT.*

Electric Bikes NZ at 28 Arrenway Drive in Albany, Auckland, also stocks other Smartmotion e-bikes like the popular e-city step-through.

Speedy supplies e-bikes to 55 dealers from Kerikeri to Invercargill.

Visit **www.electricbikes.co.nz** for more information. □

Charging stations and e-bikes for hotel guests

Perhaps an "E" for electrical should be added to CQ Hotels in Wellington as it caters for guests with electric vehicles and even provides e-bikes for hire.

CQ Hotels, which stands for Comfort Hotel Wellington and Quality Hotel Wellington, was the first in the city to introduce an EV charging station for guests.

It has eight chargers available in its secure carpark as well as a dedicated Tesla charging port.

Payment for charger use ($30 per night) automatically goes on the guest's account.

Introducing the charging stations supported the Wellington City Council's electrical vehicle programme. The initiative to adopt green transport technology is also a part of CQ Hotels' focus on sustainability.

CQ Hotels in Wellington.

No more charging stations are in the pipeline yet because use of the present ones is minimal at the moment, CQ Hotels general manager **Nigel Harper** says.

But their use is expected to increase as more guests switch to EVs.

CQ Hotel is also the first Wellington hotel to offer its guests electric bikes.

Two e-bikes are available for hire and are proving popular.

"They give our guests a chance to see the capital in a fun, affordable and unique way," the hotel website says.

"It is a completely different experience to sitting in the back of a tour bus."

The e-bikes are equipped with pedal assist, providing up to 150% of the rider's own pedal power. That makes Wellington's many hills much easier, enabling riders to enjoy city sights without discomfort.

They're handy too for travelling the one kilometre to the Museum of New Zealand Te Papa Tongarewa and the three kilometres to Wellington Zoo, for instance.

Half-day hire for guests costs $35 and a full day is $60. Regular bike hire is also available, complimentary to guests, with two provided along with locks, helmets and baskets if needed.

Bikes and organised tours are available through reception. CQ Hotels are located at 213-223 Cuba Street.

Contact **info@cqwellington.com**, phone 0800 888 5999 or visit **www.cqwellington.com/** for more information. ■

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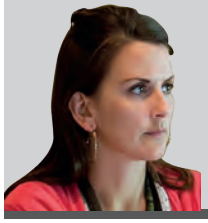
Electrifying the future? It's academic



Dr Debbie Hopkins is a departmental research lecturer at Oxford University's Transport Studies Unit and School of Geography and the Environment. She is passionate about low-carbon mobility and reducing transport-related emissions for a sustainable and socially just future. She will be speaking at the T-Tech Conference in Auckland on March 19-20.
Debbie.hopkins@ouce.ox.ac.uk

It is widely argued that shifting away from internal combustion engine vehicles to plug-in EVs using New Zealand's high proportion renewable electricity will help address climate change and contribute to a low carbon mobility transition.

Increasingly, electric propulsion is coupled with automated (driverless, self-driving, autonomous) vehicle technologies and sharing practices (mobility-as-a-service, car clubs and on-demand mobility) to present a future mobility system that is more environmentally sustainable, equitable and healthy.

There is considerable hype around electrification, automation and sharing. These terms have become the buzzwords of future passenger mobility in New Zealand and around the world.

Expectations of electrification, automation and sharing to contribute to a low-carbon mobility transition are at an all-time high.

In the United Kingdom, this has led to large-scale government investment in the research and development of associated technologies and – particularly with automation – public demonstrations.

Will electrification be the solution?

Mass-adoption of EVs is often framed as the solution to transport-related carbon emissions.

However, much attention needs to be paid to the dynamics by which they are adopted, the implications for the broader energy system, how EVs might fit with or challenge existing social practices, and lifecycle emissions.

For instance, charging has become a key issue for consumers and producers. With rapid improvements in battery technologies, range anxiety should become a thing of the past.

However, range anxiety is not a technical concept – it is a highly social construct that cannot be overcome by technological capabilities alone.

Networks of both public and private charging infrastructures will be an important part of this picture but so too will be how charging electric vehicles is domesticated, that is to say, how people adopt particular charging habits.

Will drivers "gorge" (charge a whole battery in one go) or "graze" (small top-ups on the go)?

Life-cycle emissions have become another pressing topic, particularly challenging assumptions that EVs will always have a lower carbon footprint than their ICE counterparts.

Work conducted for the European Parliament has shown that EVs do not produce climate benefits in all circumstances and that techniques for vehicle production and vehicle size are, amongst other factors, critical for determining lifetime emissions.

What about automation?

Automation reframes the issues of charging practices, other social practices (working practices, for example) and user behaviours, rhythms and routines (e.g. trip chaining).

Many of the claims made about automated vehicles rely on full automation – what has also been described as SAE Level 5 automation – which, by most estimates, will be 10-20 years in the future - and this does not account for fleet turnover and other system dynamics.

With these timeframes, automation is unlikely to contribute to 2030 emission reduction targets.

A privately owned, fully automated EV could offer efficiency potentials through the reduced role of human drivers and opportunities to programme fuel-efficient driving behaviour – such as smoother driving.

Knowledge of routes, parking availability and such like could also reduce kilometres driven unnecessarily.

However, claims of reducing congestion and the need for urban parking spaces overlook important transport rebound dynamics and increased redundant mileage as vehicles return "home".

Only under a shared mobility future do automated vehicles begin to offer carbon and other emission reduction benefits.

Can we share?

Shared mobility is arguably the most complex part of this picture of future mobility.

Drivers in New Zealand and in other countries where the private vehicle is dominant – what is referred to as "the system of automobility" – have deeply held attachments to their vehicle.

Vehicles are named, they are "more than transport" (storage, a social space, etc). They offer particular experiences and represent a particular social status and lifestyle – and while millennials might be starting to challenge this trend, it is still broadly argued the entrenchment of automobility persists.

That is not to say a shared future is impossible. On the

Continued on page 19

Remember the Jetsons?

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

For some of us, it's likely that cartoon shaped our early vision of the future - robots, interactive entertainment, automation on demand, self-driving flying transport.

Today, it almost sounds like the technology section of any modern mainstream news outlet.

In fact, top New Zealand articles are about drones making factories more efficient, drones used for inspecting structures to assure safety, people being racist toward robots, our smartphone addiction and the possibility of driverless buses.

New Zealand is even leading the way in the development of personal "jetpacks".

One technology that is being aggressively developed globally is automated ground transport - autonomous cars. The challenge and promises of this technology are profound and have the capacity to fundamentally change how - and where - many of us live.

The greatest challenge in realising automated vehicles is the automated part. Developing a computational model of driving is a daunting task.

To illustrate, imagine having to write a single list of rules that covers every possible driving environment, situation and contingency. Now imagine that this list must produce results at least as good as human drivers.

The requirement will likely be much more stringent but that's the minimum outcome supporting logical arguments for adoption.

Now - and this is really the artificial intelligence (AI) challenge we are trying to overcome - imagine having to develop a system that parses (analyses) an image picked up by camera and other sensors - radar, range finder, moisture detector, etc - into objects, conditions, characteristics and behavioural expectations.

Finally, imagine trying to integrate those two systems.

Most current solutions are solved by building maps that integrate as much data as possible so the vehicle must reference only the initial rule set.

Sensors can be dedicated to resolving safety conflicts. Due to the demands of this map, solutions are limited to specified geographic areas where information is managed.

We can and we have built these systems.

We do not have "everywhere, anytime" automated vehicles because even the "smartest" system fails when put in an environment with the completely unpredictable behaviours of humans and other entities that might share the roadway – at least to the level of success specified above.

That means the solution is either better tech, which we are working on, or changing the environment.

We could build a new restricted roadway system dedicated to such a network. What if I told you the cost of this roadway could be as low as free?

That's where we return to the future envisioned in the Jetsons. In the cartoon, people zipped about in flying cars. We could define 3D corridors over our cities (at 100-200m altitude, for instance) for such vehicles - virtual motorways in the sky.

The motorways could be used by vehicles based on the drones that are becoming so pervasive.

A fleet of these vehicles, all EVs of course, would offer an alternative transport option. It's an option that would not depend on roadways and would be immune to many of the frailties of our current infrastructure.

It would also open new areas for expansion, such as islands or otherwise geographically isolated areas. In Auckland, it could mean that Manukau Heads or even Coromandel become viable commuting options.

Commutes would be limited by distance "as the

Continued on page 23

Electrifying the future? It's academic

Continued from page 18

contrary, we are starting to see the use of apps and other web-based platforms and a wide variety of business models that offer lift-sharing, vehicle-sharing and other types of mobility.

An electric, automated, shared mobility future?

Innovations in fuels, robotics and ownership models offer opportunities for different types of mobile futures.

However, technologies alone are unlikely to contribute to the radical emissions reductions desperately needed in New Zealand and internationally.

Transport has an important part to play in responding to climate change and alternative fuels need to be a part of this future.

But to harness such benefits new ways of being mobile (through sharing, for example) need to combined with active modes (walking and cycling) and only then might we start to see a sustained and meaningful low-carbon transition.

Visit **www.itsnz.org/t-tech** for more information on the T-Tech Conference.

Ohmio Automotion's Stephen Matthews, left, and Dave Verma in the Ohmio Hop.

London's Lord Mayor Charles Bowman tries the Ohmio shuttle at MOTAT in Auckland.

Ohmio's setting smart technology in motion

Kiwi autonomous electric vehicle company Ohmio Automotion expects to make its first commercial delivery in May.

The east Auckland company displayed a fully operational driverless test vehicle at the Digital Nations 2030 event in Auckland on February 19.

It took the Lord Mayor of London **Charles Bowman** for a ride at MOTAT the same day he was leading a business delegation here.

Founded in New Zealand, Ohmio has developed world-leading autonomous vehicle (AV) technology and plans to have its first self-driving vehicle in active service by May.

The first commercially ready model under construction is the Ohmio Lift. It can carry up to 20 passengers as a "last mile" transport solution.

Another is the Ohmio Hop – the smallest in a planned range of electric, self-driving passenger or freight vehicles, and the one displayed at Digital Nations 2030.

A freight-only version, the Move, is also planned among the four prototypes expected to be available.

The shuttles can have a variety of chassis for specific purposes, such as transporting up to 30 people or carrying freight, whichever body design buyers want. Parts can be swapped as well.

It is understood the freight version will probably be used in a major residential precinct to transport food, drinks and waste between buildings.

Ohmio is a new business from the HMI Global group of companies, a global intelligent transport systems (ITS) company which has expanded from Auckland into Australia, Asia and Europe.

It has developed scalable, connected AV technology so its vehicles are designed to connect with other vehicles, traffic management networks and positioning systems.

They can easily be deployed, alone or connected, forming efficient convoys that require less road space and can safely navigate their environment with sensors and artificial intelligence.

The connectivity of the Ohmio vehicles sets them apart from existing last mile AV vehicles.

HMI is raising $6 million to help fund the Ohmio projects and has spent nearly that already. The money will help expand Ohmio's engineering team from the current 20, assist with research and development and be put towards worldwide marketing.

A new Ohmio sells for about $400,000 and Ohmio Automotion chief executive **Stephen Matthews** hopes around 60-100 will be sold in the first year.

He reckons Ohmio Automotion could sell up to 2000 of its shuttles annually within about five years as world demand expands, particularly in the United States and Asia.

Christchurch airport could trial the shuttles later this year.

Meanwhile, Ohmio representatives are in demand for various events similar to the Digital Nations 2030 summit.

Ohmio Automotion's research and development coordinator **Mahmood Hikmet** is among about 20 speakers at AI Day on March 28. It's described as "New Zealand's premier artificial intelligence event".

One of the Ohmio shuttles will be on display near the event at the ASB Waterfront Theatre in Auckland, presented by AI Forum NZ and NewZealand.ai.

Hikmet, who has just gained a PhD in electronic and electrical engineering from the University of Auckland, is a son of **Mohammed Hikme**t who founded HMI Technologies (Ohmio's parent company) with his brother **Ahmed** in 1999.

AI Day will explore opportunities, impacts on business, customers and workforce, developing an AI capability, benefits to people and society, and the future of AI.

An Ohmio shuttle is also expected to be on show during the Leading the Charge EV tour of New Zealand from March 14 to April 3.

Visit **www.ohmio.com** for more information.

No driver's licence required

Prepare for a future where you no longer need to drive – or even have a driver's licence.

Autonomous or automated vehicles (AVs) are poised to revolutionise not only transportation but the way people live and work.

That's according to the KPMG 2018 Autonomous Vehicles Readiness Index (AVRI).

It ranks New Zealand ninth out of 20 countries in a report on the state of AV preparation.

The AVRI evaluates the preparedness of 20 countries and highlights best practice to help countries accelerate AV adoption. Evaluations are based on policy and legislation, technology and innovation, infrastructure and consumer acceptance.

New Zealand is second only to Singapore on policy and legislation, with high scores for AV regulation. There is no specific legal requirements for cars to contain drivers here and our Government is generally supportive of the technology, the report notes.

We also have a strong reputation as a technology test-bed and consumers that are relatively accepting of new technologies.

"Low-cost mobility provided by AVs will bring benefits in productivity, income and quality of life," KPMG Deal Advisory director **Istvan Csorogi** says.

"But it will also bring major challenges, for example in ensuring that AVs are safe and our roads and cities are built with AVs in mind."

The report introduction notes the pace of AV development is "breath-taking".

"A year ago, some would have argued that they would never become a reality. But now, AVs are being piloted in a number of countries and are running on public roads.

"The question is no longer whether but when all road vehicles become fully autonomous."

Among developments are Ford delivering pizzas in Miami to test its driverless vehicles, possibly leading to ride-sharing, and Waymo gaining approval for the United States' first commercial driverless ride-hailing service, aiming to start this year in Arizona with Chrysler Pacifica minivans ferrying paying passengers using a smartphone app or website.

A robot driver "IVO" is being developed in Israel to use existing cars, trucks and other industrial vehicles so there's no need to use specially built autonomous vehicles.

New technology continues to improve the outlook for AVs, likely to be very popular with ride-share services.

A new laser-based system could allow vehicles to "see" obstacles before they come into view, for instance.

Australia has been lagging in electric vehicle and AV development, placing 14th on the KPMG AVRI. But some states, like Victoria, are pushing ahead with AV projects.

VicRoads can grant permits to individuals or organisations wanting to hold AV road trials, under Road Safety Act changes. A $9 million grant programme for researchers and industry is available too.

Under the new laws, all driverless vehicle trials will require a human supervisor to monitor the vehicle from either inside or outside the vehicle. Once it has been established a vehicle can drive safely, that condition may be removed.

Stakes are high in the AV race. For example, Delphi plans to buy self-driving car company Nutonomy for US$450 million. Delphi sees the first opportunity in commercial vehicles, then expanding to consumer vehicles.

It will have autonomous driving operations in Boston, Pittsburgh, Singapore, Santa Monica, and Silicon Valley, with the company aiming to have 60 autonomous cars on the road by the end of the year.

That we can expect big changes seems certain. Tesla and The Boring Company founder **Elon Musk** wants to put high-speed autonomous electric buses in urban tunnels, for example.

Musk says the company's urban loop system would have thousands of small stations the size of a single parking space that take passengers very close to their destination and blend seamlessly into the city's fabric.

After setting up mass transit solutions, Musk plans to have cars also descend from street level aboard electric "skates" on lifts to whiz around the underground network.

He's already digging tunnels in Los Angeles and plans to do the same on the United States East Coast.

Toyota Motor Corporation's new design general manager **Simon Humphries** believes even the mass-market for vehicles could disappear.

Humphries says he sees a future market divided into the widespread adoption of generic, autonomous mobility devices and luxury vehicles and sports cars.

Visit **www.kpmg.com/avri** for the full 60-page AVRI report.

Driverless pizza delivery from Ford.

Promising but needs a bit of polish

Volvo has huge aspirations for its electric vehicles.

By early next decade, every model will be electrified and Volvo has already indicated its performance arm - Polestar - will also concentrate on electric propulsion.

So far, its local plug-in efforts extend to two vehicles, a plug-in hybrid version of the XC90 SUV, and now its midsize SUV offering, the XC60, a development of the same drivetrain but smaller.

There is a crucial difference, with the battery growing to 10.4kWh, but otherwise the drivetrain is mostly the same.

The bigger battery means a slightly longer charging time of two and a half hours at its fastest, and an electric-only range of up to 40km. Rated fuel consumption is the same, at 2.1 litres per 100km.

Called "Twin Power" in Volvo speak, the drivetrain features a 235kW 2-litre turbocharged and supercharged engine driving the front wheels and an electric motor driving the wheels.

The front engine outputs 235kW through an eight-speed automatic transmission and the electric motor adds an extra 64kW. Volvo claims that gives it an overall rating of 300kW - and we would believe it. The XC60 is a ferret off the line - it feels very quick away from the lights.

There's a range of drive modes to select from.

The default is a hybrid system and there are Eco, Performance, and EV-only options. The car won't default to EV at startup; it will always kick off in hybrid, requiring driver intervention to stick just to the battery.

Even when in EV mode, the engine can still kick off if it's asked for more power than the rear motor can offer. Thankfully, Volvo replaces the tachometer in the digital dash when in the hybrid or EV modes with a clever active gauge that shows how far it can be pushed on the greener power source.

We baulked at Volvo's claim of 2.1 litres per 100km initially but it's achievable over for moderate distances provided it's charged frequently. Some city running around and a run from Greenlane to Albany and we saw only 0.9 litres per 100km on the Volvo's dash.

Longer trips varied between 7-9 litres per 100km, not bad for a substantial, high-performance vehicle.

On the flipside, getting and keeping fuel on board the Volvo is a little bit of a challenge. There's a type-one charging port forward of the passenger door - type two is on the way.

The onboard charger is rated at 3.5kW, which means the Volvo can't take advantage of any of the higher-powered AC charging options becoming available. Even a 7kW charger would have allowed a full charge in the length of a long lunch at Sylvia Park. It would increase the car's electric-only usability immensely.

Another area that also needs review is the brakes. Like most plug-in brakes, regeneration makes them feel a little firm and aggressive but in the T8 that goes to the level of unrefined. We would struggle to make smooth stops in traffic at times. Our hope is that some wear, and perhaps a software update from the factory, will ultimately fix this.

Like the rest of the XC60 range, the T8 is a great car to drive, with firm and stable handling. The steering is not as responsive as competitors like the BMW X3 but it can still be hustled along a twisty road at pace.

The interior feels well laid out and premium. The seats are electrically adjustable and incredibly supportive and comfortable - Scandinavians know a thing or two about furniture.

Fit and finish feels excellent, and comfort in the front of the car is great - these are some of the best seats fitted to any car in the market. Rear legroom is a little tight but a six-foot passenger can still sit behind a six-foot driver.

Volvo has replaced most interior buttons with an iPad-like 9-inch tablet, which can be connected to the internet to power a range of apps. Apple CarPlay and Android Auto are standard.

Also standard is lane keeping aid, oncoming lane mitigation and steer assist. These join the standard "Intellisafe City Safety" system, which includes pedestrian, cyclist, vehicle and large animal detection with automatic emergency braking.

Volvo's Pilot system is up there with the best semi-autonomous vehicle systems on the market, and one of the easier to activate - hit the cruise control button then toggle across to your preferred level of assistance.

Options including nappa leather seats with ventilation and massage, Bowers & Wilkins Premium Sound and four-corner air suspension provide XC60 customers with the opportunity to add even more personalisation.

Optional air suspension is priced at $4200 though be aware this system lowers the car when you switch it off and if you sit with your foot on the brakes, they can creak, a little alarmingly at first.

The small niggles with the car are outweighed by how good it is overall - and we think they are items likely to be polished with software updates over the lifecycle of the vehicle.

The T8 R-Design is priced at $117,900.

Remember the Jetsons?

Continued from page 19

drone flies" as opposed to geographic features. In fact, the idea even opens the possibility of settlements where roads cannot be reasonably built or maintained.

Admittedly, there are challenges that must be overcome.

Drones for use in passenger transport are very much in their early design stages, engineering issues have to be overcome, safety options need to be explored, noise and other environmental effects need to be addressed and governments, enabling policy legislation/regulation, need to be prepared.

Well, that sounds more like an opportunity than a challenge.

It also provides an opportunity to rethink the design of our cities.

There are real risks involved as well. Control should be entirely out of the hands of humans except in extreme circumstances and the vehicles need to be maintained at the level of aircraft.

Degradation needs to be identified and impaired vehicles removed from the system until addressed.

Finally, and perhaps most importantly, we do not simply want to move the problems of road transport into the air. With enough vehicles, even 3D roadways could get congested.

The solution is simple – limit the system to public transport, a variety of drone "buses" of different sizes and some special purpose vehicles that serve the public good, such as ambulances and police.

The system would not be designed to replace current transport options, only augment them. Even if 10% of road users chose to use this option, it would make the road much more convenient for those who decide to ride in cars as well as those who were riding in feeder buses or other last mile options, making all public transport more efficient.

It is possible we will see automated drones as a transport option before we have level 5 autonomy on our roadways.

Maybe the next thing will be the Jetsons' flying homes, a solution to our housing crisis? ■

EV DIRECTORY

The comprehensive guide to every service an EV owner or dealer could use

EV CHARGING

CHARGENET NZ
0800 2 CHARGE
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www.charge.net.nz
New Zealand's only nationwide network of Rapid DC Chargers for electric vehicles.

ChargeMASTER LTD
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nigel@chargemaster.co.nz
www.chargemaster.co.nz
Our mission is intelligent charging - for residential, commercial/fleet, public& high capacity bus/port/mining charging.

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ev@yhi.co.nz
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www.yhipower.co.nz
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EV Charging cables that are made, tested & compliant for the NZ market.

EV MEMBERSHIP ORG

DRIVE ELECTRIC
drive@driveelectric.org.nz
www.driveelectric.org.nz
Drive Electric is a not-for-profit membership organisation with one goal – making EV ownership in NZ mainstream.

FINANCE & INSURANCE

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Quick and easy car loan applications. Fast approvals. Rates from 9.55% p.a. UDC lending criteria, terms and conditions apply.
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Chief Executive Officer
Helping dealers "Make Profits Grow". Specialist F&I training, support and products to retail motor vehicle traders.

VEHICLE INSPECTION

VINZ
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www.vinz.co.nz
NZ's independent vehicle inspection specialists – ask about our hybrid & electric vehicle safety check.

VEHICLE SERVICING

GILTRAP NISSAN
09 522 9928
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www.giltrapnissan.co.nz
Nissan NZ Authorised EV Service Centre conveniently located in Newmarket, Auckland. Open 6 days.

EVs closer to 8000 goal

New Zealand's electric vehicle fleet size is closing in quickly on this year's 8000 target, reaching 6884 in February.

All light EV registrations for the month were 281, compared with 230 for February last year, latest Ministry of Transport figures show. In February 2016 that total was just 62.

Used light pure EVs continue to lead the field, with 3664 recorded by February 2018 – up 172 on the previous month.

New light pure electrics reached 1358 in February, up 30 on January.

Close behind are new light plug-in hybrids on 1292 – 63 more than in January - and used light plug-in hybrids are further back on 491 – 13 more than last month.

Heavy EVs have barely moved – at 79, they were up two on January.

New Zealand has a goal of reaching 64,000 EVs on the road by the end of 2021, aiming to double the number each year until then.

The target is 8000 by the end of this year and 16,000 by the end of 2019 to achieve the goal which is likely to be met much earlier at this rate. ■

USED IMPORTS FEB 2018		
MAKE	MODEL	TOTAL
BEV - BATTERY ELECTRIC VEHICLE		
NISSAN	LEAF	145
NISSAN	E-NV200	6
RENAULT	ZOE	3
KIA	SOUL	2
MITSUBISHI	I-MIEV	2
BMW	I3	1
HYUNDAI	IONIQ	1
MERCEDES-BENZ	B250	1
SMART	FORTWO	1
PLUG IN HYBRID		
TOYOTA	PRIUS	7
BMW	I3	3
MITSUBISHI	OUTLANDER	3

NEW MAKES AND MODELS FEB 2018	
Make and Model	Total
ELECTRIC	
HYUNDAI IONIQ	8
BMW I	6
TESLA MODEL S	6
VOLKSWAGEN GOLF	5
TESLA MODEL X	4
RENAULT ZOE	1
RENAULT KANGOO	1
PLUG-IN HYBRID	
MITSUBISHI OUTLANDER	16
BMW I	10
KIA NIRO	10
AUDI A3	7
VOLVO XC60	6
HYUNDAI IONIQ	4
MINI COUNTRYMAN	3
VOLVO XC90	3
AUDI Q7	2
BMW 5 SERIES	1
PORSCHE PANAMERA	1

Two electric road trips combine

Two French students travelling around New Zealand in a new Jucy electric campervan plan to join the Leading the Charge EV road trip in Greymouth on March 18.

Heloise de Bokay and Solene Trinquet have already spent more than 60 days on the road since starting out on January 15.

They've covered more than 40,000km and charged up about 60 times, at one time arriving at a charging station with only 1% of batter power left.

Braving a few storms in their campervan rooftop tent, the two says they're thoroughly enjoying the journey and are being greeted by many friendly drivers and others.

Trinquet was unable to share the driving earlier on because her driver's licence was stolen with her bag a week before leaving France. However, she now has a replacement.

They continue to post details of their trip on social media. ■

Heloise de Bokay and Solene Trinquet are enjoying travelling around New Zealand in their Jucy prototype electric campervan, a Nissan eNV200.

Leading the Charge EV road trip itinerary

South Island. March 15 - Outside Eichart's Hotel, Queenstown, 10am-11.30am, 302 Hawthorne Dr, Frankton, Noon–2pm, 9 Thompson St, Bridge Hill, Alexandra, 4.30pm-5.30pm; March 16 - The Octagon, Dunedin 8am-1pm, 1 Hobbs Street, Timaru, 4pm-6pm; March 17 - West St Carpark (Ashburton Market), Ashburton, 9am-10am, 19 Memorial Ave (Fendalton New World Carpark), Christchurch noon-2pm; March 18 - 83 High St (Westland Recreation Centre), Greymouth, 12.30pm-3.30pm; March 20 - Richmond charger, 280 Queen St (behind Richmond Library), noon-2pm; March 21 – Liz Davidson Pl, Cnr Queen & Charles St, Blenheim, 10am-noon.

North Island. March 22 - Dowse Museum, Lower Hutt, 11am-3pm; March 23 - Cuba St (bottom end), Wellington, 11am-7pm; March 24 – Pak'nSave carpark, Glasgow St, Whanganui, noon-2.30pm, film - Revenge of the Electric Car, 7pm-9pm; March 25 - The Square, Palmerston North, noon-4pm; March 26 - 20 Te Aute Rd, Havelock North, 11.30am-1pm, Te Mata Peak, 2pm-2.45pm, Sound Shell, 70 Marine Parade, Napier, 4pm-6pm; March 27 - 5464 SH2, Putorino charger opening 9am-9.30am, Electric Village, 37 Gladstone Road, Gisborne, 12.30pm-2.30pm; March 28 - Bayfair Shopping Centre, 19 Girven Rd, Mt Maunganui, 11am-1pm, Garden Square, Hamilton, 3pm-6pm; March 31 - AUT Akoranga Campus Carpark 2, Auckland, noon-4pm; April 3 - Canopy Bridge, Whangarei, noon-2pm, 1 Butler Rd, Kerikeri, 4pm-5pm; April 4 - Cape Reinga signpost, 5.45pm-6.30pm. ■

Company charging ahead to EV future

Continued from page 10

pan, ensuring an EV's battery state of health is as good as possible, usually around 90% or above (12 bars).

"Our demonstrator Leaf is very popular, especially with over-night test runs," he says.

Hopman believes EV and hybrid cars are the future.

"We are very excited for what the future holds in EV type vehicles."

Hopmans QEII was formed in 2001 and has taken off, selling an average of 1000 cars and vans a year.

It's so successful that Hopman's sons **George** and **James** are now also involved in the business - George as business manager for the finance and insurance side and James in sales.

"We have a dedicated finance office and George can tailor loans to your affordability with interest rates that beat the bank," Hopman says.

George Hopman, left, Andre Hopman, Jeremy Waldron and James Hopman.

"He also offers outbound finance for boats, caravans, machinery, and vehicles either privately or from another dealer."

Hopman not only stands behind every car sold but he also runs a "Find-a-car" service so he can import or source a car for a customer.

Waldron says the dealership is among the largest in the South Island for Nissan EVs.

The Hopmans QEII dealership in Christchurch.

"Between $20,000 to $30,000 gets you a near-new low mileage EV," he says.

EVs also come with a one-year warranty, New Zealand-certified charging cord, English dash conversion and all on-road costs.

Waldron says EV interest is definitely growing fast – and with the Nissan Leaf being voted the most reliable car in New Zealand (source Consumer NZ), sales have taken off.

With no oil or servicing requirements and charging at home overnight costing $2.50, ownership is a "no brainer," he says.

Specialising mainly in late model Japanese imports, the dealership has a selection of New Zealand new models also. Although many go to Canterbury people, the company also regularly ships vehicles nationwide.

It supplied a large quantity of commercial vehicles to all trades for the Canterbury rebuild after the earthquakes.

The most popular seller has been the Toyota Hiace, of which the company stocks a large range.

The company motto is "Best Price, Quality and Service Guaranteed". All vehicles are serviced by its Auto Super Shoppe and MTA certified workshop, meaning they have a six- month MTA warranty.

Hopman has also been a director on the MTA board and is currently involved with the MTA used vehicle dealer committee and Canterbury MTA coast-to-coast hub executive.

Visit **www.hopmans.co.nz** for more information. ■

Bright future for Kia's electrified SUV

Continued from page 4

Meanwhile, the plug-in hybrid version of the Niro is evidently capable of achieving 1.3 litres per 100km fuel economy, thanks to its larger 96-cell, 117kg, 8.8kWh battery.

It also gains the increased equipment levels of the upmarket version of the Niro HEV Limited parallel hybrid ($43,990), with leather upholstery and the addition of extra crash-savers such as blind-spot monitors, lane keeping assistance, rear cross traffic alert and front parking sensors.

Open the alloy tailgate of the $55,990 Niro PHEV Limited and you'll find two charging cables. One is for 8-amp domestic house plugs and it can recharge the battery in four hours; the other is for three-phase charging stations and can reduce the time taken to full power storage to 2.5 hours.

By the time I got to drive a Niro PHEV at the launch, the previous pilot had drained all the power from the battery.

If you're serious about driving electrically, perhaps it's better to wait for Kia's fully electric version of the Niro. ■

EV TALK DIARY

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

February 1

Port starts micro-grid research

Solar power will play an important part in Ports of Auckland's aim to become a leading sustainable port globally and emissions-free by 2040.

The port has launched a pilot programme to establish a DC micro-grid for buildings at the company's sea port and inland freight hubs.

February 2

Renault Trucks go electric

Production will start on a range of electric vehicles next year, Renault Trucks says.

The move will capitalise on the experience gleaned from 10 years of testing electric trucks in real-life conditions with customer-partners, the company says.

ChargeNet switching connectors

ChargeNet NZ has told its customers all of its remaining chargers will switch over to CSS Type 2 connectors within a week or two.

The switchover will mark the completion of its standardisation process intended to provide customers with a more consistent offering, the company says.

February 5

Leading the Charge starts March 14

Preparations are nearly complete for the Leading the Charge EV road trip over 5000km from Bluff to Cape Reinga from March 14 to April 3.

EV owners are being invited to join in on any leg or attend some of the 26 events planned along the way.

Californian EVangelist and regular visitor **Chelsea Sexton** is going along for the entire ride and two French students on an EV tour of New Zealand will join in for about four days.

February 7

Wiring changes include EVs

Guidelines around electric vehicles are included for the first time in about 194 changes to the Wiring Rules (AS/NZS 3000) to be released in March and likely to be adopted early next year.

"Electric vehicles can't just be plugged into an ordinary socket, for example, they need to be wired with a specific residual current device (RCD) to cope with the electronics involved," Master Electricians chief executive officer Bernie McLaughlin told *Newshub*.

Roadshows run by the professional trade organisation to inform electrical workers around the country about the changes start in Dunedin on March 5 and finish in Auckland on April 12.

February 8

'Huge' response to new Leaf

The new Nissan Leaf should be available new in New Zealand towards the end of the April 1, 2018, to March 31, 2019 financial year.

That's the belief of Nissan New Zealand managing director John Manley who drove it at the Nissan Futures event in Singapore where the Leaf's sale in seven markets in Asia and Oceania was announced.

"We've had a huge response to date," Manley says. "The car's taken off like a rocket overseas."

February 9

EVs continue to rise

Electric vehicle numbers reached 6603 in January, up nearly 400 on December.

That's pushing even closer to the 8000 goal by the end of the year. The target is likely to be hit months ahead at this rate.

Ministry of Transport figures show the fleet size comprises 1327 new light pure electrics (up 63 on December), 3493 used light pure electrics (up 280), 1229 new light plug-in hybrids (up 32) and 477 used light plug in hybrids (up 27). Heavy EVs barely moved, with just one more added to last year's 76.

February 13

Tips for safe home charging

Potential electric vehicle owners need to determine if their properties are suitable for home-charging.

So says EV advocacy group Drive Electric. It's recommending owners get a home assessment done by a qualified professional.

February 14

Smart talk at transport conference

The future of transport will be covered by New York-based *Greg Lindsay* as the keynote speaker at "T-Tech", the Transport Innovation Conference organised by ITS New Zealand in Auckland on March 19 and 20.

T-Tech is to be ITS New Zealand's most ambitious event of the year with more than 200 people expected, representing government, transport, and technology communities.

NZTA invests in charging signs

More signs highlighting where electric vehicle drivers can charge up have been installed by the New Zealand Transport Agency this summer.

It's part of the agency's aim to give EV drivers the chance to hit the open road with confidence.

PM launches car-share service

The Southern Hemisphere's biggest deployment of all-electric cars and largest EV car-sharing model has been launched by prime minister **Jacinda Ardern** in Christchurch.

Yoogo Share, adopted by the Christchurch City Council, will have a pure EV fleet of 100 cars, 10 hubs and 100 chargers available around the city.

Twelve key businesses with 3000 drivers are already working with Yoogo Share cars, removing 115 internal combustion engine vehicles from their fleets.

February 15

First 'un-petrol station' opens

New Zealand's first public solar-powered electric bike charging station is now switched on.

Auckland company Big Street Bikers has teamed up with energy provider Mercury to create the project dubbed the "un-petrol station of the future".

It's positioned next to Auckland's Viaduct Harbour, at the bottom of the Nelson St bike path.

February 16

EVs affected by stink bugs

Electric vehicle importers are among those impacted by the stink bug discoveries which have led to four ships turning away from New Zealand waters.

"I think everyone has cars stuck on these boats," says Henry Schmidt of Autolink Cars in Auckland, which specialises in EVs.

He has 15 used cars on one vehicle carrier, about eight on

another and more on another ship.

February 16

High ranking for NZ's AV readiness

New Zealand ranks ninth out of 20 countries in a report on the state of autonomous vehicles (AV) preparation.

That's according to the KPMG 2018 Autonomous Vehicles Readiness Index (AVRI).

The report says AVs are poised to revolutionise not only transportation but the way people live and work.

February 19

Electric rubbish truck on the job

The first electric side-loader waste collection truck in the Southern Hemisphere is operating on Christchurch streets.

Batteries power every truck function, from the lifting arm and the motor to the computer the driver uses to know which streets to travel down.

Making money from EVs

Renault-Nissan-Mitsubishi Alliance chief executive officer **Carlos Ghosn** says his company is probably the only carmaker who's starting to make money selling electric cars.

Ghosn says it takes time to make money out of electric cars but the Franco-Japanese auto partnership has mastered the business, *CNBC* reports.

Fourth funding round opens

Up to $4 million is offered in the fourth round of the Government's low emission vehicles contestable fund which opened for applications on February 20.

The fund, administered by the Energy Efficiency and Conservation Authority, offers up to 50% funding towards projects supporting the uptake of electric vehicles in New Zealand. Applicants must match or exceed the amount granted.

AI Day conference on March 28

Autonomous shuttle developers Ohmio Automotion's research and development coordinator **Mahmood Hikmet** is among about 20 speakers at AI Day.

Billed as "New Zealand's premier artificial intelligence event", it's on March 28 at the ASB Waterfront Theatre in Auckland and is presented by AI Forum NZ and NewZealand.ai.

Ohmio Automotion's first commercial vehicle, an electric 12-seater self-driving shuttle, all to be deployed by May.

February 26

Electric spark to car events

Car events are increasingly taking an electric focus.

Electricarna, a new event for EVs coinciding with Americarna, was held in New Plymouth on February 24.

The New World carpark, next to the city's sole EV charging station, hosted the event which was amed at educating people about EVs, *Stuff* reports.

EV TALK DIARY

EVtalk Australia editor Geoff Dobson looks at the month gone by on **www.evtalk.com.au**

February 13

Can I get an EV charge with that?

Armadale McDonald's has become the first Golden Arches restaurant in Western Australia to provide a charging station for electric vehicles.

The 24-hour Schneider AC station has twin 22kW sockets each capable of delivering up to 22kWh per hour. It is part of the Charge Star Network.

Hydrogen power plant planned

A $117.5 million hydrogen electrolyser power plant will be built near Port Lincoln in South Australia.

It's expected to boost Australia's "hydrogen economy" and aid "green" hydrogen exports to Asia-Pacific region markets, Manufacturers' Monthly reports.

Hydrogen is widely touted as a range extender in fuel cell form for electric vehicles, particularly in the long-range heavy transport industry.

February 15

South Australia ploughs on to autonomy

South Australia's push toward driverless vehicles continues with a 10-passenger autonomous shuttle to commence trials later this year.

The Local Motors-made "Olli" shuttle, launched in 2016, is part of a $1.6 million trial, partly funded by the state government, that will run 1km along the Glenelg beachfront.

February 20

Charging towards 5000 EVs

An Australian start-up is driving a programme to get almost $200 million worth of electric vehicles on South Australian roads by 2020.

Evenergi is leading the Charge Together South Australia programme to get more people into EVs, and aims to have 5000 there within two years.

February 26

EVs offered free rego

The South Australian Labor Government will waive stamp duty and offer five years of free registration on all new electric vehicles if re-elected.

Owners of new EVs costing more than $40,000 will save over $2000 in stamp duty and rego across a five-year ownership as the SA Government continues its push for a low-emission fleet.

February 27

Green light for driverless road trials

Autonomous vehicles can now be trialled on Victorian roads after legislation was passed by the state government.

VicRoads can grant permits to individuals or organisations wanting to hold automated vehicle road trials under the Road Safety Act changes.

EV CHARGING LOCATIONS

bought to you by AUTOHUB FORWARD TOGETHER your leading logistics team for Japanese and UK used EVs

Fast Charger Locations – North Island

Kaitaia -	Te Ahu, 28 South Rd,
Kerikeri -	1 Butler Rd
Kawakawa -	4 State Highway 1
Tikipunga -	Paramount Plaza, 1 Wanaka St, Whangarei
Whangarei -	Northpower Substation,11 Alexander St
Raumanga -	McDonalds, 130 Tauroa St, Whangarei
Dargaville -	Totara St Parking, 113 Totara St
Kaiwaka -	1 Kaiwaka-Mangawhai Rd
Warkworth -	New World, 6 Percy St
Warkworth -	BP Warkworth, 67 Auckland Rd (SH1)
Silverdale -	Kings Plant Barn, 17 Hibiscus Coast Highway
Albany -	The Warehouse, 186 Don McKinnon Drive, Albany
Rosedale -	McDonalds, 14-16 Constellation Dr, Auckland
Kumeu -	Kumeu New World, 120 State Highway
Henderson -	Pak'n'Save, 224 Lincoln Rd, Auckland
Auckland -	21 Hobson St
Auckland -	Z Station, 150 Beach Rd
Hobson St -	Vector Substation, 21 Hobson St
Beach Rd -	Z Station, 150 Beach Rd
Newmarket -	1 Gillies Ave, Auckland
Greenlane -	McDonald's, 320/356 Great South Rd, Auckland
Pakuranga -	BP Station, 322 Pakuranga Rd, Auckland
Botany Downs -	Z Station, 550 Te Irirangi Dr, Auckland
Auckland Airport -	Airport Shopping Ctr, 400 George Bolt Memorial Dr
Auckland Airport -	Z Skyway, George Bolt Memorial Dr
Takanini Village -	30 Walters Rd, Auckland
Coromandel -	44 Woolams Rd
Whitianga -	4 Lee St
Tairua -	Tokoroa Rd Carpark, 6 Tokoroa Rd
Pukekohe -	King Street Carpark (Seddon Lane), 56-60 King St
Pukekohe -	Counties Power, 14 Glasgow Rd (Business hrs only)
Thames -	505 Mackay Street
Whangamata -	100 Hetherington Road
Te Kauwhata -	16 Wayside Rd
Te Rapa -	WEL Networks, 114 Maui St
Hamilton -	Tesla Supercharger, The Base, Te Rapa Rd & Wairere Dr
Hamilton -	Caro St Carpark, 7 Caro St
Hamilton -	Pak'n'Save, Clarence St,
Ruakura -	Waikato Innovation Park, 9 Melody Ln, Hamilton
Raglan -	43 Bow St
Mt Maunganui -	Bayfair, 19 Girven Road, Mt Maunganui Rd
Cambridge -	73 Queen Street
Te Awamutu -	10 Scout Lane
Whakatane -	i-SITE, 30 Quay St
Opotiki -	i-Site, 70 Bridge St
Te Kaha -	Te Kaha Beach Resort, 3 Hotel Rd, SH35
Rotorua -	1134 Haupapa St
Matawai -	6522 Matawai Rd
Tolaga Bay -	43 Cook St (25kWh charger)
Te Kuiti -	New World, 39 Rora St
Taupo -	Taupo Fire Station, 1 Kaimanawa St
Taupo -	Tesla Supercharger, 1 Kaimanawa St
Gisborne -	21 Gladstone Rd
Rangitaiki -	Rangitaiki Lodge Café, 3281 SH5
Turangi -	1 Pihanga Rd
New Plymouth -	66 Courtenay St
Wairoa -	75 Queen St
Te Haroto -	Mc Vicar Rd, Napier-Taupo Highway, 4237 SH5
Waiouru -	State Highway One & Hassett Dr
Napier -	206 Dickens St
Hastings -	100 Queen St W
Mangaweka -	2 Koraenui St
Waipukurau -	34 Russell St
Dannevirke -	24B Gordon St
Woodville -	i-SITE, 43 Vogel St
Palmerston North -	i-SITE, 126 The Square
Palmerston North -	Tesla Supercharger, 365 Ferguson St
Otaki -	155-163 Main Hwy
Masterton -	3 Dixon St
Porirua -	2 Serlby Pl
Featherston -	SuperValue, 42 Fitzherbert St, Rimutaka Hill
Upper Hutt -	24 Queen St, Upper Hutt
Lower Hutt -	Dowse Art Museum, 1 Stevens Grove
Petone -	Z Station, 60 Hutt Rd, Lower Hutt
Te Aro -	Z Station, 174 Vivian St, Wellington

Fast Charger Locations

Destination Charger Locations

Tesla Charger Locations

Fast Charger Locations – South Island

Takaka -	16 Willow St
Nelson -	Millers Acre Carpark, 37-39 Halifax St E
Richmond -	Tasman District Library, 11 Mcglashen Ave
Greymouth -	13 Tarapuhi Street
Kaikoura -	51 West End
Culverden -	27A Mountain View Rd
Northwood -	New World, 2 Mounter Ave, Christchurch
Harewood -	Raeward Fresh, 800 Harewood Rd, Christchurch
Addington -	Z Station, 40 Moorhouse Ave, Christchurch
Halswell -	New World, 9 Nicholls Rd
Rolleston -	New World, 90 Rolleston Dr
Lincoln -	New World, 77 Gerald St, Lincoln 7674
Little River -	4235A Christchurch Akaroa Rd
Rakaia -	Rolleston St
Ashburton -	109 West St
Tekapo -	Lake Tekapo Tavern, State Highway 8
Fairlie -	Opposite 53 Main St
Geraldine -	Cox St Carpark, 14 Geraldine-Fairlie Highway
Twizel -	Twizel Events Centre, 61 McKenzie Dr
Timaru -	26A North St, Timaru
Omarama -	4 Sutherland Rd
Kurow -	Wynyard St
Wanaka-	42 Ardmore St
Waimate -	125 Queen Street
Oamaru -	Eden St Carpark, 3 Eden St
Ranfurly -	31 Charlemont St E
Alexandra -	9 Thompson St, Bridge Hill
Hampden -	33 Lincoln St
Dunedin -	Filleul St Carpark, 193 Moray Pl
Roxborough -	22 Jedburgh St
Lawrence -	Four Square, 19 Ross Pl
Winton -	New World, 293 Great North Rd
Gore -	New World, 8 Irk St
Balclutha -	23 Charlotte St
Invercargill -	116 Esk St