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OCTOBER 2019

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LEAF ENGLISH CONVERSION ADVANCES

English upgrades for the Nissan Leaf are being refined and produced through Christchurch-based EVs Enhanced and its partners.

The Connect English Translation is for AZE0-2 X and G Spec Japanese Nissan Leafs.

Development has also begun on ZE1 Leafs following the addition of Android Auto to the ZE1 Connect units, with more products along this line expected to be available this year.

Walter Larason of EVs Enhanced says key aspects of this latest English conversion include full text conversion, GPS synchronised to local time, full control of climate and charge timers, the retention of all original Japanese functions such as FM Radio, CD, Music Box, Bluetooth, Phone and more, and Voice Control via Google Assistant or Apple's Siri available via the Bluetooth connection.

Limitations are that the built-in voice functions remain in Japanese, a band expander (usually costing around $30) is required if not already added at the importation stage, and local maps are not included.

The Connect English Translation is $345 including GST, installed by EVs Enhanced and its partners.

That's more than $200 cheaper than an earlier full English conversion for the Leaf from an overseas company which used the Nissan Carwings audio navigation unit.

It was released early this year and is already installed into many New Zealand Leafs. However, the nearly $570 cost disappointed many people, particularly as some of the vehicles wanting this service are eight years old.

Increased differences across hardware versions found in later Connect units proved a more significant challenge in providing an English solution.

Many parties tried repeating earlier methods of using European firmware, but the differences in hardware left the units only partially functional - breaking aspects like CD Player, Maps, Music Box and even FM radio entirely, EVs Enhanced customer service manager **Barry Gamble** says.

"While our main focus is on the development of HV battery solutions, the lack of viable solutions for Connect units in conjunction with the disappointing price point on the previous Carwings conversion, had made us open to developing a more suitable product," he says.

"When Ethan from Flip to English approached us with a proof of concept

The Connect English Translation

for English conversions in these Connect units, a partnership was established and together we developed this AZE0-2 Connect English Translation."

This product has been fine-tuned with the assistance of Christchurch-based Leaf owners who have been trialling these conversions in the weeks leading up to the launch.

"We have taken a very open approach to development by encouraging our triallists to share their experiences with other members of the EV community. This ensured we developed a product that Leaf owners want," Gamble says.

It's available now to Christchurch customers through the EVs Enhanced Service Centre and will soon be available nationwide through a network of partners.

Contact **enquiries@evsenhanced.com** or visit **www.evsenhanced.com** for more information. ■

EV CHARGERS FOR BUILDINGS

Suppliers of EV chargers were well represented at Facilities Integrate - a trade-only exhibition for people who manage, secure, develop, design, influence and revolutionise New Zealand's buildings and facilities.

The two-day event at the ASB Showgrounds in Auckland included ABB, TransNet, YHI Energy and Schneider Electric.

New inner-city developments are coming with little car parking, some allowing for just a few EVs (particularly carshare).

Most EV charging is at home, so needs to be integrated into the building's electrical infrastructure.

EV charging suppliers says shows like Facilities Integrate help get the message across and enable people involved with the building industry to understand what is needed.

YHI Energy's **Jasmine Roxborough** says. "Facilities Integrate tends to bring together delegates who find value in the synergy of our entire energy division offering. Having one supplier for EV charging, UPS and battery products as well as our strong solar channel model means we become a strategic partner for many of our valued customers,"

"Both days product specialists were on hand to answer questions and provoke a forward-thinking, future-proofed approach."

TransNet's **Glenn Inkster** says the biggest change for people getting into EVs is the charging.

YHI's display at Facilities Integrate

"We're simply never going to have as many DC chargers as we have petrol stations because a lot of the charging happens at home, whether that's in an apartment complex or at work," he says.

"The key thing with EVs is integrating them into the existing electrical infrastructure for your building." ■

ELECTRIFYING CONVERSATIONS SPARK UP EV DISCUSSIONS

The first Electrifying Conversations Conference on November 1 is sure to fire up talk around EVs and sustainable transport.


Philippe Vangeel

Stemming from **Dee West's** new podcast of the same name with its wider sustainability focus, Electrifying Conversations coincides with Big Boys Toys' Electric Avenue EV exhibition at the ASB Showgrounds in Auckland's Greenlane.

Electric Conversations will cover the whole picture of sustainability and energy independence in New Zealand, as well as new zero-emission technology advances from around the world.

Keynote speakers include **Philippe Vangeel**, the European Association for Electromobililty (AVERE) secretary general talking about the European EV market and transportation switch, electric motorcycle land speed record setter **Eva Hakansson**, Kiwi tech entrepreneur and Xero founder **Rod Drury**, and electrical engineer and Dynami chief executive officer **Sergio Baron** discussing battery technology.

The keynote sessions will be combined with interactive panel discussions featuring sector experts focusing on developments within the transport, energy, software, tourism, charging infrastructure and EV hardware sectors.

"We aim to make these interesting and interactive, so don't expect death by PowerPoint," West says.

The Electrifying Conversations Conference aims to become an annual fixture, providing a platform for New Zealand to celebrate advances within zero emission technology, helping the country become a world leader in clean transportation with its nearly 85% renewable electricity generation.


Eva Hakansson

Following immediately on from the conference, a convoy of about 20 EVs will hit the road with invited guests covering more than 1000km from November 3-8.

About 50 people are expected on the road trip from Auckland to Wellington, including stops along the way for EV rides and drives, a journey down the Forgotten Highway and more.

The road trip will be recorded by a documentary team, including a drone operator, and footage will be available in the package for paying participants.

West expects next year's road trip will be in the South Island.

She says the goal of the whole Electrifying Conversations venture is put New Zealand firmly on the world EV map.

"We're singing our own praises with more than 17,000 EVs on our roads and the collaboration and innovation available here."

West says it's important people realise the sustainability zero emissions transport can provide.

She points to an average-sized electric car removing 1kg of emissions for every 6km driven, with reports that more than five million EVs globally are expected to balloon to 23 million within about 10 years.

The first Electrifying Conversations event will be sponsored by ChargeNet NZ, the company recently opening more than 10 EV chargers including Manukau (50kW), Silverstream (25kW), Greenmeadows (25kW) Tirau (two 50kW chargers), Dunedin (50kW), Tekapo (25kW), Petone 25kW), Karori (25kW), and Wellington Zoo (two 25kW chargers).

Contact **Hayley Davey** at **hayley@electrifyingconversations.co.nz**, phone **+64 (0) 21 757 967** or visit **www.electrifyingconversations.co.nz** for tickets and further information. ■

FEEBATE AND EMISSIONS STANDARDS PROGRESSING

Automotive industry representatives discussed the Government's Clean Car proposals on October 8 at a workshop in Wellington with NZ Transport Agency, Ministry of Transport and Energy Efficiency and Conservation Authority representatives.

Associate transport minister **Julie Anne Genter** expects progress to be made on the policies by the end of the year.

She has met vehicle industry representatives to hear their feedback on the proposed Clean Car policies.

That meeting was constructive and generated positive discussion, according to MoT urban development and environment manager **Glen-Marie Burns**.

"There was clear agreement about the need to reduce vehicle emissions in New Zealand and recognition that further detailed work was needed on a number of policy design issues."

The minister gave her assurance ongoing consultation will continue with the vehicle industry as work progresses on developing the Clean Car policies.

The October 8 workshop is the first of several planned between transport officials and vehicle industry representatives to ensure the proposals are practical and effective for New Zealand motorists and the vehicle industry.


David Vinsen

The Clean Car proposals will work alongside other measures the Government has in place to reduce emissions. Such as the low emissions vehicle contestable fund administered by EECA.

The workshop included representatives of the Motor Industry Association of New Zealand (MIA), Imported Motor Vehicle Industry (VIA), the Motor Trade Association (MTA) and others – a good cross representation of the industry, VIA chief executive **David Vinsen** says. ■

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EVtalk Magazine is published by Auto Media Group Limited., 8/152 Quay Street, P.O. Box 10 50 10, Auckland City, 1030. Ph. 09 309 2444.

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Printed by: Alpine Printers.

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‘FUTURE LOOKS REALLY GOOD’ AT HARWOOD CARS

Harwood Cars exterior

Harwood Cars owner **Martin Harwood** has been at his Point Chevalier caryard for more than three years and, although at retirement age, there’s no slowing him down.

“I’m just getting into it and I’m 70,” Harwood says. Originally starting with ICE cars, Harwood credits himself and his friend and then business partner **Henry Schmidt** as one of the first to bring EVs to New Zealand.

Schmidt now owns Autolink Cars in Grey Lynn, one of Harwood’s EV competitors. Harwood has been selling pure electric Nissan Leafs for two and a half years, and believes he is the only solely EV dealership with just Leafs.

After 51 years in the automotive industry, Harwood knows one or two things about being a good car salesperson. And he says finding good salespeople is very difficult, especially for selling EVs.

Martin Harwood

“Once you’ve learnt to sell cars, it is very hard to change over to sell electric cars,” Harwood says. He runs his dealership with just himself and wife **Lorna Harwood**.

Harwood imports his Nissan Leafs from Japan and has plenty of experience importing cars from there.

Now, everything is online, and he doesn’t need to return to Japan, even though he can speak the language.

“I have a broad range of vehicles that would suit most budgets,” Harwood says, in response to a recent AA Insurance survey revealing Kiwis are put off buying EVs due to the price.

“My EVs start off at $10,000,” Harwood says. “New cars, the answer is yes, they are expensive. Pre-owned cars, no.”

Harwood says the government’s proposed boost for EVs through its clean car plans are great but are taking too long to get up and running. He reckons it’s better to buy an EV now and get the savings in fuel and maintenance costs to put towards an EV upgrade in two years when the incentives are expected to kick in around 2021.

“Once it’s been two years you’ve had your two years of petrol savings,” Harwood says. “Which can work out roughly to about $400 a month. Get your savings now.

Harwood’s EV collection includes a five-seater van

“I always instil in people that when you’ve got petrol, you’ve already paid tax. Then you pay tax again to buy petrol. With electric cars, the saving is going back into your pocket.”

Harwood notes some workplaces are installing EV charging stations for their workers; therefore if it’s free it doesn’t cost them anything to run their EV.

Harwood says EVs are an exciting future, particularly as it can now cost about $120 to fill an ICE car with petrol.

“For many with EVs it doesn’t cost them a cent for power. For instance, one lady from Kumeu bought an EV from me and charges her car when she drives to see her horse. She charges her car and goes home, and it costs her nothing to run it.”

He sells his EVs not only through his Pt Chevalier dealership but also on Trade Me and runs Facebook, Instagram, Twitter and Neighbourly accounts, running his business as **harwoodcars.com** on such sites.

“Trade Me Motors is the best place to sell cars,” he says.

Once old school, Harwood has learned to “grasp the nettle” and go with social media.

“Media is the way to go. I concentrate on that. I enjoy social media – I’m a researcher.”

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Harwood runs his dealership on Great North Road, and believes he is one of the top three EV dealerships in Auckland in terms of the quantity of vehicles available in his yard.

While the government's clean car discount or feebate scheme is expected to help boost EV interest when introduced, usually it's a world event affecting petrol prices which has the most impact on EV sales.

When the drone attack on Saudi Arabia's oil facilities happened, Harwood sold three EVs and received five phone enquiries the day after.

"There was a massive interest towards EVs," Harwood says. "People are finding that they are generating savings.

"There was one woman that was thinking about buying an EV for three weeks. This helped her make the decision to get one."

Harwood says if oil shocks continue then EV sales will soar.

Generally, the types of people that come into his caryard can be categorised as "greenies", "pensioners" and "tech geeks", he laughs.

The greenies are interested in EVs because they're environmentally friendly and they care about saving the planet, Harwood says.

Pensioners are the elderly buying possibly their last car and who can afford a $10,000 run-around EV with lower range.

"This group has paid tax their whole life and are giving it [tax] the middle finger," Harwood says. "I've found that rest homes are putting in charging stations. EVs are easy to drive and there's no worrying about servicing and all that carry on."

Tech geeks are the ones that have researched all things EV, Harwood adds.

"Some want to see how much you know."

More than 50 years of experience has given Harwood the ability to read body language well and gauge whether a person wants to be left alone to look around the caryard or wants help.

"I'm not that tough a car dealer," Harwood says. "I like to make people laugh, relax and have them enjoy the buying of a car. Then they tell their friends they had a good time, and that's what we look for."

People like all sorts of colours for their EV, but red is a favourite.

Companies tend to go for white EVs, and many people like black, grey and orange cars, Harwood finds.

When Nissan released its 80th anniversary models, purple, orange and dark blue were available on the Nissan Leafs.

"I can't get enough of them," Harwood says, admitting he'd prefer some brighter Leafs in his yard which is dominated by white, black, grey and blue.

Leather interiors are also very popular but rare in Japanese imports due to Japanese people not liking to sit on dead animals' skins, Harwood reckons.

Wife Lorna does 90% of the sales, while Harwood is in charge of the buying and advertising.

He says this works, as he has found many car buying decisions are made by women.

"Mrs Harwood has the ability to communicate with the ladies," Harwood says, adding she has an ability to help men and women determine what EVs are best suited to their wants and needs.

Harwood Cars believes in the future of EVs, which is why he made the switch many years ago from selling ICE cars to strictly pure electric vehicles and no hybrids – not even plug-in hybrids. ■

Harwood with his EVs

Harwood Cars

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Topping up at Turoa

MODEL 3 GOES THE DISTANCE

Topping up at Te Kuiti. The parking was for the cable to reach.

At least 400 of you now have your Model 3s and you really are lucky. *EVtalk* got to spend 1000km with the car just as deliveries began to trickle out of showrooms, and in most ways it does live up to the hype.

This was a second chance for us. We had already taken the car for a busy 45 minute run. This time we were to have it for four days on relatively short notice, and with a mission to Ohakune already planned for that weekend we figured why not take the Tesla.

We left Tesla Auckland with just a few kilometres on the clock, and headed home to load up. The boot opening of the Model 3 is relatively small, but the boot fantastic. The huge amount of underfloor storage allows you to prank your mate, as I did, asking where his bag had gone. Bags in, jacket in, food in, electric chainsaw in - and on our way.

Though we were not going anywhere fast. The slow-moving carpark that is the Southern Motorway held up progress, although provided a great opportunity to test out the AutoPilot system. In slow traffic like this it is near perfect, and under 15km/h rarely asks for input.

Once motorway traffic sped up it continued to show its skills, though don't forget it doesn't have quite the ability here as you may see on videos from the United States and other markets.

Slip on to typical one lane each way kiwi highways and it is one of the better versions of adaptive cruise control with lane keeping out there, but is no means close to self-driving. It still gets tricked by our patchy road markings and our rather average drivers. Full self-driving preparation adds $8000 to the price.

The Performance we are driving has a sticker price of $101,100. All models are pretty well specified, the Standard Range Plus gets 12-way power adjustable heated front seats, premium seat material and trim, upgraded audio, standard maps and navigation, LED fog lamps, centre console with storage, four USB ports and docking for two smartphones.

The Long Range and Performance get the premium interior package, satellite-view maps with live traffic visualisation and navigation, premium audio with 14

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The first Model 3 at Taupo?

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speakers, in-car internet streaming music and media, internet browser, location-aware automatic garage door opener.

The Model 3 is very nice to drive on a long road trip, the steering is light and easy, the ride comfortable and of course the performance impressive. To be fair, it does not have the sharpness or feel of say a BMW 330i, but the gap as not as big between the 3 and 330i as say the S and the 5-series. The Tesla lacks a little crispness and feel in the steering, and does feel a smidge heavy in corners, but it is pretty darn good.

Then of course there is the performance. Even with three and luggage on board it remains an overtaking weapon. I am not sure we were at risk of achieving the 0-100km sprint in the claimed 3.4 seconds, but it is pretty darn good. The easy access to power at any

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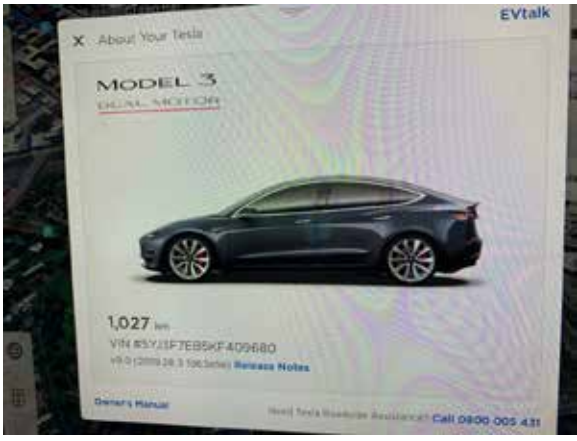
speed - the petrol equivalent of having great midrange is intoxicating.

Still, like my first drive, I do wish Tesla would work to make their modes more adaptable, as Audi has done with the e-tron. Sport still comes with a slightly over-responsive throttle pedal. We got more used to it, and it was less noticeable out of the city, but it is still there.

The interior is dominated by the large central screen that controls most of the vehicle's functions – the only other significant controls are the steering wheel and the combination button/scroll wheels on it. The dash feels low, and the vents – controlled from the screen – run almost full length across it.

The slimmed down design helps the car feel very spacious and it also feels of higher build quality than an S - Tesla seems to have avoided points where soft finishes meet curved edges – it all feels tighter and cleaner.

Our only quality concerns are the piano-black trim on the centre console, which marks very easily, and the boot trim, which was coming away from the edge of the opening on pickup.



Many have complained about the automatic windscreen wipers. Like the rest of the controls, you get used to the on/off and sensitivity being set on the screen, and compared to most other automatic systems, they are not so bad.

If we had to pick our favourite part of

Continued on page 11

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the interior it has to be the front seats. They look simple, but few brands, maybe only Volvo and Mercedes-Benz, have seats that are so comfortable for Kiwi-sized drivers over long distance. We suffered little stiffness or fatigue, and want a set to have at home.

Charging on

With traffic, weekend competition for charging spots, and not leaving with a full battery into account, we charged where we could, rather than pushing for outright range. Having said that, the Model 3 always felt like we could easily get into the mid-300km range on a charge. Amusingly while heading down Mount Ruapehu it suggested we could go 999km.

Our first charging pitstop was Te Kuiti, where we discovered a wee mismatch between the Tesla and the ChargeNet Veefil – the outlet is on the opposite side to the cable. Here, this just means overlapping the car into the loading zone adjacent, and for most others it will just require backing into the left-hand carpark. Something to be aware of. Reverse parking is also the only option for most DC chargers for the 3.

The next morning we dropped the car off for a top-up at ChargeNet unit in Ohakune. The cable is not so much of a stretch here. On both Chargenet units we saw around 42-44kW of peak charge, not the 50kW promised, but not unexpected and still fine for a top-up.

While at the top of the mountain we sipped from the 11kW Tesla units kindly provided by Ruapehu Alpine Lifts. This again required a reverse approach, with the four wheel-drive and traction systems clicking away as the car shuffled itself up on to icy snow.

The return trip required a near full charge at the Taupo Supercharger. Our charging numbers cracked an impressive 120kW, adding hundreds of kilometres per hour – it is an impressive site to see. The new CCC2 cables on the units work exactly the same way as the standard ones, no learning curve required.

We did charge one more time on the way home, even though we didn't need too. It was at Cambridge, it was dinner time, and the Chargenet site is too close to KFC to ignore. Don't judge us!

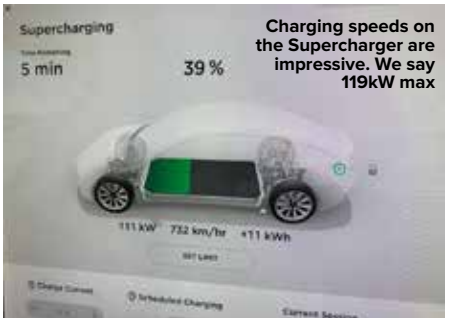
The full package

So after 1000km are we still convinced the Model 3 lives up to the hype? Oh yes.

It drives well, it looks great, it is comfortable, it is practical. There is little not too like about this car as long as you get used to its unusual format, and of course you can work through the build quality niggles a few have found.

We hear the Tesla Auckland staff have been great and more than willing to deal with this kind of thing.

It may lack a little of the precision in driving of its European ICE competitors, but in so many ways offers much, much more.



Charging speeds on the Supercharger are impressive. We say 119kW max

EV BATTERY SECOND-LIFE PROJECT STARTS

A project is under way to evaluate the need for a specific strategy for New Zealand to ensure retired EV batteries still provide maximum return before heading to recycling.

The project carried out by Strategic Lift is jointly funded by the Waste Minimisation Fund and Winstone Wallboards.

The $40,000 funding from the Waste Minimisation Fund, which represents two thirds of the project cost, was approved by associate environment minister **Eugenie Sage**.

Winstone Wallboards is interested in the built-environment implications of second-life batteries installed as stationary storage in residential, commercial, or industrial applications.

The company's sustainability manager **Kevin Golding** is checking out how this would work.

"The project involves reviewing the extensive literature about EV batteries and potential second life applications, as well as interviewing industry players from car manufacturers to importers, to battery recyclers and the growing community of potential participants in a second-life industry," Strategic Life chief executive officer **Paul Minett** says.

It aims to estimate the flows of batteries coming out of EVs in New Zealand, when those flows will occur, what the batteries' remaining capacity will be, and therefore what would be available for second-life use.

"Initially, there was an understanding that a battery would stay in a car for perhaps eight to 10 years, while it got down to 70% or 80% of its original range, and then be removed and replaced with a new battery," Minett says.

"This was expected because of the importance given to range anxiety, that car owners would not want a vehicle that wouldn't deliver occasional long trips.

"Finding a use for those 70%-80% capacity batteries so that the remaining capacity could be beneficially used before the battery entered the recycle stream would therefore be important.

"It would be especially important by the time the majority of the vehicle fleet is electrified and each year there would be a virtual torrent of second-life-available batteries coming on to the market.

"What the research is telling us, and we are hearing from people in the industry, is that quite a different picture is emerging," Minett says.

"The earliest EVs are now over eight years old and, while some people would like to refresh their battery, the most likely use of their old one would be refurbishment and exchange back into another EV.

"There is a lively market for eight-year-old EVs that still have sufficient range to meet the owner's needs. Range anxiety seems to disappear, especially when there is ample charging availability."

Minett says the technology exists, and many pilot projects around the world are testing different second-life applications.

"But the reality is that it is difficult at the moment to source any volume of ex-EV batteries.

"Much of the activity in this space is predicated on the assumption of a large supply of cheap, quite high capacity used batteries.

Paul Minett, left, and Kevin Golding

"We are finding that this assumption needs to be challenged. The cars might last a lot longer, the batteries might stay in the cars a lot longer, and the batteries when they become available for second life might have much less capacity, than has previously been expected."

Minett says it might be ecologically desirable for those batteries to go into a second life but questions whether it will be economically viable.

"When you consider that the second life applications could equally be filled using new batteries, and the price of new batteries 20 years into the future could be quite a lot lower than the price today, the economic question becomes really important."

Taken together with the economic viability of recycling, where at present the value of the recovered minerals is lower than the cost of the recycling process, the risk of a flow of used EV batteries to landfill appears much greater, Minett says.

He's interested in in connecting with people with knowledge of this topic. Phone **021 289 8444** or email **paulminett@strategic-lift.com** for more information.

See P27 for BlueCars' work on EV batteries.

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Hyundai	Ioniq	BEV	$59,990	220 km
	Ioniq Elite	BEV	$65,990	220 km
	Kona	BEV	$77,990	400 km
	Kona Elite	BEV	$83,990	400 km
Jaguar	I-Pace S	BEV	$144,900	470 km
	I-Pace SE	BEV	$154,900	470 km
	I-Pace HSE	BEV	$164,900	470 km
Kia	Niro EX289 (39 kWh)	BEV	$68,990	289 km
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LDV	EV80	BEV	$80,489	180 km
Nissan	LEAF	BEV	$59.990	270 km
Renault	Zoe 40 kWh	BEV	$68,990	300 km
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BMW	i3 - Range Extender	PHEV	$84,500	200 km + 130 km
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	530e	PHEV	$136,400	50 km + 600 km
	740e	PHEV	$202,700	48 km + 550 km
	X5 xDrive40e	PHEV	$152,700	30 km + 800 km
Hyundai	Ioniq Plug-in	PHEV	$53,990	63 km + 1040 km
	Ioniq Plug-in Elite	PHEV	$59,990	63 km + 1040 km
Kia	Niro	PHEV	$55,990	55 km + 850 km
Mini	Countryman	PHEV	$59,900	30km + 500 km
Mitsubishi	Outlander	PHEV	$55,990	50 km + 500 km
Mercedes Benz	C350 e Sedan	PHEV	$96,400	31 km + 700 km
	C350 e Estate	PHEV	$99,400	31 km + 700 km
	E350 e Sedan	PHEV	$143,500	30 km + 600 km
	GLE500 e	PHEV	$149,900	30 km + 700 km
	S500 e	PHEV	$255,000	30 km + 700 km
Porsche	Cayenne S e-hybrid	PHEV	$177,800	20 km + 750 km
	Panamera Turbo S e-hybrid	PHEV	$428,400	30 km + 750 km
Toyota	Prius Prime	PHEV	$48,490	50 km + 1000 km
Volvo	S90 T8	PHEV	$125,900	34 km + 600 km
	XC90 T8	PHEV	$134,900	44 km + 600 km
	XC60 T8	PHEV	$94,900	40 km + 600 km

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

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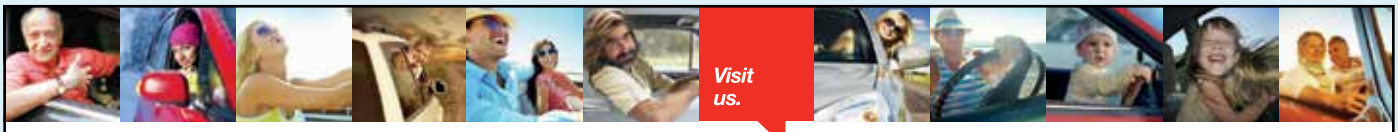

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MAKE	MODEL	TYPE	PRICING RRP EST.	APPROX RANGE KMS
BMW	i3 - 22 kWh	BEV	$35k - $45k	120 km
	i3 - 33 kWh	BEV	$52k - $80k	200 km
Hyundai	Ioniq	BEV	$47k - $55k	220 km
	Ioniq Elite	BEV	$57k - $66k	220 km
	Kona	BEV	$74k	400 km
Kia	Soul EV	BEV	$30k	150 km
Mercedes Benz	B250 e	BEV	$44k - $47k	140 km
Mitsubishi	i-Miev	BEV	$11k - $14k	100 km
	B-Miev Van	BEV	$16k	100 km
Nissan	LEAF Generation 1	BEV	$9k - $16k	120 km
	LEAF Gen 2 - 24 kWh	BEV	$13k - $34k	135 km
	LEAF Gen 2 - 30 kWh	BEV	$26k - $36k	180 km
	LEAF ZE1 - 40 kWh	BEV	$43k - $63k	250 km
	e-NV200 - 24 kWh	BEV	$27k	140 km
	e-NV200 - 40 kWh	BEV	$60k	200 km
Renault	Zoe 40 kWh	BEV	$37k - $68k	300 km
	Kangoo ZE Van	BEV	$42k - $46k	160 km
Smart	Fortwo	BEV	$20k	100 km
Tesla	S P85D	BEV	$95k - $120k	330 km
	S 90D	BEV	$125k	420 km
	X 75D	BEV	$109k	340 km
	X 90D	BEV	$129k	410 km
	X 100D	BEV	$149k	480 km
	X P100D	BEV	$230k	460 km
Volkswagon	e-Golf - 36kWh	BEV	$63k - $70k	220 km
Audi	A3 Sportback E-Tron	PHEV	$41k - $50k	45 km + 600 km
	Q7 e-tron	PHEV	$125k	54 km + 800 km
BMW	i3 REX - 22 kWh	PHEV	$33k - $50k	120 km + 120 km
	i3 REX - 33 kWh	PHEV	$50k - $68k	200 km + 120 km
	225xe	PHEV	$50k	41 km + 550 km
	330e	PHEV	$50k - $76k	37 km + 550 km
	530e	PHEV	$140k	50 km + 600 km
	X5 xDrive40e	PHEV	$140k	30 km + 800 km
	i8	PHEV	$110k - $140k	37 km + 400 km
Hyundai	Ioniq	PHEV	$46	63 km + 1040 km
Mercedes Benz	C350 e Sedan	PHEV	$63k - $75k	31 km + 700 km
	GLE500	PHEV	$130k	30 km + 700 km
	E350 e	PHEV	$120k	30 km + 600 km
	S500 e	PHEV	$96k	30 km + 700 km
Mini	Countryman Cooper SE	PHEV	$68k	30km + 500 km
Mitsubishi	Outlander	PHEV	$27k - $56k	50 km + 500 km
Porsche	Cayenne S e-hybrid	PHEV	$129k	20 km + 750 km
Toyota	Plug-in Prius	PHEV	$17k - $22k	26 km + 800 km
Volvo	XC60 T8	PHEV	$115k	40 km + 600 km
	XC90 T8	PHEV	$115k	44 km + 600 km

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

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The Electric Motor Vehicle Company 03 218 7130 | 027 515 8799 info@electricmv.co.nz	Invercargill

GO RIDE AN E-BIKE


Christian Hoff-Nielsen

BY DARLEEN TANA

Back in 2013, sales of electric bikes were fairly limited to a white step-through frame and ... a white step-through frame.

The SmartMotion eEssence came with a two-year warranty on the motor and battery (360Watt/hours) and a price tag of $2499.

The manufacturer, Smart Motion - a New Zealand company - was years ahead of the game.

There were no real competitors in the market - largely because there was no market of which to speak.

Time has rolled on and so too, thankfully, have customer choice options in terms of frame designs, colours, battery range/resilience, and motor technology.

More players have entered the market. These include both new, low volume, niche manufacturers as well as the larger, traditional bike manufacturers.

The market is opening wider still as non-traditional bicycle manufacturers such as those from car and motorcycle firms team up with frame designers to bring their motor and drive-train expertise to bear.

Too many traditional bike shops have closed due to a collapse in sales of pedal bikes; parts suppliers being caught out for not carrying enough basic items like brake pads (yes, e-bike's use them) and a general lack of qualified technicians.

We can expect yet further disruption across manufacturing, distribution and sales channels, and transportation modes such is life at the beginning of a new micro-mobile industry.

In this guest editorial, Bikes and Barbers focuses on what we see as major trends for e-bike development and implications for New Zealanders looking to buy one.

We will be sharing challenges (and opportunities) for the e-bike industry (November issue) and giving a heads up on some exciting developments arriving over the course of 2020/2021 (January issue).

Bikes and Barbers' **Christian** and **Darleen Tana Hoff-Nielsen** were recently invited to Switzerland to view the new range of Scott e-bikes for 2020.

Scott Sports is not so well known in New Zealand but it is certainly renowned in the USA and Europe for their decades-long contribution to high-performance sports - including cycling.

It was incredible to meet the super talented people behind the brand and a fantastic opportunity - clearly, to be first in the world to view (and test ride) the latest Avanti, Scott, and Bergamont e-bikes to hit the market.

It was clear from travelling through Switzerland, Austria, Germany, the Czech Republic and Denmark that e-mobility is gaining in political popularity to address congestion, pollution, and health issues. Banned use of diesel vehicles, increased pedestrian zones, public transport (electric, of course), separated cycle paths, and e-bike and e-scooter rentals are just some examples of initiatives rolling out across Europe.

European standards for design and manufacture are certainly very high.

They sit at the top end of the price range for an e-bike ($5000 upwards for a commuter). While this price point may seem steep to many Kiwis, after servicing thousands of e-bikes these last seven years, we can attest to their value and quality componentry.

Many e-bikes at these higher price points have potential to be your bike for life. Longer-range batteries (from 630W/h) and speed regulation around 32km/h look to feature for bikes coming from the traditional bike manufacturer.

While Bosch seems to be winning with the larger frame makers, do keep an open mind for some of the other mid-drive manufacturers (Brose, Dapu, Bafang, Yamaha, Shimano, etc).

We observe New Zealand developers are still leading the way in terms of building e-bikes that are relevant for our volcanic terrain, bigger bodies, and "unicorn aspirations" for what a bike can do.

Watt Wheels, Hiko Bikes, eVinci, and ONYA join the Kiwi-led charge to manufacturing and delivering e-bikes that respond to Kiwi demands for accessible price points also.

Priced between $2000 and $4000 and built largely in China with Dapu or Bafang mid-drive motors, the e-bikes are proving their worth in value for money, reliability, and performance.

While ride geometry or componentry choice could always be better, the return on investment is worthwhile and an experienced bike person can advise tuning or improvements to widen your smile.

We advise people to just go and test ride ... as many bikes as you can.

Find the e-bike most comfortble and buy from the retailer who will look after you for the life of your bike.

The Hoff-Nielsens are specialists in electric mobility, having come out of the European motor vehicle sector.

They are supporters of small, independent businesses working innovatively with communities to encourage conscious choices for the well-being of people and the planet.

Bikes and Barbers is their main retail, service, and rental activity and they are both active with several cycle, school, community, and business associations.

Darleen is also a founding member of the Electric Island Trust on Waiheke Island, aiming to make it the world's first fully electric island. ■

LIVALL EXPANDING ITS RANGE

Livall's new smart urban helmet has many advanced safety features - ideal for cyclists, e-bike, e-scooter and skateboard riders.

Standouts are a front LED light – avoiding the need to buy extra strap-on ones – plus brake warning lights at the rear with in-built sensors detecting when the rider slows quickly.

Automatic sensors mean the lights can turn themselves on in failing light or at night.

Due on the New Zealand market shortly, the BH51M Neo also has a fall detection alarm and you can press an SOS button on a handlebar attachment that comes with it to signal for help. A GPS locater allows a specified emergency contact to be automatically called in the event of an incident.

In-built speakers and Bluetooth mean you can use a smartphone hands-free. The Livall helmet was developed by Chinese national **Brian Zheng** after he broke an arm in a fall from his bike in New Zealand while fishing his phone out of his pocket.

A phone holder can be attached to the handlebars to take photos and videos during the ride too.

Turn signals on the helmet are activated by pushing right or left buttons on a linked handlebar device, rather like the helmet's predecessor.

But this helmet is recharged with a magnetic USB cable fitting, which avoids an earlier problem where the helmet's female charging input became damaged and perhaps unusable through frequent use.

Real-time group communication means the rider can also talk with and hear other riders with similar devices.

Using Livall apps (Android and IOS) allow some features like the SOS alert to work.

Designed for comfort, the helmet has a high strength ABS shell and an internal lining designed to absorb some impact during a fall or incident.

The battery has about 10 hours lighting time before needing recharging, and the helmet is reasonably waterproof - although a guide supplied with it suggests avoiding a long ride in rain or at least drying it out afterwards in a ventilated environment.

Livall's New Zealand, Australia and Dubai sales and marketing director **Sanchit Mittal** from Auckland, has been promoting the brand for the past three years and sees it developing rapidly in related fields.

Sanchit Mittal

It's now a global company, involved in 60 countries and making big inroads in Europe and about to kick into gear in the US.

"I saw e-mobility was going to go crazy in a few years where safety has to go hand in hand with technology, which is Livall's primary focus," Mittal explains as a key reason he became involved with Livall.

An occasional cyclist, Mittal sees Livall's safety emphasis as a big plus for the brand – the only one offering an SOS alert, for instance.

While Livall is about five-and-a-half years old and deals mainly with helmets, it's also got an eye on the future of e-mobility with more to be announced in that field.

Meanwhile, Livall advocates have been telling their stories about how the helmet saved them from severe head injury or worse in videos.

The company says one of the main fears among about a billion recreational road cyclists globally is being hit by a vehicle.

It suggests investing in the right gear to help reduce the chances of a serious accident, saying research highlights the key factors as helmet wearing, visibility, and limiting rider distraction.

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

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WHAT'S HAPPENING?

ITS World Congress, Singapore
@ Suntec, October 21-24
*Contact ITSNZ for promo opportunities & networking events

ITSNZ Awards
Entries open soon.
Awards night TBC, February 2020

LOCAL EVENTS

ITS World Congress Review events
Auckland, November 12
Wellington, November 14
Christchurch, November 19

T-Tech 2020
May 4-5, Wellington

INTERNATIONAL EVENTS

October 21 - 25 2019
ITS World Congress
Singapore
Themed *'Smart Mobility, Empowering Cities'* the ITS World Congress attracts 10,000 delegates and covers all aspects of Intelligent Transport and Smart Cities. ITSNZ has an expo stand and events planned.

May 25 – 29 2020
ITS Asia-Pacific Forum
Brisbane

ITS World Congress 2020
October 4-8, 2020, Los Angeles

TAKING NEW ZEALAND TRANSPORT TECHNOLOGY AND EXPERTISE TO THE WORLD


Simon McManus

BY SIMON MCMANUS, EXECUTIVE OFFICER, INTELLIGENT TRANSPORT SYSTEMS NEW ZEALAND INC

About 20 New Zealanders will take the stage at the Intelligent Transport Systems World Congress in Singapore this month, leading the future transport conversation on a wide range of exciting topics including Autonomous Vehicles, Congestion Management and Cybersecurity, and much more.

Excitement is building for the congress, which combines expert presentations and discussions, a congress exposition and demonstrations of new technology.

The final congress programme has been published and includes numerous New Zealand speakers and moderators.

More than 50 New Zealanders will be in Singapore to learn about the latest in connected transport and smart city technologies, to promote New Zealand and develop international relationships.

ITS New Zealand has partnered with ITS Australia and ITS Asia-Pacific in an expo stand showcasing New Zealand. Supported by our membership and key exhibitors including; CSL Infrastructure, who will be showcasing an accessibility solution of connected infrastructure for blind and vision-impaired pedestrians; premium exhibition partner Alloy showcasing their connected asset management platform Yotta, which is being used by Auckland Systems Management that operates Auckland's motorway network.

The congress is also a fantastic networking opportunity and ITS New Zealand is co-hosting a VIP event in Singapore giving members an exclusive opportunity to build international relationships.

World-firsts will be showcased, including the world-first full-scale air taxi "vertiport" prototype featuring Volocopter, the world's first full-size electric autonomous bus being trialed on public roads, as well as several connected vehicles, driver assist programs, and smart public transport solutions of shuttles and buses.


The Volocity transporter

The eight themes for the congress include:

1. Intelligent Connected Vehicles
2. Crowdsourcing & big data analytics
3. Sustainable smart cities
4. Multimodal transport of people and goods
5. Safety for drivers & vulnerable users
6. Policies, standards and harmonisation
7. Innovative pricing and travel demand management
8. Cybersecurity and data privacy.

Continued on page 19

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MOVING UP – READYING VERTICAL TRANSPORT COMMUNICATIONS

By Ritch Mitchell,
Aurecon senior intelligent transport systems engineer

It's not a futuristic vision anymore to imagine flying taxis, like in the movie The Fifth Element, set in the 23rd century with **Bruce Willis** as a flying taxi driver.

That's because they're in production along with a variety of other flying transportation vehicles.

More than 54% of the world's population is now living in urban areas, and traffic jams are a daily occurrence. Flying vehicles could be one solution.

Manufacturers are prototyping and testing vertical transport systems; electric flying vehicles, vertical take-off and landing (VTOL) vehicles such as Cora being trialled here, automated drones and remote piloted aircraft (RPAs).

These flying vehicles can take off, hover and land vertically on the tops of tall city buildings or designated open spaces, and don't require runways. You might say that helicopters have been doing this for years, but the difference with electric flight is that it's far quieter, they can fly lower, and they are more sustainable with low emissions.

There is no precedent for regulation or legislation to guide these types of ground-air vehicles taking to the sky. So, while the technology is rapidly progressing, civil aviation rules and legislative frameworks also need to progress to inform how these vehicles operate.

Vital to moving into the sky is transport communication between vehicles, airspace controllers and people. We know that communications are necessary for traditional airspace navigation functions such as distance measurement, instrument landing and global positioning. But VTOL vehicles and RPAs are adding an extra level of complexity.

Future communications systems will need to enable communication directly with individual consumers, provide flight safety for a potentially high volume of vehicles, and attach to small vehicles with minimal weight allowance.

The progress of vertical communications architecture needs to be considered together with the progress in the structural technology of flying vehicles. While possibly daunting, the challenge of how to integrate and co-ordinate communications systems isn't insurmountable, merely one that's important to address early.

As reported by CBINSIGHTS in January 2018, Amazon has a patent for the design of a new flight management system that uses sensors, processors and wireless communication to enable the automated, always-on detection of unmanned aerial vehicles (UAVs) operating within the airspace occupied by another UAV.

While these communications technologies exist and are being used in autonomous cars, they would need to be enhanced to provide the longer-range sensing and recognition capabilities required to deal with the multidirectional and convergence speeds associated with autonomous flight.

Using smartphone GPS navigational systems, apps provide information to autonomous road vehicles that a pedestrian is waiting to cross the road, and the location from which they will cross.

In a similar approach, on-board systems in flying vehicles could detect other air vehicles. This would allow smart flying vehicles to avoid a collision by flying around obstructions or, if it is a drone, by sending directions to the drone for it to move out of the flight path of the smart flying vehicle.

While artificial intelligence has allowed for rapid improvements in the automation of flying, it makes the vertical communications systems even more critical for collision avoidance.

Not too many collision avoidance communications systems have been significantly tested in functioning vehicles.

Further discussions, research and testing is required about what other applications AI should or will have with unmanned vehicles.

Safety is the core of any decision on communications architecture.

How will swarms of flying cars integrate into already busy commercial airspace, or the urban airspace?

New and unprecedented rules will need to be set that ensure flying vehicles are safe in their construction, safe in their movement through the sky and safe in the communication with other vehicles, central control and people. ■

Continued from page 18

Being a part of ITS Asia-Pacific, our ITS Asia-Pacific board member **Mohammed Hikmet** has played a significant role as an ambassador for the congress. Hikmet has been a long-standing ITS Asia-Pacific board member and past chair. He will be stepping down from the board and ITS NZ president **Stephen Hewett** (Beca Transport Advisory) will be fulfilling that role following the World Congress.

Next year's World Congress takes place in Los Angeles, October 4-8, 2020. Visit **www.itsworldcongress2020.com/** for more information.

Can't make it to the congress this year?

ITS New Zealand will be hosting review events following the World Congress in Auckland on November 12, Wellington on November 14, and Christchurch on November 19.

See **www.ITSNZ.org** for details.

T-Tech 2020 Dates

T-Tech 2020 is scheduled for May 4-5, 2020 in Wellington. Visit **ITSNZ.org** for updates. ■

WE'RE COMMITTING TO EVs

EVtalk checks out how some of the New Zealand companies are doing with their commitment to electrify at least 30% of their vehicle fleets by the end of 2019. Transpower New Zealand is among 30 of the country's employers to agree on the deal.

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Transpower
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Waste Management
Watercare
WEL networks
Westpac
Xero

The Mitsubishi Outlander PHEV is favoured by Transpower New Zealand

TRANSPOWER HITS FLEET EV TARGET

Switching 30% of its passenger vehicle fleet to electric has already been achieved by Transpower New Zealand, well within the expected time frame.

The national grid operator has 16 EVs among the 54 vehicles in its passenger fleet, while a further 40 vehicles are utes, minibuses and trucks.

Passenger vehicles are switched to EVs when the vehicles meet their replacement criteria, Transpower says.

It favours the Mitsubishi Outlander plug-in hybrid (PHEV) after trialling a number of EVs, and the company will continue to evaluate other models as they come on the market.

"Our assets are spread widely around the country and some are in remote locations," Transpower says.

"We needed an EV that had a long range, was AWD for light off-road travel, and was an SUV to carry three to four people including personal protective gear as well as being reasonably priced."

While Transpower is actively following the development of EV utes, it currently replaces its fleet with internal combustion engine (ICE) vehicles as it says nothing suitable is yet available in that EV field.

It intends replacing eight diesel passenger vehicles with EVs this financial year and switch all its remaining passenger vehicles to EVs when their replacement criteria is met.

Transpower vehicles are mainly located at its Auckland, Palmerston North, Wellington and Christchurch offices, and allocated to staff who regularly visit company sites, landowners and customers or are used as pool vehicles.

Concerns about range, vehicle cost and insufficient capacity on existing electrical boards at some locations have contributed to making the transition difficult in some instances.

But staff reaction to electrifying the fleet has been very positive, Transpower says.

"We have also noticed an increase in the number of staff who have purchased their own EVs. Staff with EVs can use our chargers for free."

Transpower has six EV chargers at its Auckland office and four in its Wellington office available to staff and visitors, with six more planned in Wellington later this financial year.

Four chargers were stationed in the Palmerston North office, but seismic issues meant that office had to recently relocate.

Six smart chargers are also being installed at the Christchurch office.

Keep up with NZ Electric Vehicle industry news

evtalk.co.nz/subscribe

WOMEN DRIVING CHANGE

Victoria Carter is a driver of change.

After a varied career (she has a law degree and has worked in marketing, public relations and politics) which included service on the boards of Turner's Auctions and Jucy Group, Carter holds to a "sustainable driving" belief after co-founding car sharing service Cityhop.


Victoria Carter

Although no longer serving on Cityhop (son **Ben Carter** is general manager), she never misses an opportunity to promote it and car sharing generally, saying it's good for cities and the planet.

Carter points to car sharing reducing car ownership globally, adding that each Cityhop car replaces nine to 15 privately owned vehicles which sit in carparks nearly 90% of the time, allowing space to be reclaimed for other transport modes.

She doesn't own a car – using Cityhop instead, often a Volkswagen e-Golf.

Cityhop introduced 25 new EVs to its fleet of more than 200 cars, about a quarter of them now hybrids or full EVs.

A key to car sharing, where you rent vehicles by the hour, is to change people's mindsets around car ownership, Carter says.

About 53% of Cityhop members delayed their next car purchase, sold their car or live without one. Many also use different transport forms, perhaps biking, scootering or using public transport.

"The average driver does about 8000km a year, but once there's no car in their garage they do much less, even about half that," Carter says.

Cityhop reckons its members drive about 2000km less every year.

Rates vary according to the vehicle, ranging from about $9.50 an hour to an e-Golf costing $15 an hour plus kilometres. Cityhop rates include parking, fuel, insurance, maintenance and cleaning.

That works out much cheaper than car ownership, Carter says. Many small businesses who drop off supplies once a week should look at vehicle sharing rather than owning a van, she adds.

Child seats and dog "hammocks" (stopping dog hair spreading around the car) are available too.

Cityhop cars all have names, and Carter has a Toyota Prius hybrid called "Vicky" named after her.

On her travels, Carter has seen car sharing work well in some other major cities, and she says Cityhop members' behavioural changes have resulted in more than a million kilograms of carbon dioxide savings each year.

Sustainability and climate change are close to Carter's heart, so she welcomes anything that can be done in transport to assist.

Recognised for her work, Carter was appointed an Officer of the New Zealand Order of Merit in 2016 for services to art, business and the community.

And transport minister **Phil Twyford** recently announced Carter as one of the new directors on the NZ Transport Agency Board.

Alana Hargadon is Auckland City Electric Vehicles (ACEV) office manager in Takapuna, Auckland, a family run business with husband **Hadley**, who has been involved in the automotive business most of his career.

Her job involves everything from marketing and social media to assisting with vehicle buying from Japan.

"The biggest highlight has been seeing our loyal customers follow us to our beautiful new 900sqm location, which we opened earlier this year," she says of the 83 Barry's Point Road showroom.

A daughter of **Allan Clarke**, who ran Allan Clarke Motors on the North Shore for many years and who remains closely involved with ACEV, Hargadon has a business degree majoring in marketing and finance.

Working in marketing for several years, she became involved in the fashion industry – those skills useful in the new showroom.

"I'm always following trends, whether cars or fashion, so I have been dressing the new showroom."

Hargadon says different colours make it look great.

A green growing wall helps and goes with ACEV's slogan "Switch to an EV today for a greener tomorrow".

An electric scooter is used for milk runs for coffee for staff and customers.

Hargadon says customer experience means everything to her. "So, seeing our lovely clients return to us for repeat business is very rewarding".

The couple got into EVs during a family dinner discussion. "We could see it was a good decision to import electric vehicles and we loved the feeling of driving them and making a difference to the environment and thought Aucklanders would too.

"My father Allan has been in the industry since the 1970s and has really enjoyed the transition to electric vehicles."

Hargadon drives a company BMW i3, charging at work or home.

"I save around $7k a year on fuel and at least $2000 on servicing over my old non-electric BMW," she says.

Victoria Carter and son Ben at Cityhop

EV promotions are among her favourite job aspects.

"We were thrilled to have taken part in the 'Leading the Charge road trip' when it stopped in Takapuna, our sales team invited the local community for a spin in our electric vehicles and being a Takapuna local I loved seeing everyone come together to experience an EV for

Continued on page 22

WOMEN DRIVING CHANGE

Continued from page 21

the first time. We are also a member of Drive Electric and will be attending EVworld NZ next year."

Hargadon says EVs benefit the local community and New Zealand's future, with more people considering an EV due to rising petrol prices.

"For a lot of customers the number one driver behind their decision is the saving from no longer needing petrol. Followed by the obvious sustainability factors."

Hargadon believes it's crucial to work together to raise awareness on climate change and to make the important changes in people's lives.

She says many customer employers are putting in chargers as an incentive for their employees to go electric.

ACEV encourages people to try an overnight test drive to see if the vehicle fits with their family and lifestyle.

Along with the BMW i3s they sell battery electric vehicles such as the Nissan Leaf (all, including the 40kWh) and Nissan e-NV200 van, along with plug-in hybrids such as the Mitsubishi Outlander and VW Golf GTE.

"The industry is moving so quickly towards being electric only," Hargadon says.


Alana Hargadon

"All the vehicle manufacturers are increasing EV output. The number releasing new EV-only models is incredible. In the next three to four years it will be very interesting to see the level of EVs on our roads."

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OUTLANDER STILL GREAT - BUT SHOWING AGE

I have driven the Mitsubishi Outlander PHEV so many times now that it is almost an old friend. And despite seven years on the market Mitsubishi continues to tweak and improve it.

And why wouldn't they. It is already the top-selling PHEV in the market, and continues to sell in reasonable volumes. Only the Leaf has converted more people to the electric lifestyle in New Zealand.

The latest update boosts the battery size, it is now a 13.8kWh lithium-ion unit over the old 12kWh one. In news *EVtalk* should probably ignore, the 2-litre four-cylinder petrol has been upsized to 2.4-litres.

Still, power to the wheels is usually provided by the two electric motors, with the petrol motor acting only as a generator. It can step in at higher speeds when it is considered efficient to do so.

Claimed range goes up from 54km to, (cough), 55km. Real world expect 35-40km, though keeping in mind the average NZ commute is 22km, that means many users manage mostly electric travel with the model.

A more powerful rear motor means power output is now up to a total of 130kW. Still, performance feels adequate rather than sporting, which suits this relatively tall and narrow family SUV.

Being this old means pricing and specifications have been sharpened to the point where even the battery Outlander is undercutting some petrol and diesel competitors.

An 8" Smartphone Link display audio system is now

standard across all models, featuring updated PHEV info screens. Dual-zone air-conditioner control units allow all passengers climate of choice, and the instrument panel button layout has been revised.

Both XLS and VRX models get driver assist systems like adaptive cruise control, lane keeping and autonomous emergency braking, while the XLS gets a sunroof, full-leather and a power tailgate.

The XLS is now $52,990 and the VRX $57,990.

The Outlander is practical, but its slab-like dash design and piano black finish is dating a little. The gauges show your

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Continued from page 23

power or region balance, and there is a centrally-mounted trip computer for showing your usage.

The front seats are very comfortable, with a soft cushion, yet enough side bolster to be supportive. The leather feels nice and thick. The rear seat offers good leg and headroom, although there is not enough width for three adults to be comfortable.

The boot is spacious - the PHEV lacks the third row of the petrol models - at 463 litres.

On the road, the Outlander feels much like any other SUV of its age, the steering is light, the ride is soft and comfortable, and there is body roll, though not to an uncomfortable level.

The electric drive feels particularly smooth, though you do need to drive a little gently to avoid kicking in the petrol motor. When it does, it revs high for efficiency, so declares its arrival with a buzzy note.

In 2017 the NZ-new Outlander joined import models with DC fast charging - though it comes with a catch.

While it is Chademo and technically 50kW capable, in reality the small capacity and comparatively low voltage means it is hardly rapid.

Chargenet indicated to us you are really only charging at around 16kW - better than the onboard charger and AC, but not enough to make extended distances of electric travel viable.

Still - and as I said earlier - the Outlander PHEV is a pretty appealing package. It offers a lot of specification for the money, and for most it offers just enough range to avoid the gas station in daily use. ■

POWER DEALS FOR EV USERS

Company	Energy Deals	Where	Cost to charge LEAF*
Meridian	**Electric Car Plan:** Super-low night rates from 9pm until 7am daily. Available for your entire home's electricity needs. Rates are fixed for 3 years. Plus get a year's worth of free EV charging on us! (bill credit of up to $300)	Auckland Wellington Christchurch	$4.91 $4.15 $2.82
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, 12% PPD is included in these calculations.	Auckland Wellington Christchurch	$5.75 $5.82 $5.63
Contact Energy	**Everyday Bonus Fixed:** Excellent night rates, no fixed term, check if the matching day-time kWh rate will affect your overall bill.	Auckland Wellington Christchurch	$5.57 $4.60 $3.28
Ecotricity	**Low Solar:** Low Usage plan for EVs & can buy back solar energy, no fixed term	Auckland Wellington Christchurch	$7.52 $5.93 $5.85
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	$6.82 $6.86 $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	$5.80 # $5.75 # $3.46 #
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	$6.81 $4.23 $3.73
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	$4.42 #

*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 and could increase your overall bill. 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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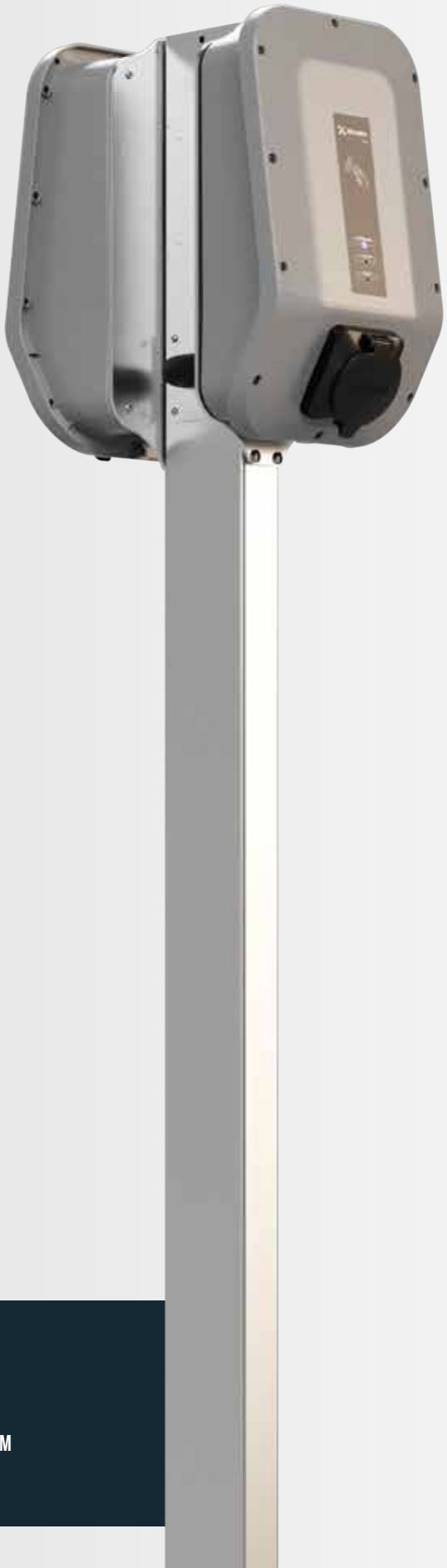

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OEM AUDIO BACKS EV MARKET

Paul O'Connor's OEM Audio supplies model ranges for new and used car dealerships throughout Australasia.


Paul O'Connor

OEM Audio makes cables for electric vehicles. It also produces type two and type one EV leads so owners can charge their EVs from a public station.

"It's rapidly becoming a popular product," O'Connor says. "With positive environmental, financial and convenience reasons, it's the obvious way forward."

Since 2016, OEM Audio have been supplying equipment for electric vehicles in New Zealand, Australia and the South Pacific.

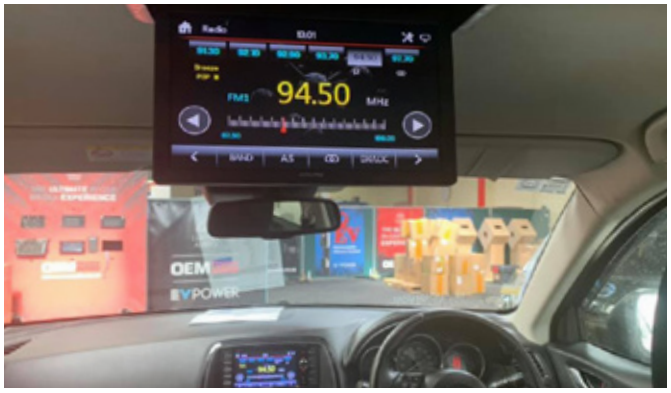
Over 50 used dealerships throughout New Zealand purchase OEM Audio EV equipment.

He says a lot of people are trying to enter the EV market but don't have any background. "They seem to think that anything will work, we have tried a lot of gear and some will burn your house down.

"All of our products are TUV approved, which is the most reputable testing organisation in the world. We spent the money to get TUV approved, and our products meet the latest International Electrotechnical Commission (IEC) standard. We are not some guy in his garage hoping for the best."

OEM have made a long-term commitment to the EV industry.

OEM Audio has a range of WallChargers coming, with some even having a Wifi app that allows you to see and set the time, speed, and kilowatt on the charge.



Around 75% of O'Connor's products go to car dealers, both new and used dealers, for different projects.

"There is a good trade allowance. The margin sold is good, even for its low retail price, there's a margin in the product."

The company is happy to deal with customers who call the 0508 free phone number. English manuals and YouTube channels are also available for the customer.

O'Connor says they are happy to take the customers' calls, so dealers don't have to handle all the queries.

In the next few days, dealers will be able to log in from the OEM Audio website and buy straight from there. Products will arrive the next day provided the order is done by 5.30pm that evening.

OEM Audio is supported by two technicians, **Kyle** and **Stu**, who O'Connor says are two of the best audio technicians in New Zealand.

To contact OEM Audio, free phone **0508 OEM AUDIO (0508 6362 8346)** or email **sales@oemaudio.co.nz**

EV BATTERY PROJECT NEEDS A CHARGE

Crowdfunding is sought to help a trial project aiming to upgrade the battery packs of older EVs.

Auckland company Blue Cars has been swapping and servicing EV batteries since 2016. In 2017 they launched a pilot project to trial the possibility of upgrading older battery packs here in New Zealand.

With co-funding from the Government's low emission vehicles contestable fund administered by the Energy Efficiency and Conservation Authority (EECA), the company was able to design, build and test a prototype replacement battery module for a Nissan Leaf.

"Our prototype module achieved 45% greater capacity than original Leaf modules and gave us the confidence to keep working towards a full upgrade solution," Blue Cars founder and managing director **Carl Barlev** says.

The small start-up company was unsuccessful in seeking further funding support but claims it has been able to keep the project moving at a slower pace by directing revenue from core activities selling and servicing EVs.

According to a new project page on the company's website, Blue Cars finished building its first full upgrade prototype in July 2019. The prototype fits 38kWh of new battery modules into an existing Leaf battery pack, giving 58% more capacity than original Leaf packs.

"We still have some technical issues to solve, but initial run-out tests have been promising with our test car achieving nearly 200km despite winter conditions and mostly highway driving," Barlev says.

"We believe we can increase this to 230km or more with some tweaking of the design and fine-tune balancing of the new battery modules. We're certainly pretty excited by results so far."

Carl Barlev outside Blue Cars' new shop at 3 Tahi Rd, Waiheke Island

Upgrade cost

"With no battery upgrade options presently available in New Zealand, our project represents the first real possibility of an affordable battery upgrade solution for local EV owners," Barlev says.

Replacement packs offered by Nissan in Australia at prices ranging from A$30,000-A$53,000 make the solution developed by Blue Cars seem like a much more reasonable option.

"Our upgrade solution has a target price around NZ$20,000 and that's for 50% more capacity than Nissan's like-for-like replacement offer," Barlev adds.

"At this price level we already have people interested in participating in the trial project we're hoping to launch early next year."

Fundraising campaign

Meanwhile, the company has received broad interest from EV owners around the country and the world.

The Givealittle fundraising page was launched to give existing Leaf owners and others a chance to help support the project.

"Money raised will help fund the trial, including testing dashboard integration solutions, endurance testing and proving of the full battery upgrade solution," Barlev says.

"We've set our fundraising target to match the level of co-funding we will need to contribute if our latest funding application is successful."

The fundraising campaign raised just over $4500 from around 40 donors in the first fortnight, with the average donation much higher than the company was expecting.

Maori broadcaster Thomas Curtis even offered a donation on air.

"With about 8000 used Nissan Leafs in New Zealand, we were hoping to get more support from these car owners in particular," Barlev says.

"If a quarter of these Leaf owners give even just $20 each we'll get to our target and hopefully also one step closer to co-funding from EECA in December.

"This is also helping train people to support the industry."

Trial project

Leaf owners keen to join the trial need to include details about their vehicle and will have to allow data to be collected from the updated battery pack, while also willing to deposit $3000 towards the target upgrade price of $20,000 (including GST).

"While expensive compared to an older Leaf with 100km range, our potential customers are those who see the value compared to a newer EV with similar range and costing $60,000 or more," Barlev explains.

Blue Cars is considering battery upgrades for second-hand Nissan eNV200 vans next year and is likely to study options for other EVs in the future.

Barlev says he founded Blue Cars to support EV uptake in New Zealand. The company launched NZ's first rental EVs in 2015 before opening the country's first specialist EV workshop.

Barlev is also a founding trustee of the Better NZ Trust.

Email **pilot@bluecars.nz** for more information. ■

BIG JUMP IN EV REGISTRATIONS

Electric vehicles have rocketed to 17,026 in the September Ministry of Transport figures.

That's nearly 1000 up on the previous month's 16,031.

The Tesla Model 3's arrival has had a big impact, increasing the number of new light pure electrics by nearly 500 to 3400.

EVtalk earlier reported the Model 3 had 359 units registered in September – making it the third most popular passenger vehicle here.

If the rate continues, it's possible New Zealand will have close to 20,000 EVs registered by the end of December.

That's nearing the 32,000 target set for the end of 2020 to achieve 64,000 EVs on our roads by the close of 2021.

Registrations of used light pure electrics also surged by 310 on August, up from 9134 to 9444 in September.

Plug-in hybrids (PHEVs) didn't fare quite so well but still climbed on the previous month with 2659 registrations recorded in the new light PHEV category – 106 up on August's 2553.

Used light PHEVs reached 1365 in September – up 71 on the 1294 registered in August.

Heavy EVs continue their slow progress, September's 158 registrations nine up on August's 149.

Auckland still tops the country on EV uptake with 7743 registrations by the October 3 MoT update – 452 up on August's 7291.

The city of EV sales was followed by Canterbury with 2465 EV registrations (328 more than August's 2337) and Wellington on 2183 – 120 more than August's 2063.


Martin Harwood


Henry Schmidt


Hayden Johnston

Meanwhile, the Government is continuing with progress on Clean Car Discount (feebate) and Clean Car Standard (emissions) proposals, with associate transport minister **Julie Anne Genter** hoping to have policies progressed by the end of this year.

Martin Harwood of Harwood Cars in Auckland says the buzz has been around the new EV market.

He says while sales of second-hand Nissan Leafs have generally been up and down, partly attributable to the school holidays; he expects next month to pick up.

"November has historically been the best month of the year for me."

Talking about the Government's Clean Car proposals and deferral of its fleet electrification, Harwood suggests the Government would be better off just letting the automotive industry "get on with what we're doing".

Henry Schmidt of Autolink Cars in Auckland says November is also usually a strong month for them too.

"We're not going too bad," he says of their second-hand EV sales, agreeing that much of the talk has been around the new EV market - especially the Tesla Model 3 with deliveries continuing apace.

"If you have what people are looking for then they will buy it," Schmidt adds while attending to buyers from Paraparaumu near Wellington.

Genuine Vehicle Group (GVI) general manager **Hayden Johnston** says the Tesla Model 3 certainly seems to have made up the numbers.

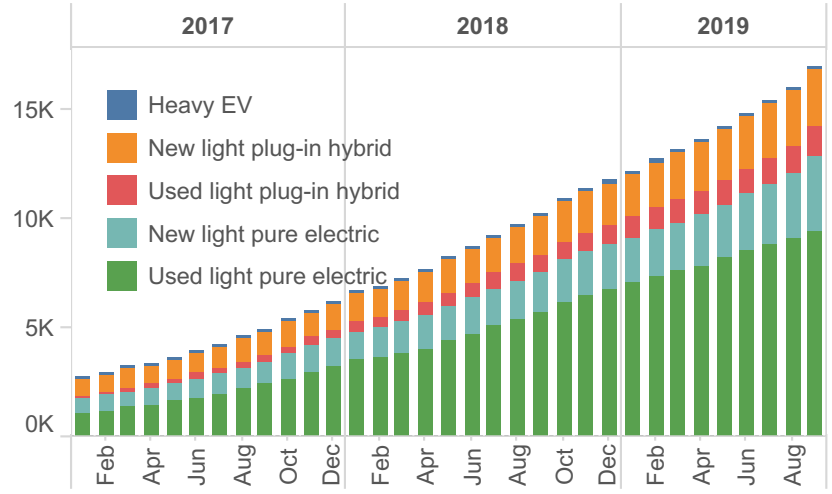
He says GVI's sales of second-hand EVs are continuing at a steady pace – "which is great, looking very positive".

While EV sales are consistent, the sales of internal combustion engine (ICE) vehicles can be up and down, Johnston says.

November is generally good for sales

Continued on page 29

EV fleet size



	2013	2014	2015	2016	2017	2018	2019
Jan	194	235	595	1,117	2,758	6,630	12,200
Feb	194	246	625	1,153	2,986	6,918	12,725
Mar	202	286	683	1,226	3,193	7,255	13,186
Apr	202	329	716	1,319	3,377	7,632	13,659
May	204	367	745	1,405	3,661	8,200	14,229
Jun	207	391	796	1,599	3,969	8,707	14,867
Jul	208	418	844	1,751	4,258	9,249	15,421
Aug	210	442	873	1,875	4,593	9,759	16,031
Sep	213	467	917	1,989	4,926	10,255	17,026
Oct	221	494	957	2,153	5,361	10,891	
Nov	226	527	1,002	2,374	5,840	11,380	
Dec	230	554	1,056	2,555	6,216	11,752	

TESLA TOPS THE CHARTS

The Tesla Model 3 has exceeded expectations with 359 sold in September, leading New Zealand's EV charge in new vehicles by a country mile.

That's put it 59 ahead of mid-September predictions about 300 would be delivered here during the month.

Year-to-date (YTD), the Model 3 sales figures put it at 419 – on both counts blitzing all other EV makes and models in the new vehicle sector.

Next up is the **Hyundai Kona EV SUV** with 56 sales in September and 323 YTD, followed by the Audi e-tron with 16 for the month and 74 for the year. The **Nissan Leaf** came in at 14 sales for September and 54 for the year, and the **Tesla Model X** with 13 and 72 respectively.

The third placed high-flier in terms of YTD sales is the **Hyundai Ioniq** with 125, but just six sold in September.

The **Kia e-Niro** clocked in at 65 YTD and eight for the month, very similar to the **Jaguar I-Pace** with 69 and eight respectively.

The **Volkswagen e-Golf** polled 99 YTD and seven for the month.

In the new plug-in hybrid

The Mitsubishi Outlander PHEV remains top of the hybrids

electric vehicle (PHEV) segment, the **Mitsubishi Outlander** continues to reign supreme with 59 sales for September and 372 YTD – streets ahead of the rest.

The **Mini Countryman PHEV** had 22 sales in September and 83 YTD, while the **Toyota Prius** checked in with 15 sales for the month and 86 YTD.

Over in the used car market, the **Nissan Leaf** has never faltered with 302 sales for September – 45 ahead of August's 257 - putting it at about 2551 YTD. Nissan was also next on the table with five **Nissan e-NV200** vans sold in September, 22 YTD.

Alan Clark

No surprises in the used vehicle PHEV sector either with the **Mitsubishi Outlander** again top of the table at 37 sales in September compared with 53 in August, and 350 YTD.

That's way ahead of the **Toyota Prius** on 19 for the month and 90 YTD.

Continued from page 28

for GVI, particularly from people who are partly prepared for the end of the season and "getting squared away", he adds.

Johnston says December can usually start quiet then gets "manic" in the second half of the month as people realise Christmas is fast approaching.

GVI is also increasingly winning tenders to supply companies' vehicle fleets with EVs, he says.

"Many companies are showing interest in EV uptake and we're starting to get traction."

Johnston says the demand for fleet EVs is not always for new vehicles with cheaper EVs also sought.

He's not holding his breath though in expectation that the Government will soon provide more incentives for EVs, particularly through its Clean Car proposals which advocate a feebate scheme and emission standards.

"Kiwis are on board the electric vehicle revolution and we're seeing a growing interest for EVs on Trade Me Motors," its head **Alan Clark** says.

"In September we saw a 15% jump in the number of views on EV listings when compared to last year.

"The number of watch-listed EVs is also climbing and rose 2.5% on September last year."

USED IMPORTS SEPTEMBER 2019

MAKE	MODEL	SEP'19	YTD'19
BEV - BATTERY ELECTRIC VEHICLE			
NISSAN	LEAF	302	2551
NISSAN	E-NV200	5	22
BMW	I3	2	21
MITSUBISHI	I-MIEV	1	8
MITSUBISHI	MINICAB	1	3
TESLA	MODEL S	1	7
	OTHER		41
Total		**312**	**2341**
PLUG IN HYBRID			
MITSUBISHI	OUTLANDER	37	299
TOYOTA	PRIUS	19	107
BMW	I3	8	58
BMW	530E	2	5
MERCEDES-BENZ	C350	2	6
VOLKSWAGEN	GOLF	2	11
BMW	330E	1	11
BMW	I8	1	3
BMW	M5	1	1
	OTHER		8
Total		**73**	**509**

NEW MAKES AND MODELS 2019

MAKE AND MODEL	SEP '19	TOTAL 2019
ELECTRIC		
TESLA MODEL 3	359	419
HYUNDAI KONA	56	323
AUDI E-TRON	16	74
NISSAN LEAF	14	54
TESLA MODEL X	13	72
KIA NIRO	8	65
JAGUAR I-PACE	8	69
TESLA MODEL S	7	48
VOLKSWAGEN GOLF	7	99
HYUNDAI IONIQ	6	125
ALEXANDER DENNIS ENVIRO 200	5	5
BMW I3	4	36
LDV EV80	2	13
RENAULT KANGOO	1	5
RENAULT ZOE	1	3
FACTORY BUILT YUTONG	0	1
FACTORY BUILT EV10	0	1
FUSO ECANTER	0	1
Total (Autobase)	**507**	**1413**
PLUG-IN HYBRID		
MITSUBISHI OUTLANDER	59	372
MINI COUNTRYMAN	22	83
TOYOTA PRIUS	15	86
HYUNDAI IONIQ	4	49
VOLVO XC60	3	14
BMW I3	1	22
AUDI A3	1	39
BMW X5	1	1
PORSCHE CAYENNE	0	17
LAND ROVER RANGE ROVER SPORT	0	12
KIA NIRO	0	8
VOLVO XC90	0	8
BMW 2 SERIES	0	4
LAND ROVER RANGE ROVER	0	3
PORSCHE PANAMERA	0	3
BMW 3 SERIES	0	2
BMW I	0	2
BMW 5 SERIES	0	1
MERCEDES-BENZ GLE	0	1
MERCEDES-BENZ S-CLASS	0	1
Total (Autobase)	**106**	**728**

PLUGGED IN!

Stay connected to the EV community with useful links below.

EECA	NZ government's EV information website **https://www.electricvehicles.govt.nz/**
Drive Electric	Advocacy group for the EV industry **https://driveelectric.org.nz/**
EV Association of Aotearoa	EV owners association **https://www.evaa.co.nz**
Charge Net	Nationwide EV charging network **https://charge.net.nz/**
Electric Heaven	NZ electric car guide **http://www.electricheaven.nz/**
NZ EV Podcast	Monthly podcast about EVs **https://www.podcasts.nz/nz-ev-podcast/**
Flip the Fleet	EV Community data sharing project **https://flipthefleet.org/**
NZ Electric Bikes Review	Independent electric bike reviews **https://electricbikesnz.com/**

EV OWNERS FACEBOOK GROUPS – ONLINE CHAT GROUP FOR THE NZ EV COMMUNITY

Nationwide	
NZ EV Owners	**https://www.facebook.com/groupsNZEVOwners**
Regional	
Auckland EV Owners	**https://www.facebook.com/groups/291373964545996/**
Wellington EV Owners	**https://www.facebook.com/groups/WellyEV/**
Waikato EV Owners	**https://www.facebook.com/groups/WaikatoEV/**
Dunedin EV Group	**https://www.facebook.com/groups/403816650002889/**
Christchurch EV Group	**https://www.facebook.com/groups/ChristchurchEVGroup/**
EV Owners - Manawatu	**https://www.facebook.com/groups/1847252468838484/**
Nelson Tasman EV Owners	**https://www.facebook.com/groups/365895557107117/**
Northland EV Group	**https://www.facebook.com/groups/northlandEVgroup/**
Bay of Plenty EV Owners	**https://www.facebook.com/groups/BayOfPlentyEVOwners/**
Central Otago Lakes EV Owners	**https://www.facebook.com/groups/521978908249518/**
Naki EV Owners Group	**https://www.facebook.com/groups/375210949597565/**
South Canterbury EV Owners	**https://www.facebook.com/groups/southcanterburyev/**
INVER-ELECTRIC-CARGILL	**https://www.facebook.com/groups/250609535293325/**

MITCH EVANS SIGNS LONG-TERM FOR FORMULA E


Mitch Evans


Simon Evans

Giltrap Group backed racing driver **Mitch Evans** has signed multi-year contracts to continue with Panasonic Jaguar Racing for season six and beyond in the ABB FIA Formula E Championship.

His teammate will be announced at the team's official launch for the new season on October 2, Evans, 25, partnering with Brit **Alex Lynn** in the latter part of last season after **Nelson Piquet Jnr** left six races in following performances below expectations.

Evans secured the British team's first Formula E win in Rome last year.

"I'm really happy to be staying with the team for a fourth season," he says.

"I have had a taste for victory driving for Panasonic Jaguar Racing, now all I want is more! The team is getting stronger and I feel at home here. I'm determined to push forward with Panasonic Jaguar Racing, building on last season's success as we hunt down more points, podiums and wins."

Evans has been working closely with the team to get the Jaguar I-Type 4 ready for the 15 races in 13 cities on the ABB FIA Formula E season six calendar which starts in Ad Diriyah in Saudi Arabia on November 22 and finishes on July 26 next year in London.

Panasonic Jaguar Racing Team director **James Barclay** says the team is delighted Evans has committed his future to them

"We have grown together in the last three seasons and developed into a winning team capable of fighting at the front of this highly competitive championship."

Evans' brother Simon, also supported by the Giltrap Group, returns for another season of racing in the Formula E support series the Jaguar I-Pace eTrophy, representing Team Asia New Zealand.

The Giltrap Group's involvement with the Evans brothers continues a long tradition of motorsport association.

Sir Colin Giltrap started it in the mid-1960s, not only driving in races but supporting young New Zealand racing drivers.

During the past 40 years, he has been attributed as the main driver of New Zealand talent, including **Larry Perkins**, **Denny Hulme**, **Danny Sullivan**, and more recently, **Jim Richards**, **Earl Bamber**, **Brendon Hartley**, **Mitch** and **Simon Evans**, and **Scott Dixon**.

EVS IN DRIVE TOWARDS BIGGER EMISSIONS REDUCTIONS

Electrified transport is touted among measures to combat climate change with a UN Climate Action Summit of world leaders in New York on September 23 proposing more ambitious targets.

Some 87 major companies are taking action to align their businesses with what scientists say is needed to limit the worst impacts of climate change, say the UN Global Compact, the Science Based Targets Initiative (SBTI) and We Mean Business coalition.

The companies - with a combined market capitalisation of more than US$2.3 trillion and annual direct emissions equivalent to 73 coal-fired power plants - collectively represent at least 4.2 million employees from 28 sectors and are headquartered in 27 countries.

They have committed to set climate targets across their operations and value chains aligned with limiting global temperature rise to 1.5°C above pre-industrial levels and reaching net-zero emissions by no later than 2050.

The latest cohort of companies include ADEC Innovations; América Móvil; ASICS Corporation; Bharti Airtel; City Developments; Croda International; EDP – Energias de Portugal; Electrolux; Ericsson Group; L'Oréal; Nestlé; Nokia; Novo Nordisk; NRG Energy; Ørsted; Scania; Schneider Electric; SkyPower and others.

Sixteen New Zealand companies are also committed to reducing emissions, many well on the road to increasing their EV fleets.

World leaders at the Climate Action Summit hosted by UN secretary-general **António Guterres** included New Zealand prime minister J**acinda Ardern** and United Kingdom prime minister **Boris Johnson**.


Dean Sheed

The summit allows governments, businesses and other stakeholders to present action plans aligned with the report by the Intergovernmental Panel on Climate Change (IPCC), which warned of catastrophic consequences should global warming exceed 1.5°C.

A group of 28 companies announced in July include Mahindra Group; Unilever; Vodafone Group and Zurich Insurance – Zurich hosting the NZ Motor Forum in Auckland on October 17 which includes EVs.

Audi NZ general manager and Drive Electric board member **Dean Sheed** will provide an EV update at the forum.

EV CHARGING LOCATIONS

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Fast / Super Charger Locations – North Island

Pukenui	Houhora Fishing Club, 4126 Far Nth Rd
Coopers Beach	Four Square, 9 Coopers Dr
Kaitaia	Te Ahu, 28 South Rd
Kaitaia	Pak'nSave, 111 North Rd
Kerikeri	1 Butler Rd
Opononi	Four Square, 29 SH12
Kaikohe	Library Carpark, 14 Marino Pl
Kawakawa	4 State Highway 1
Tikipunga	Paramount Plaza, 1 Wanaka St
Whangarei	11 Alexander St
Raumanga	McDonalds, 130 Tauroa St
Dargaville	Totara St Park, 113 Totara St
Kaiwaka	1 Kaiwaka-Mangawhai Rd
Warkworth	New World, 6 Percy St
Warkworth	BP, 67 Auckland Rd (SH1)
Orewa	New World, 11 Moana Ave
Silverdale	17 Hibiscus Coast Hwy
Albany	The Warehouse, 186 Don McKinnon Dr
Rosedale	McDonalds, 14 Constellation Dr
Kumeu	New World, 110 Main Rd
Henderson	Pak'n'Save, 224 Lincoln Rd
Akld CBD	Vector, 21 Hobson St
Beach Rd	Z Station, 150 Beach Rd
K Road	Tesla, 501 Karangahape Rd
Newmarket	1 Gillies Ave
Greenlane	McDonald's, 320 Gt Sth Rd
Pakuranga	BP, 322 Pakuranga Rd
Botany Downs	Z Station, 550 Te Irirangi Dr
Akld Airport	Shopping Ctr, George Bolt Mem. Dr
Akld Airport	Z Skyway, George Bolt Mem. Dr
Takanini	30 Walters Rd
Takanini	Pak'nSave, 345 Great South Road
Coromandel	44 Woolams Rd
Whitianga	4 Lee St
Tairua	Carpark, 6 Tokoroa Rd
Pukekohe	King Street Carpark, 56 King St
Pukekohe	Counties Power, 14 Glasgow Rd (Bus hrs)
Waiuku	Kitchener Rd Carpark
Thames	505 Mackay Street
Whangamata	100 Hetherington Road
Hampton Downs	Gate 1, Motorsport Park
Te Kauwhata	16 Wayside Rd
Waihi	New World 35 Kenny St
Huntly	Countdown, 18 Tumate Mahuta Dr
Morrinsville	New World, 79/89-97 Thames St
Te Rapa	WEL Networks, 114 Maui St
Rototuna	Countdown, 160 Peachgrove Rd
Matamata	New World, 45 Waharoa Rd
Hamilton	Tesla, The Base, Te Rapa Rd
Hamilton	Countdown, 551 Anglesea St
Claudelands	Coutdown, 160 Peachgrove Rd
Hamilton	Caro St Carpark, 7 Caro St
Hamilton	Countdown, 4 Bridge St
Ruakura	Waikato Innov. Pk, 9 Melody Ln
Raglan	43 Bow St
Mt Maunganui	Bayfair, 19 Girven Road
Mt Maunganui	New World, 1 Tweed St (25 kWh)
Cambridge	73 Queen Street
Pirongia	Four Square, 270 Crozier St
Te Awamutu	10 Scout Lane
Whakatane	i-Site, 30 Quay St
Opotiki	i-Site, 70 Bridge St
Te Kaha	Te Kaha Bch Res, 3 Hotel Rd
Te Araroa	22 Rata St (25 kWh)
Rotorua	1134 Haupapa St
Tokoroa	New World, 72 Bridge St
Matawai	6522 Matawai Rd
Tolaga Bay	43 Cook St (25kWh charger)
Te Kuiti	New World, 39 Rora St
Murupara	Pine Drive Car Park, Pine Dr
Taupo	Firestation, 1 Kaimanawa St
Taupo	Tesla, 1 Kaimanawa St
Gisborne	21 Gladstone Rd
Morere	Hot Pools, 3968 SH2 (25 kWh)
Rangitaiki	Lodge Café, 3281 SH5
Turangi	1 Pihanga Rd
New Plymouth	66 Courtenay St
Opunake	Business Centre, 23 Napier St
Wairoa	75 Queen St
Putorino	5466 State Highway 2
National Park	Four Square, 4354 SH4
Ohakune	New World, 30 Ayr St
Taihape	New World, 12 Huia St
Te Haroto	Mc Vicar Rd, 4237 SH5
Waiouru	Cnr SH1 & Hassett Dr
Hawera	Pak'nSave, 54 Princes St
Napier	206 Dickens St
Hastings	100 Queen St W
Mangaweka	Papa Cliff Café, 2 Koraenui St
Whanganui	Pak'nSave, 167 Glasgow St
Waipukurau	34 Russell St
Dannevirke	24B Gordon St
Woodville	i-SITE, 43 Vogel St
Palmerston Nth	i-SITE, 126 The Square
Palmerston Nth	Tesla, 365 Ferguson St
Levin	New World, 21 Bath St
Otaki	New World, 155-163 Main Hwy
Paraparaumu	Kapiti Pak'nSave, 132 Rimu Rd
Raumati	15 Raumati Rd, Paraparaumu
Paekakariki	7D Wellington Rd Paekakariki
Masterton	Queen Elizabeth Park, 3 Dixon St
Porirua	2 Serlby Pl
Featherston	SuperValue , 42 Fitzherbert St
Upper Hutt	24 Queen St
Lower Hutt	Dowse Art Museum, 1 Stevens Gr
Wellington	Grey St Parking
Petone	Z Station, 60 Hutt Rd
Te Aro	Z Station, 174 Vivian St
Te Aro	Barnett St Carpark, 11 Barnett St
Te Aro	Inglewood Parking, 68 Inglewood Pl

Fast / Super Charger Locations – South Island

Takaka	16 Willow St
Havelock	Four Square, 68 Main Rd
Motueka	New World, 271 High St
Karamea	Four Square, 103 Bridge St
Nelson	i-SITE, 81 Trafalgar St
Nelson	New World, 73 Vanguard St
Richmond	Library, 11 Mcglashen Ave
Spring Creek	2226 SH1, Blenheim 7202
Blenheim	Pak'nSave, Springlands
Ward	Flaxbourne Café, 7326 SH 1
Westport	New World, 244 Palmerston St
Reefton	Four Square (25 kWh) 47 Broadway
Greymouth	13 Tarapuhi Street
Kaikoura	51 West End
Kaikoura	New World, 124 Beach Road
Hokitika	New World, 116 Revell St
Culverden	27A Mountain View Rd
Amberley	Countdown, 123 Carters Rd
Rangiora	Pak'nSave, 2 Southbrook Rd,
Northwood	New World, 2 Mounter Ave
Harewood	Raeward Fresh, 800 Harewood Rd
Addington	Z Station, 40 Moorhouse Ave
Halswell	New World, 9 Nicholls Rd
Christchurch	Tesla, The George Hotel, 50 Park Tce
Rolleston	New World, 90 Rolleston Dr
Lincoln	New World, 77 Gerald St
Little River	4235A Christchurch Akaroa Rd
Rakaia	41 Bridge St
Ashburton	109 West St
Tekapo	Lake Tekapo Tavern, SH8
Fairlie	Opp. 53 Main St
Geraldine	Cox St Carpark, 14 Geraldine-Fairlie Hwy
Temuka	New World, 185 King St
Twizel	Events Ctr, 61 McKenzie Dr
Timaru	26A North St
Omarama	2 Sutherland Rd
Omarama	Tesla, Hot Tubs, 29 Omarama Ave
Kurow	Wynyard St
Wanaka	42 Ardmore St
Queenstown	Tesla, Remarkables Park Town
Frankton	Pak'nSave, 302 Hawthorn Dr
Cromwell	i-Site, 2 The Mall
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
Nth Dunedin	University of Otago, 71 St David St
Dunedin	Filleul St Carpark, 193 Moray Pl
Mosgiel	New World, 10 Hartstonge Ave
Milton	Four Square, 207 Union St
Roxborough	22 Jedburgh St
Lumsden	Four Square, 14 Diana 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

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